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# COLLECTED REPRINTS

...of...

THOMAS S. CULLEN

VOLUME II.

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BALTIMORE, 1916

As reprints seem to soon scatter and disappear I have had about fifty sets of my more recent articles bound for my friends.

In the list of contents it will be noted that some of the articles have been published in two different medical journals.

At the end of the volume is a fragmentary article on Endometritis. This was omitted from a former collection of reprints. Appended there is also the index of the papers contained in Volume I.

THOMAS S. CULLEN.

Johns Hopkins Hospital.  
May, 1916.

VOLUME II.

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- A Series of Mistaken Gynecologic Diagnoses:
- Case I—Diagnosis: Very large ovarian cyst. Actual condition: A partially parasitic uterine myoma, associated with 51 liters of ascitic fluid. Recovery.
- Case II—Diagnosis: Myomatous uterus. Actual condition: Adenocarcinoma of the body of the uterus, with secondary subperitoneal nodules.
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—*Jour. of the Amer. Med. Assoc.*, November 19, 1904.
- Vaginal Cysts.—*Transactions of the American Gyn. Society*, 1904; *Johns Hopkins Hospital Bulletin*, Vol. XVI, No. 171, June, 1905.
- Cysts of Bartholin's Glands.—*Jour. Amer. Med. Assoc.*, January 21, 1905.
- I. Fibroma of the Abdominal Wall.
- II. Primary Carcinoma of the Right Fallopian Tube.
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—*Johns Hopkins Hospital Bulletin*, Vol. XVI, No. 177, December, 1905.
- Large Carcinomatous Tumor of the Liver.—*Jour. Amer. Med. Assoc.*, April 22, 1905.
- Uterine Elevator Forceps.—*Jour. Amer. Med. Assoc.*, April 29, 1905.

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Case II—A very rapidly growing squamous-celled carcinoma of the inner side of the thigh.

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—*Johns Hopkins Hospital Bulletin*, Vol. XVII, No. 182, May, 1906.

A Series of Intestinal Anastomoses.—*Canadian Jour. of Medicine and Surgery*, Toronto, July, 1906.

Immediate Examination of Uterine Mucosa and Myomatous Nodules After Hysteromyectomy to Exclude Malignant Disease.—*Jour. Amer. Med. Assoc.*, March 10, 1906.

A Series of Interesting Gynecologic and Obstetric Cases:

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- Jour. of the Amer. Med. Assoc.*, May 4, 1907, Vol. XLVIII, pp. 1491-1497.
- Surgery of the Liver.—*Surgery, Gynecology and Obstetrics*, Vol. IV, No. 5, pp. 573-584, May, 1907.
- Parasitic Uterine Myomata.—*Jour. Amer. Med. Assoc.*, December 14, 1907, Vol. XLIX, pp. 1994-1998.
- Adenomyoma of the Uterus.—*Jour. Amer. Med. Assoc.*, January 11, 1908, Vol. L, pp. 107-115.
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- Some Points in the Operative Technique of Vaginal Hysterectomy for Prolapsus.—*Surgery, Gynecology and Obstetrics*, March, 1910, pp. 307-309.
- A Large Cystic Tumor Developing from the Iliopsoas Bursa.—*Jour. Amer. Med. Assoc.*, April 9, 1910, Vol. LIV, pp. 1181-1184.
- A Right Pelvic Kidney; Absence of the Left Kidney; Absence of the Uterus; Both Ovaries in the Inguinal Canals.—*Surgery, Gynecology and Obstetrics*, July, 1910, pp. 73-75.
- Carcinoma of the Right Fallopian Tube Readily Palpable Through the Abdomen.—*Johns Hopkins Hospital Bulletin*, Vol. XXII, No. 238, January, 1911; *Surgery, Gynecology and Obstetrics*, July, 1910, pp. 75-76.
- Surgical Diseases of the Umbilicus.—*Jour. Amer. Med. Assoc.*, February 11, 1911, Vol. LV1, pp. 391-396.
- A Malignant Intestinal Growth Requiring the Removal of An Unusual Number of Abdominal Structures.—*Surgery, Gynecology and Obstetrics*, July, 1911, pp. 76-78.
- An Extra-Abdominal Multilocular Ovarian Cyst.—*Jour. Amer. Med. Assoc.*, October 14, 1911, Vol. LVII, pp. 1251-1255.
- A Pseudohermaphrodite.—*Surgery, Gynecology and Obstetrics*, October, 1911, pp. 449-453.
- Umbilical Tumors Containing Uterine Mucosa or Remnants of Mueller's Duct.—*Trans. Southern Surgical and Gynecological Assoc.*, 1911; *Surgery, Gynecology and Obstetrics*, May, 1912, pp. 479-491.

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- The Radical Operation for Cancer of the Uterus.—*Surgery, Gynecology and Obstetrics*, March, 1913, pp. 265-272; *Trans. of the American Gynecological Society*, 1912.
- Operations on Patients with a Haemoglobin of Forty Per Cent. or Less.—*Surgery, Gynecology and Obstetrics*, September, 1913, pp. 276-294.
- Report of Cancer Campaign Committee.—*Surgery, Gynecology and Obstetrics*, November, 1913.
- Adenomyoma of the Rectovaginal Septum.—*Jour. Amer. Med. Assoc.*, March 14, 1914, Vol. LXII, pp. 835-839; *Trans. of the Southern Surgical and Gynecological Assoc.*, 1913.
- A Historical Sketch—The Church Home and Infirmary, Baltimore, Md., 1915.
- Unusual Cases Illustrating Points in Diagnosis and Treatment.—*Surgery, Gynecology and Obstetrics*, March, 1915, pp. 260-268.
- I. A Calcified Lymph-Gland Producing Symptoms Somewhat Suggestive of Gall-stones.
  - II. An Old and Infected Abdominal Pregnancy with Extension of the Long Bones Into the Bladder and Into the Bowel.
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  - V. Removal of a Large Tuberculous Cyst of the Mesentery of the Jejunum, Together with the Corresponding Segment of Bowel; Recovery; Later.—Death, Apparently from Tuberculous Meningitis.
- The Relation of Obstetrics, Gynecology and Abdominal Surgery to the Public Welfare.—*Jour. Amer. Med. Assoc.*, January 22, 1916, Vol. LXVI, pp. 239-243.
- Early Tuberculosis of the Cervix.—*Surgery, Gynecology and Obstetrics*, March, 1916, p. 261.
- Adenomyoma of the Round Ligament and Incarcerated Omentum in An Inguinal Hernia, Together Forming One Tumor.—*Surgery, Gynecology and Obstetrics*, March, 1916, pp. 258-260.
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*Tuberculous Stricture of the Ascending  
Colon, with Sudden Total Obstruction  
of the Bowel.*

*Perforation of the Intestine: Removal of the Cecum and  
Half the Ascending Colon: Recovery.*

BY

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FROM

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES,  
MARCH, 1904.

TUBERCULOUS STRICTURE OF THE ASCENDING COLON, WITH SUDDEN TOTAL OBSTRUCTION OF THE BOWEL; PERFORATION OF THE INTESTINE; REMOVAL OF THE CÆCUM AND HALF THE ASCENDING COLON; RECOVERY.

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THE careful and exhaustive articles bearing on lesions of this character that have already appeared render it superfluous for me to enter into a detailed consideration of the subject. Before describing the present case, therefore, I shall merely enumerate briefly the salient pathological and clinical features of the disease. Those wishing to study the subject fully are referred to the interesting articles of Henri Hartmann and Pilliet,<sup>1</sup> and Reclus,<sup>2</sup> in the French; of Hofmeister,<sup>3</sup> Adolf Hartmann,<sup>4</sup> and Gross,<sup>5</sup> in the German, and of Lartigau,<sup>6</sup> in this country. Hofmeister has tabulated all the cases he could find in the literature, and his consideration of the subject is most thorough, while Baumgarten, through his students, Hartmann and Gross, has contributed not a little to the pathological aspect of this disease. The works of Lartigau and Hofmeister should be carefully read by all particularly interested in this class of cases.

Tuberculous ulceration of the intestine is relatively frequent, as evidenced by the findings at autopsy, but stricture of the lumen of the bowel following as a result of this condition is somewhat rare. Hofmeister says that Eisenhardt, in 1000 autopsies on tuberculous patients, found intestinal lesions 566 times. In only 9, however, was there a more or less definite stricture of the bowel.

Tuberculous strictures of the bowel are usually single and situated at the ileo-cæcal valve. The cæcum is converted into a sausage-shaped mass, which is adherent, as a rule, posteriorly and occasionally laterally. The omentum, although at times adherent to the

<sup>1</sup> Note sur une variété de typhlite tuberculeuse simulant les cancers de la région, *Bull. de la Soc. anat. de Paris*, 1891, vol. lxxvi, p. 471.

<sup>2</sup> Typhlite et appendicite tuberculeuses, *Cliniques Chirurgicales de la Pitié*, 1894, p. 217.

<sup>3</sup> Ueber multiple Darmstenosen tuberkulösen Ursprungs, *Beiträge zur klinischen Chirurgie*, 1896, Bd. xvii, S. 577.

<sup>4</sup> Ein Fall von tuberkulöser Darmstenose, *Inaug. Diss.*, Tübingen, 1897.

<sup>5</sup> Ueber Stricturnrende Darmtuberkulose, *Inaug. Diss.*, Tübingen, 1901.

<sup>6</sup> *Journal of Experimental Medicine*, 1901, vol. vi, p. 23.



growth, is not as prone to engraft itself on the tumor as in cases in which appendicitis exists. The outer surface, while relatively smooth, may be studded by a few tubercles. At one point the gut shows a constriction, and usually around this the adipose tissue is very dense. Where the cæcum is cut into the mucosa frequently shows considerable alteration. It is sometimes studded with irregular or serpiginous tuberculous ulcers, while the intervening mucous membrane is the seat of a chronic inflammatory process. At the point of stricture the lumen of the gut is so narrow that the tip of the finger can hardly be introduced. In some cases so small is the calibre of the bowel that a sound is passed with difficulty, and in our case a small bird-shot was sufficient to completely occlude the canal. The degree of alteration in the cæcum varies with the individual case, and it is only necessary for the reader to picture the tuberculous process advancing until the cæcum becomes matted and densely adherent to all the neighboring structures, and, in rare instances, the process gradually involves the abdominal wall until finally there is a fistulous opening on the surface. Even in the early stages the mesenteric glands are enlarged and already involved in the tuberculous process, and where the cæcal invasion is apparently in its incipency there may be caseation of these glands.

Tuberculous stenoses of the gut, when multiple, are almost invariably situated in the ileum. Anywhere from one to twelve strictures have been noted in the same patient. In one case Hofmeister found twelve strictures scattered over a distance of about seven feet of gut. The bowel between the strictures is frequently distended, and in rare cases has been known to reach 17 cm. in circumference. Lartigau draws especial attention to a group of these cases, in which, associated with the tuberculous process, there is a marked diffuse thickening of the bowel wall, which occasionally reaches 1 cm. or more in thickness.

The appendix is usually adherent, but, except where the tuberculosis of the cæcum is far advanced, shows no implication in the specific process. Our case proved no exception to the rule. Although bound down by adhesions, the appendix was otherwise normal.

**HISTOLOGICAL PICTURE.** In sections from the cæcum the edges of the ulcers may show tuberculous tissue, but, as a rule, epithelioid cells or typical tubercles are wanting, and nothing but granulation tissue can be made out. In the vicinity of the muscle, however, groups of epithelioid cells, and now and then tubercles, are seen. The peritoneal surface is usually free from tuberculous nodules until the disease is far advanced or unless the cæcal lesion has been associated with tuberculous peritonitis. Sections from the stricture are composed entirely of connective tissue; sometimes with, at other times without areas even slightly suggestive of tuberculosis. The adipose tissue surrounding the gut at the point of stricture is much infiltrated with small round cells, rendering the fat exceedingly

nor as in cases in which while relatively one point the gut the adipose tissue mucosa frequently added with intervening mucous process. At the point that the tip of the process is the difficulty, and in places completely occlude the lumen. The process becomes matted together, and in places the mucosal wall until even in the early stages is apparently involved in the process. The process is apparently glandular.

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where the tuberculation in the rule. Although otherwise normal. The edges of the caecum the edges of the rule, epithelioid; but granulation muscle, however, tubercles, are seen. Tuberculous nodules. A lesion has been found from the stricture. The process is much fat exceedingly

hard and firm. Sections from the lymph glands in the region of the caecum almost invariably yield typical tubercles.

Naturally the tuberculosis gradually extends to the muscle and outer coats of the bowel. The farther away the process extends from the lumen of the bowel, the more characteristic will be the specific lesions, since the inflammatory changes produced by the intestinal bacteria have less opportunity of masking the tubercles. The diffuse thickening or "chronic hyperplastic tuberculosis" of the intestine yields a very different picture to that of simple tuberculosis, as has been clearly pointed out by Henri Hartmann, Lartigau, and others. In these cases the tuberculous process has been relegated entirely to the background, while the mucosa and muscle have been overrun with round cells. Intestinal bacteria have doubtless gained entrance to the walls through the tuberculous lesions and have continually kept up a chronic inflammation of the bowel wall so widespread in character that the tuberculosis is entirely overshadowed. At a few points, however, it will still be demonstrable, and can be detected with certainty in the mesenteric lymph glands. Even in the caecal wall, when the typical lesions are totally wanting, tubercle bacilli can still be readily demonstrated.

**CLINICAL HISTORY.** Patients presenting tuberculosis of the caecum are usually between twenty and thirty years of age. The condition, however, may be found in the very young, and has been noted in persons fairly advanced in years. Quite commonly the patient has suffered from an old tuberculous process in the lungs or has a suspicious family history. In many of the cases which have come to autopsy healed lesions in the lungs have been demonstrated, while in a few instances there has been swelling of the cervical, axillary, or other lymph glands coincident with the caecal lesion. One of the first symptoms is constipation. After a time dull or sharp pain is felt in the appendiceal region. As the constriction develops there may be an intermittent diarrhoea, with the gradual narrowing of the bowel, and fullness may be noted over the caecum. Where there is much infiltration of the intestinal wall the gut becomes very firm and feels like a sausage-shaped tumor. With the gradual growth of tuberculous tissue and narrowing of the bowel symptoms of obstruction manifest themselves, as evidenced by abdominal distention, colicky pain, marked peristalsis, vomiting, and rapid loss in weight.

But although these symptoms may be present, in some instances definite indications of the presence of the lesions may be entirely absent. In our case the patient felt well until the day before operation, complaining only of slight discomfort near the appendix.

**DIAGNOSIS.** With the increased attention paid to caecal tuberculosis the possibilities of overlooking these lesions will be lessened. It was only a few days after our case was operated upon that Dr. Finney saw a patient giving symptoms sufficiently suggestive of a tuberculous lesion in the caecum to render such a diagnosis justifi-

able. At operation the cæcum was found to be the seat of a most extensive tuberculous ulceration. Fortunately, it was found possible to excise the whole of the diseased area.

Given a tumor in the right iliac fossa of slow growth, a clinical history pointing to a previous pulmonary tuberculosis, and a comparative absence of temperature, it is highly probable that tuberculosis is present. If a patient be fairly well advanced in years, of course, the possibility of a malignant growth must be considered. As pointed out by Hartmann, Lartigau, and other authorities, tuberculosis of the cæcum, especially of the hyperplastic form, has often been taken for sarcoma. This has been due to the massive infiltration with small round cells. But provided that we remember that they form a definite infiltration, instead of one or more large foci, and further, that the cells are uniform in size instead of being large and small and actively dividing, confusion is not likely to occur.

The gross diagnosis between tuberculosis and carcinoma of the cæcum may offer numerous difficulties, but on microscopic examination no confusion can exist, as in the tuberculous process the epithelial elements play an entirely passive rôle or have disappeared. Moreover, the demonstration of the tubercle bacilli is generally easy.

The diagnosis between cæcal tuberculosis and appendicitis is usually dependent on the tuberculous history and the slow growth of the tumor, together with the absence of a temperature suggestive of a pus accumulation. Of course, in a case similar to the present one, a differential diagnosis would be absolutely impossible.

**TREATMENT.** If tuberculosis of the cæcum be diagnosed early operation is indicated. Resection of the entire diseased area is, of course, necessary for an absolute cure. Lateral anastomosis between the ileum and ascending colon is the ideal operation. If after resecting the diseased portion of the gut very little mobility be obtainable, in order to avoid tension an end-to-end anastomosis is the only alternative. Where there are numerous strictures scattered over an area of several feet of gut, the question arises as to whether the entire diseased area be excised or several anastomoses be made, removing only the diseased segments and leaving the intervening normal gut. If the span of gut involved by the tuberculous process be not over three or four feet, it is wiser to remove this portion in its entirety. In one of the cases reported between six and seven feet were removed, and the patient recovered. With the diseased cæcum it is always necessary to carefully examine the glands of the mesentery, and if they be involved, they too should be excised. The results from resection have been very gratifying, Hofmeister in his table of 83 operative cases showing a recovery of 62 per cent.

*Tuberculous stricture of the ascending colon, with sudden total obstruction of the bowel; perforation of the intestine; removal of the cæcum and half the ascending colon. Recovery.*—The following is

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taken from my case-book, November 29, 1902: At 11 P.M. I saw, in consultation with Dr. Charles E. Simon, Miss K. G., aged twenty-four years. The day before she had indefinite pains in the region of the appendix. They were, however, not very severe and lasted but a short time. To-day she did her work as usual and prepared supper, but shortly afterward was taken with severe pain in the right side and was forced to go to bed. At 9 P.M. Dr. Simon saw her. There was marked rigidity of the right rectus over the appendiceal region. There was little temperature. On examination of the blood Dr. Simon noted that all eosinophiles had disappeared and that there was an evident leukocytosis.<sup>1</sup> When I saw her two hours later the rigidity of the right side had in part disappeared, probably as she was slightly under the influence of morphine. The general condition was good; pulse full and regular. Nevertheless, I advised immediate operation.

At 1.30 A.M. the abdomen was opened and a thin, watery pus immediately escaped from the peritoneal cavity, and the pelvis was found to be completely filled with pus. The intestinal loops, however, on the whole, presented a fairly normal appearance. Here and there they were covered by a few flakes of fibrin. The appendix was easily recognized and was bound down by adhesions. It was tied off from tip to base. As the distal extremity appeared to be normal, we expected to find a perforation near the cæcum, but on complete removal of the appendix it was found that, apart from adhesions, no alteration was present. After removing the pus from the abdomen a sponge was passed into the right renal pocket to see if any pus was there, and, to our surprise, some dark fluid escaped. This was entirely different from that found in the pelvis. The abdominal incision was continued upward to the ribs, and we immediately saw a perforation, about 4 mm. in diameter, in the ascending colon. As there was a good deal of fluid escaping, I temporarily closed this fistulous opening with a purse-string suture. I then drew the ascending colon out and made a longitudinal incision, and on introducing the finger into the colon found total obstruction a short distance above the ileocecal valve. The lower third of the ascending colon, the cæcum, and a small portion of the ileum were tied off and removed, together with some enlarged glands in the mesocolon. The ascending colon and ileum were then united by end-to-end anastomosis. Lateral union would have been preferable, but we had no choice, as the tissues would have been on too great a tension. A Connell suture was employed for two-thirds the circumference of the gut, the remaining third being turned in with rectangular mattress sutures. The entire line of suture was reinforced by running mattress sutures. The pelvis was carefully sponged out, the intestinal

<sup>1</sup> Simon lays much stress on the frequent absence of eosinophiles where pus is accumulating, and thinks that this sign is of more practical value than the degree of leukocytosis.

loops brought up into the abdomen, and the entire pelvis loosely packed with iodoform gauze.<sup>1</sup>

A gauze drain was also left at the site of the anastomosis. The patient stood the operation well. Her pulse did not rise above 100. The outlook, however, was not particularly flattering, considering the fact that there was a commencing peritonitis and also considerable œdema of the intestinal wall. Eight days after operation, on removing the last of the gauze, some fecal matter was found on the dressing. The fistula gradually closed, and the patient made an excellent recovery.

*February 12, 1904.* The patient has been at work for several months, performing general household duties without the slightest inconvenience. Her general condition is excellent. From her I learned that she had had typhoid (?) fever six years previously and was in bed for two weeks. For the last year she has had cramp-like pains throughout the abdomen two or three times a month, and recently the bowels have been more constipated than usual. She gives no history whatever of injury or bruising of the abdomen. For about a week before her admission to the hospital she had had intermittent abdominal pain. From the family history we were unable to get any data suggestive of hereditary tuberculosis.

**PATHOLOGICAL REPORT.** (Gynecological Pathological No. 6316.) The specimen consists of a small portion of the ileum, of the cœcum, and of about one-half of the ascending colon. The mucosa of the ileum is unaltered, that of the cœcum in most places is normal, but at a point directly opposite the ileocecal valve is a perforation 5 mm. in diameter (Fig. 1). The walls of the perforation are rather smooth and the surrounding mucosa, over an area 1 cm. in diameter, is somewhat thickened. The ascending colon, about 5 cm. above the perforation, shows a marked constriction. At this point the lumen narrows down until it is not more than 2 mm. in diameter. Indeed, so small is it that a fine bird-shot would lodge and completely plug the canal at this point (Fig. 2). The intestinal wall at the point of constriction varies from 5 mm. to 8 mm. in thickness and is exceedingly firm in consistence. The constriction is 1 cm. in length and the ascending colon above this point is unaltered.

*Histological Examination.* The appendix, beyond showing a few adhesions on its outer surface, is normal. The cœcum in the vicinity of the perforation has entirely lost its glandular elements, the specimen consisting almost entirely of granulation tissue. The underlying muscle shows a varying amount of small round-celled infiltra-

<sup>1</sup> For several years, where the pelvis has been filled with free pus, I have made it a practice, after having wiped the pelvis and intestines off, to place the patient for a moment in the Trendelenburg posture. The pelvis has then been loosely but fully packed with gauze, the ends of which are brought out through the appendix incision. My object has been to prevent the intestinal loops from dropping down and becoming adherent or kinked in the pelvis. In my hands this procedure has yielded very gratifying results. The loops, although still liable to become adherent, are on a level and are not nearly so prone to become obstructed.

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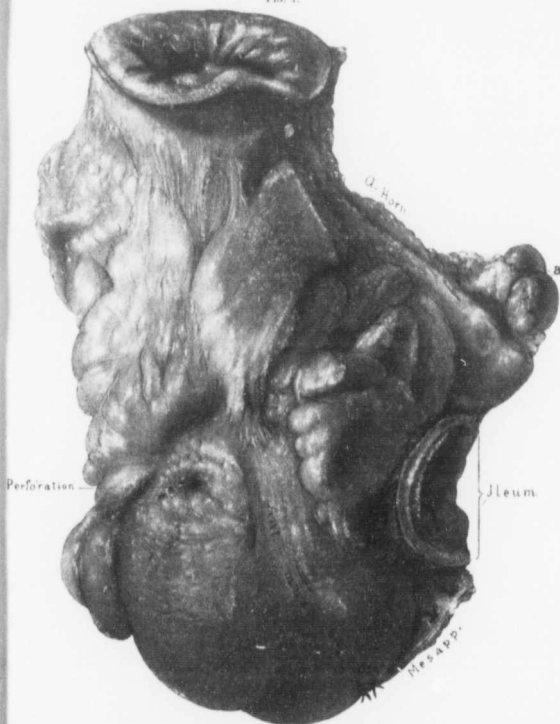
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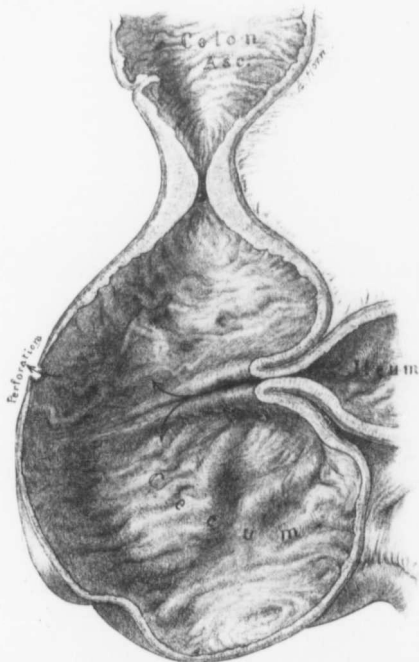
FIG. 1.



Tuberculosis of the caecum with perforation (natural size). Above is a cross-section of the ascending colon. Below and to the right the ileum. At a point directly opposite the ileum is a perforation of the caecum, and just above the perforation the adipose tissue is thickened and there is a constriction of the gut. At a are two enlarged and tuberculous lymph glands. For the interior view of the specimen, see Fig. 2.

tion tissue, and the underlying muscle is everywhere infiltrated by small round cells. The ulceration is evidently an old process, as nowhere is a very acute inflammatory reaction present. The

FIG. 2.



Tuberculous stricture of the ascending colon with perforation of the cecum. Directly opposite the ileocecal valve is a small perforation with slightly ragged edges. A short distance above this point the intestinal walls grow thicker and then form an annular constriction. The lumen of the ascending colon at the stricture has been so narrowed that a small bird-shot, when introduced, lodged therein and completely plugged the gut.

walls of the stricture are, to a great extent, composed of fibrous tissue. Here and there we have some light areas somewhat suggestive of tuberculosis. No giant cells are, however, demonstrable.

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Several mesenteric glands were removed with the intestine. Some of these reached 1.5 cm. in diameter. On histological examination these show typical tubercles, some sections of which contain four or five giant cells. The tuberculous process in the lymph glands has here and there advanced to caseation.

The following points merit attention in this case:

1. The total absence of definite symptoms until a few hours before operation.
2. The presence of symptoms identical with those of acute appendicitis.
3. Marked contraction of the stricture.
4. The advisability of always exploring the right renal pocket in all cases in which there is free purulent fluid in the pelvis.

As seen from the history, the patient had practically no symptoms until about five hours before operation, and then there was moderate pain over the appendix, accompanied by rigidity of the right rectus.

Examination of the blood showed a total absence of eosinophiles. The only way in which we can account for the lack of symptoms is that for some reason there occurred an acute contraction of the stricture, which, up to this time, had permitted the free passage of feces. The possible existence of such a condition supplies another indication for early operation whenever trouble exists in the appendiceal region. Already peritonitis had developed, although the symptoms had existed for so short a time; and had we delayed until morning there would have been little chance of saving the patient.

After having removed the appendix and wiped the pus from the pelvis, the abdominal cavity appeared normal, and I probably should not have explored the right renal pocket had I not been familiar with the renal work of Max Broedel, who has shown clearly that where there is a free accumulation of fluid in the region of the appendix that by gravity it will travel down into the right renal fossa.

I should have preferred lateral anastomosis, but we were forced to make an end-to-end union on account of tension.



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**UTERINE HAEMORRHAGES  
AND THEIR CAUSE.**  
  
**THOMAS S. CULLEN, M.D.,**  
 Baltimore.  
  
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 Reprint from August number, Vol. XVII.  
  
**ANNALS OF GYNECOLOGY AND PEDIATRY**  
  
 Boston, 1904

## UTERINE HAEMORRHAGES AND THEIR CAUSE.\*

THOMAS S. CULLEN, M.D.

Associate Professor of Gynecology, The Johns Hopkins Hospital,  
Baltimore.

General practitioners are continually meeting with cases of uterine haemorrhage and are often at a loss to determine the exact cause of the flow. In recent years we have gained a much clearer insight into the various pathological conditions that may cause uterine bleeding. Our knowledge has been due chiefly to two factors, early operation where pelvic lesions are present and a careful microscopical examination of all tissues removed at operation.

I shall, in the brief period at my disposal, look upon the subject from the standpoint of the general practitioner and see just what clues have been furnished by the pathologist and surgeon.

On making a list of the chief sources of uterine haemorrhage I have found that they fall into five main groups:

- (1) Haemorrhages dependent upon constitutional tendency to bleed.
- (2) Haemorrhages due to inflammatory conditions of the uterus or appendages.
- (3) Haemorrhages incident to pregnancy, extra—or intra-uterine.
- (4) Haemorrhages due to the presence of tumors.
- (5) Haemorrhage due to carcinoma or sarcoma of the uterus.

Haemorrhages may be present shortly after birth. Here within twenty-four hours after the child is born small balls of mucus mixed with blood may escape from the vagina. These usually disappear after the fifth or sixth day and do not return. We do not know their cause. Again, in young girls, the menstrual period is often very irregular, sometimes not coming on for months at a time and then amounting almost to flooding. In such cases it is often difficult to determine whether we are dealing with a period or with an intra-menstrual haemorrhage.

*Haemorrhages dependent upon a constitutional tendency.*  
Nearly all of you are familiar with a few cases of this kind. We

\*Address delivered before the Maritime Medical Association at Halifax, N. S., July 6, 1904.

have to deal with a young woman, dark in complexion and complaining of flooding at the menstrual periods. On questioning her closely it is frequently found that her parents or other members of the immediate family show a marked tendency to bleed after slight injuries or if the patient is of middle age she has had an alarming post-partum haemorrhage with each child. On examining such an individual nothing abnormal will usually be detected in pelvic organs and the microscopical examination of the uterine mucosa will show that it is apparently normal. In such cases we are dealing with a peculiar tendency toward bleeding and as there is a normal escape of blood from the uterus at each menstrual period the haemorrhage naturally takes place from the endometrium instead of from another part of the body.

Several years ago my attention was called to another group of cases unassociated with a general tendency toward haemorrhage. These patients commenced to have very profuse menstrual haemorrhages when about twenty years of age and the haemorrhage was so alarming that it was necessary to curette every three or four months. On microscopical examination I found hypertrophy of the tissue between the uterine glands. Otherwise the mucosa was normal. This haemorrhagic tendency disappeared about the thirtieth year in the cases with which I am familiar. Dr. H. Meek of London, had two patients, sisters, giving similar symptoms and in each after systematic curettage every four months for a number of years the cure was permanent. Under this group we may possibly include haemorrhage due to dilated veins in the endometrium. Here, however, the general tendency toward haemorrhage is wanting. I have in mind a patient suffering from severe haemorrhage and a diagnosis of cancer of the body of the uterus was made and hysterectomy contemplated. As a matter of precaution, however, curettings were examined and markedly dilated veins were found in the mucosa. The glands were perfectly normal. After several curettings the patient had no further trouble. Why the veins become so distended it is difficult to surmise but such conditions are occasionally present.

The tendency toward uterine haemorrhage is often in evidence where the uterine mucosa is moderately thickened and the glands enlarged and dilated. Given a scraping from such a case one

can say with almost absolute certainty that the patient is suffering from uterine haemorrhage.

*Haemorrhages due to inflammatory conditions of the uterus or appendages.* The physician not infrequently sees a patient who gives a history of an old miscarriage followed by some elevation of temperature or giving a fairly distinct history of gonorrhoea. On making a pelvic examination the uterus is found to be normal in size. Its mobility is slightly restricted and there is a faint suspicion that the tubes and ovaries are bound down. The patient complains of a leucorrhoeal discharge and of frequent and slight uterine haemorrhages. In such cases the physician is at a loss to know the exact cause of the bleeding and cancer may be suspected. If the diagnosis cannot be made then, the safest plan will be to curette and examine the scrapings. Much care should, however, be exercised as manipulation of the uterus may rekindle an old inflammation and pelvic peritonitis result. Examination of the scrapings in such a case will show a varying degree of endometritis but absolutely no evidence of cancer. If the pelvic adhesions be severed, and the uterus freed, these haemorrhages usually disappear. They may of course be much aggravated if a polypoid endometritis exist or if there be double pus tubes. It must be remembered that pelvic inflammatory lesions are by no means always accompanied by uterine haemorrhages.

*Haemorrhages incident to pregnancy.* Under this heading I refer to four important pathological conditions: (1) Miscarriage; (2) hydatidiform mole; (3) chorio-epithelioma; (4) tubal pregnancy.

*Miscarriage.* It is hardly necessary for me to more than mention this condition. In the first place it is so frequently met with and then as a rule the history is clear. There are cases, however, where the data are insufficient and where the patient denies pregnancy. Such cases are often confusing. I have had a patient come, saying that three weeks before consulting me she had had a miscarriage, and yet on careful questioning and after making a pelvic examination, I felt sure that she was suffering from a tubal pregnancy. In all cases where doubt exists, examination of the uterine contents will give a clue. If the pregnancy be intra-uterine then the scrapings will yield placental villi either

well preserved or at least retaining their outlines. The presence of the villi is proof positive of the intra-uterine pregnancy. If the foetus has escaped, the placenta usually remains, but if this has been expelled, small fragments are then found and we have the typical decidual formation still clearly visible and showing evidence of inflammation.

*Hydatidiform moles.* These are not very common. The patient has given a history of conception and then after a few months when movement is locked for none is detected and frequently there is a bloody discharge, often somewhat like brick dust. The uterus is globular and elastic, the cervix hard and the breasts diminished in size. Were one not cognizant of the facts, the diagnosis of a globular myomatous uterus might readily be made—in fact, I reported a case two years ago where we were almost sure that the growth was a myoma until after examination under ether. This disease is due to a cystic degeneration of the placental villi. These cystic villi with their secondary branches roughly look like bunches of grapes. On curetting large quantities of small cysts escape. They do not resemble anything else—so the diagnosis is certain. All these cases should be carefully watched as malignant changes are peculiarly prone to follow and may in fact have commenced and engrafted themselves on to the uterus prior to the expulsion of the mole. If uterine haemorrhages recur within a few weeks or months after removal of the mole a careful vaginal examination should be made at once to see if any uterine nodules exist and uterine scrapings should be made to determine definitely if any malignant growth be present.

*Chorioepithelioma.* This is a disease, until recent years, unknown. It never occurs except after pregnancy and is due to a malignant change in the placenta and possibly in the decidua. It may follow a simple miscarriage or an apparently normal labor, but is very frequent after a hydatidiform mole. It has in a few instances developed subsequent to a tubal pregnancy. Given a recent pregnancy, miscarriage or mole followed in a few weeks or months by copious uterine haemorrhages, we must immediately suspect chorioepithelioma or as it is frequently termed deciduoma malignum. On examining the uterus it is usually found enlarged and may be nodular, while in the vagina a bright

red nodular growth which readily bleeds is often detected. This is a secondary growth. In a certain number of cases both ovaries are converted into multiple corpus luteum cysts which completely block the pelvis. The uterine growth is peculiarly prone to give rise to lung metastases. These soon lead to pulmonary haemorrhages. If chorioepithelioma be suspected, microscopical examination of the uterine mucosa should usually indicate clearly whether the disease is present or not. If it exists, immediate and complete hysterectomy is the only chance. The delay of a day may prove fatal as metastases occur so rapidly.

*Tubal pregnancy.* To Lawson Tait we owe so much for our knowledge of this subject. A few years ago the history and course of the disease was little known. Now it is upon as firm and scientific a basis as appendicitis—indeed, so proficient have some practitioners become that the diagnosis is frequently made before the tube has ruptured. Although the disease is supposed to be comparatively rare, I have seen and operated upon six cases within one month. Given a patient who has always been regular, with sudden suppression of the period, followed in a few days or weeks by a faint bloody discharge, and possibly, a little pain on one or the other side of the uterus, we must at once suspect a tubal pregnancy and will not often be mistaken. Sometimes the period has come on at the regular time and yet as it were, dragged along for weeks only to be followed by sudden rupture of the tube with the usual signs of collapse due to internal haemorrhage. Whenever the menstrual period is suggestive of tubal pregnancy and a satisfactory pelvic examination is impossible on account of abdominal rigidity, then an ether examination should at once be made, as little force as possible being used as the tube may rupture. In every case where the diagnosis of tubal pregnancy seems definite the abdomen should be opened at once and the tube removed. Before rupture its removal is easy and fraught with little danger. After rupture the loss of blood may be so alarming that operation is out of the question or if the pelvis be filled with old clots there is considerable danger of intestinal obstruction or of a faecal fistula developing. Uterine haemorrhages accompanying tubal pregnancy are most suggestive and the entire picture is as a rule, not more difficult. A certain number of cases of pelvic peritonitis, however, present symptoms that closely mimic tubal pregnancy.

*Haemorrhages due to the presence of uterine tumors.*

*Myomata.* The most common uterine tumors are the myomata. With their various situations and size you are familiar. Doubtless many of you have wondered why in some cases the haemorrhage was very slight or entirely wanting even though the tumor was very large, while on the other hand, although the nodule was small alarming bleeding occurred. The amount of haemorrhage depends almost entirely upon the location of the tumor. If it be subperitoneal or interstitial and does not encroach upon the uterine mucosa, then we will have little bleeding, but if it projects into the uterine cavity, then there will almost certainly be severe haemorrhage—in fact, a submucous myoma not over an inch in diameter is sometimes accompanied by such severe flooding that the patient's life is in jeopardy. While a subperitoneal tumor of sixty pounds' weight may not be accompanied by any bleeding whatsoever and only cause discomfort by its size and by pressing upon the pelvic vessels and nerves. In all cases of myoma with haemorrhage we must remember the possible co-existence of adeno-carcinoma of the body of the uterus as I have noted the combination in a goodly number of cases.

*Sarcomatous degeneration of myomata.* During the last five years I have paid particular attention to malignant changes in myomata. These are invariably of a sarcomatous nature. Several cases have come under observation. The older writers spoke of recurrent fibroids. In these cases at frequent intervals submucous myomatous looking tumors were expelled. On histological examination it was found that quite a number of them were sarcomatous in character. The sarcomata develop in the myomata. If a myoma be subperitoneal then the malignant process soon extends to the intestines and surrounding structures. If interstitial, then secondary nodules are prone to develop in the uterine wall and may project into the cavity of the uterus. If a sarcoma develops in a submucous myoma, then portions will, from time to time, be forced out of the uterus. Given a myoma that has remained dormant for years and that commences to grow rapidly immediate and total hysterectomy is imperative. In myoma cases with haemorrhage the diagnosis is comparatively easy, as we have an enlarged and usually nodular uterus to give us the clue. We must, however, always remember the possible co-existence of sarcoma or carcinoma.

*Sarcoma of the uterus.* Sarcoma of the uterus is relatively rare, and cannot, clinically, be easily differentiated from cancer.



Although occasionally present in the cervix, it usually commences in the body of the uterus and while showing a tendency to bleed, the haemorrhage is usually not so severe as is noted with cancer. The exact diagnosis is only of interest to the pathologist as it cannot be clearly established, except on histological examination and further as the treatment of cases of sarcoma and carcinoma is identical—namely, complete abdominal hysterectomy.

*Adeno-myoma of the uterus.* This occurs in about 2 per cent. of all myoma cases and is usually accompanied by free uterine haemorrhages. The inner uterine walls are converted into a coarse-textured diffuse myomatous tissue and the uterine mucosa flows into the chinks between muscle bundles. At each menstrual period this mucosa between muscle bundles naturally swells up and on account of the increased tension thus produced gives rise to much uterine pain and at the same time it pours its quota of menstrual blood. This added to the normal amount given off by the uterine mucosa causes profuse haemorrhage. As the uterine mucosa itself is normal scrapings will give us no clue. The condition while very interesting to the clinician can only be diagnosed after removal of the uterus. I have examined over twenty cases of this character at the Johns Hopkins Hospital.

*Cancer of the Uterus.* We now come to the most frequent and dreaded cause of uterine haemorrhage—cancer of the uterus. The mucous membrane of the uterus is of three varieties—that of the vaginal portion of the cervix which closely resembles skin, that lining the cervical canal consisting of branching glands and secreting mucus and that lining the uterine cavity, consisting of tubular glands. From each of these three varieties of mucosa different forms of cancer may develop.

Cancer of the outer or vaginal portion of the cervix may roughly resemble a cauliflower growth. It bleeds so easily on account of the great number of blood vessels it contains and the various blood vessels have so little support that the merest touch is sufficient to rub the tops and free oozing follows.

Adeno-carcinoma of the cervix or the variety from the cervical canal consists of glands which penetrate in all directions and may grow entirely through the cervix but giving rise to much bleeding.

Cancer of the body of the uterus also consists of glands. It forms tree-like growths in the uterine cavity and also penetrates the uterine walls.

While cancer of the uterus may develop in early life it is most common after the thirty-fifth year. Whenever there is a uterine haemorrhage that cannot be accounted for, the uterus should be most carefully examined to see if there be any signs of cancer as it is only in the early stages of the growth that a cure may be hoped for. If the cervix be especially hard at any one point or show little prickly-like points that bleed easily then a wedge about a quarter of an inch broad and half an inch in depth should be cut out, put in alcohol or formalin and sent at once to the pathologist for examination. If the cervix be normal, then the body and cervical canal should be thoroughly curetted on all sides and the scrapings sent to the pathologist. The mucous membrane in health as seen under the microscope is just as different from that of cancer as are two totally different patterns of wall paper.

Much has been said about the treatment of cancer of the uterus and great improvements inaugurated in the operative technique. As has been pointed out elsewhere the only hope lies in the early diagnosis by the family physician. Unfortunately in a good many cases there are few, if any, signs of cancer until the disease is far advanced and operation out of the question. As a typical example I may mention a lady 69 years of age whom I saw in consultation in St. Louis less than two weeks ago. Her first haemorrhage occurred within a month of the time she came for operation and yet on vaginal examination the entire cervix was involved and the left broad ligament fixed by growth. I fully believe that in the near future the prediction of Dr. Kelly and others will be verified—namely, that every woman will present herself for examination at least three or four times yearly. In this way if any growth be present it will be gotten at in its incipency. Our first duty as physicians is to educate women as to the absolute necessity of having any irregularity of menstruation or any uterine haemorrhages carefully investigated at once. When they learn the seriousness of delay and the satisfactory results that may be obtained by prompt attention many more will be saved.

In the short time at my disposal no attempt has been made to enter much into detail. I have given you nothing new but have endeavored to merely group the various cases of uterine haemorrhage in such a manner that they can be easily understood.

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FRANK H. COBB, M.D.

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THE SECTION ON OBSTETRICS AND DIS-  
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THOMAS S. CULLEN, M.B.  
Baltimore.

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A SERIES OF MISTAKEN GYNECOLOGIC  
DIAGNOSES.

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THOMAS S. CULLEN, M.B.  
BALTIMORE.

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While it is advisable to chronicle our successes in diagnosis and treatment, I think it is equally necessary for us occasionally to look back and see where we have failed to make an accurate diagnosis before operation, or to critically review our judgment in a given case to ascertain if, in a subsequent and similar case, we could not do better.

From a perusal of the literature one is often led to believe that the exact nature of abdominal tumors is easily determined before operation. While this is undoubtedly true in the greater number of cases, yet it is well to remember that in a goodly number of instances, before operation, it is only possible to determine that the operation is necessary, the exact nature of the malady only being ascertainable when the abdomen is opened. From the accompanying group of cases, which I report in detail, the surgeon who does not always make a positive diagnosis before operation, or the one who may perchance render an erroneous opinion, will possibly derive a certain amount of comfort.

**CASE 1.**—*Diagnosis:* Very large ovarian cyst. *Actual condition:* A partially parasitic uterine myoma, associated with 51 liters of ascitic fluid. (Fig. 1.) *Recovery.*

*Patient.*—Woman, aged 54, unmarried, was admitted to the Church Home, Oct. 29, 1902, complaining of marked abdominal enlargement.

*Examination.*—Her face presented a drawn, pinched appearance, and she was very thin. The abdomen was tremendously

and uniformly distended. From the pubes to the sternum in the mid line there was dullness, in both flanks tympany, and on percussion a very distinct wave of fluctuation was easily detected. A diagnosis of ovarian cyst was made, and after a delay of a few days, on account of a slight bronchitis, the abdomen was opened.

*Operation.*—We found the peritoneum much thickened. The great distension was due to ascitic fluid. Attached to the fundus by a very small pedicle was a myomatous nodule 16 cm. long (Fig. 1). Plunging into the upper or free surface of this nodule were a large number of blood vessels, each about 3 or 4 mm. in diameter, tortuous and closely resembling angle worms. On tracing them upward they proved to be the enlarged omental vessels. The omentum as such was recognized as a fringe not more than 5 mm. long, projecting from the lower edge of the transverse colon. The altered omental vessels were exceedingly friable and ruptured on the slightest manipulation. The parasitic myoma derived part of its blood supply from the bladder, to which it had become intimately attached. After tying off the blood supply of the myoma, this growth was removed and the patient made a rapid recovery.

In this case I had to rely entirely on the physical signs, as the patient was of unsound mind, and up to the day of operation no history could be obtained. The facial expression and the abdominal signs tallied in every particular with those referable to an ovarian cyst, and without the clinical history a correct diagnosis was impossible. The tympany in the flanks is, on first thought, difficult of explanation, but when we remember that this myoma with the omental vessels attached stretched almost the entire length of the abdomen, it is readily seen that the small intestines were held back and at the same time forced out laterally. Under any circumstance there would have been dullness over the entire anterior abdomen, as the intestines, even if not held back by the tumor and omental vessels, could not have reached the surface, their mesentery not being long enough. I know of no instance in the literature where such a large quantity of ascitic fluid was associated with a myoma. The condition in this case was analogous to that found where a fibroma of the ovary exists. In the latter we have a solid tumor so moving that there is

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often partial torsion of the vessels bringing about the  
 outflow of ascitic fluid. In our case the myoma rolled  
 around so much that the omental vessels were partially  
 twisted. This was undoubtedly the case, as is shown by  
 the fact that there has been no further appearance of the  
 ascitic fluid since removal of the myoma. Had this pa-  
 tient been in the possession of her mental faculties the  
 diagnosis would have been fairly certain, as the family  
 physician told me at the time of operation that he had  
 first noticed a hard abdominal tumor attached to the  
 uterus and that the ascites had developed subsequently.

Schwarzenbach<sup>1</sup> reports a most interesting case. The  
 patient was 30 years old and the mother of six children.  
 In 1896 she had a pelvic hematocele, with pronounced  
 symptoms of internal hemorrhage. In 1897 a subperi-  
 toneal myoma the size of a child's head was detected. In  
 1899 she gave birth to a child, and in 1901 an explora-  
 tory abdominal section was made. Numerous arteries  
 and veins springing in the vicinity of the stomach lay  
 perfectly free in the abdomen, and passing downward  
 spread out on the surface of the subperitoneal uterine tu-  
 mor. Considerable ascitic fluid was present in the ab-  
 domen. The abdomen was closed, as the growth was  
 thought to be malignant. The patient improved, and in  
 1902 the abdomen was again opened. The omentum,  
 which at the first operation showed marked atrophy, had  
 now entirely disappeared. The patient was two months  
 pregnant. The large vessels were tied and the myoma  
 was removed. The pregnancy was in no way disturbed.  
 All trace of the pelvic hematocele had disappeared ex-  
 cept for the presence of some pelvic adhesions.

It seems quite probable that the hematocele in this  
 case was due to rupture of one of the omental vessels  
 instead of to the rupture of a tubal pregnancy. This  
 case has many points in common with ours.

1. E. Schwarzenbach: *Eigenthümliche Entartung des an einem Uterusmyom adhärenten Netzes*, Beiträge zur Geburtshilfe und Gyn. Rudolf Chrobak. Aus Anlass seines sechszigsten Geburtstages. Gewidmet von seltenen Schülern und Freunden, vol. I, p. 220.

CASE 2.—Diagnosis: Myomatous uterus. Actual condition: Adenocarcinoma of the body of the uterus, with secondary subperitoneal nodules. (Fig. 2.)

*Patient*.—Mrs. C., aged 59, was admitted to the Johns Hopkins Hospital, April 22, 1903. She had had three children. Menses stopped at 49. Four years ago uterine hemorrhages commenced and lasted several months. Since then they have

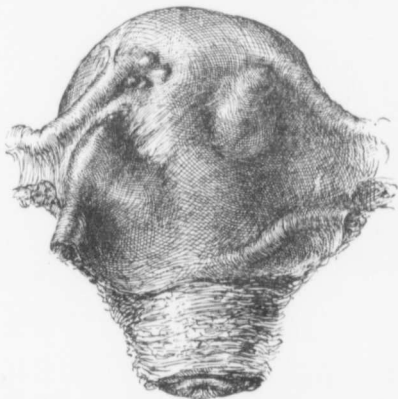


FIG. 2.—ADENOCARCINOMA OF THE BODY OF THE UTERUS WITH SUBPERITONEAL NODULES.

The specimen is viewed from the front. The right round ligament is drawn upward by a cancerous nodule situated at its junction with the uterus. Scattered over the surface of the uterus are cancerous nodules varying from a pea to a marble in size. The insertion of the left round ligament is at a much lower level than is that of the right round ligament. The general contour of the enlarged and nodular uterus closely resembles that of a myomatous organ.

been irregular. There is a continual leucorrheal discharge with some odor.

*Examination and Diagnosis*.—On vaginal examination we found the uterus about twice the natural size. It was quite nodular. As the patient was in good condition and had a nodular uterus which in general contour corresponded closely with a myomatous uterus (Fig. 2), we made a diagnosis of myoma, especially as the hemorrhages could readily be accounted for by



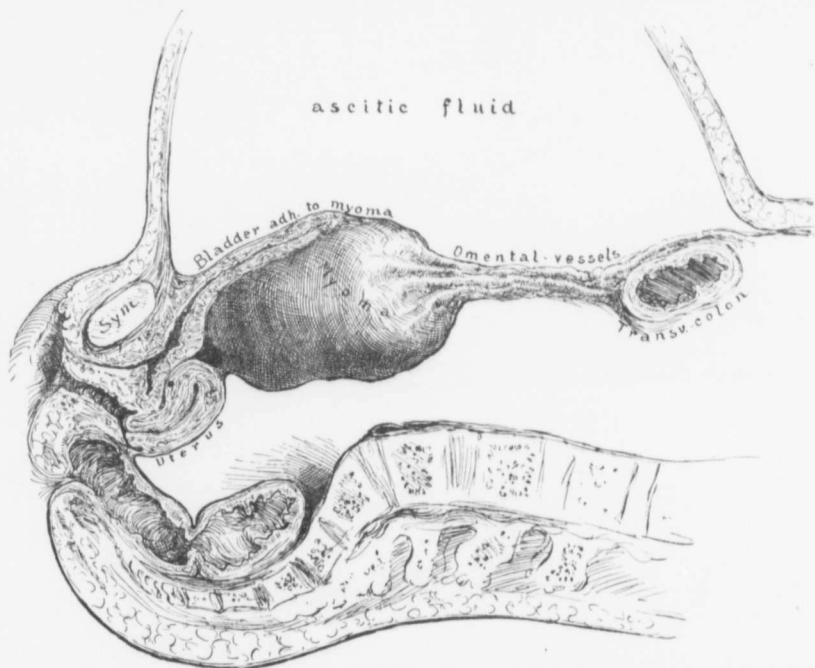


FIG. 1.—A PARTIALLY PARASITIC UTERINE MYOMA ASSOCIATED WITH 51 LITERS OF ASCITIC FLUID.

Attached to the fundus by a narrow pedicle is a subperitoneal myoma. Plunging into the top of the myoma are the omental vessels. The omental fat has almost entirely disappeared. The myoma is intimately blended with the posterior surface of the bladder. The abdomen is markedly distended with ascitic fluid. The small intestine was effectually held back by the tumor and omental vessels.

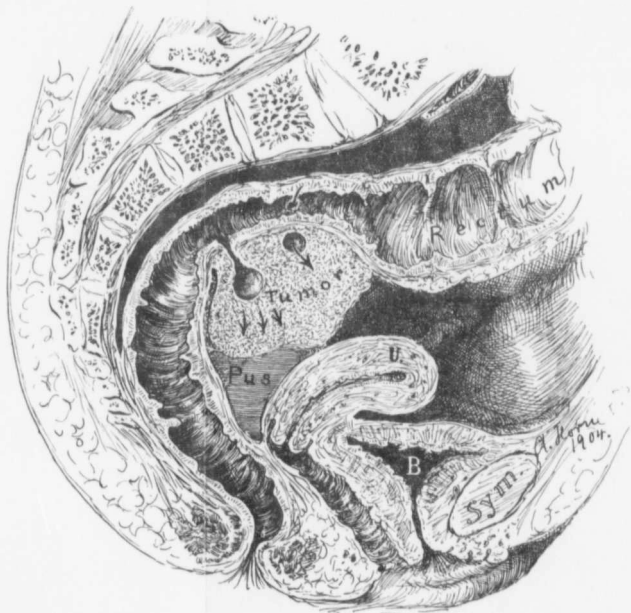


FIG. 3.—TUMOR OF THE SIGMOID FLEXURE DUE TO RUPTURE OF DIVERTICULA INTO THE SURROUNDING ADIPOSE TISSUE. SMALL PELVIC ABSCESS.

The lumen of the bowel below the promontory of the sacrum is considerably narrowed. At this point is a definite tumor made up of adipose tissue. Projecting into it are two diverticula, one seen in longitudinal, the other in cross section. At the point indicated by the three arrows the diverticulum has given way and its contents have percolated through fat. This fat on histological examination showed evidence of acute and chronic inflammation, thus accounting for the denseness of the tumor. Between the tumor and the pelvic floor is a small abscess.

the presence of myomata and since the vaginal discharge was but slightly offensive.

*Operation.*—At operation we found the uterus as I have described, but the nodules that were supposedly myomata were at points at which the cancer of the body of the uterus had extended to the surface. Here they formed raised nodules beneath the surface and at several places had become attached to the intestines. Complete hysterectomy was performed. The patient made a temporary recovery, but it is doubtful if the entire growth was removed.

In this case mere curettage, even without a microscopic examination, would have been sufficient to establish the diagnosis. But in cases where myoma is diagnosed and hysterectomy advised, we hardly deem it necessary or wise to curette.

*CASE 3.*—*Diagnosis:* Subperitoneal and intraligamentary myomata. Actual condition: Hydrosalpinx, adenocarcinoma of the right ovary, involvement of the small bowel and marked extension to the bladder.

Hysterectomy, partial removal of the cancerous growth, resection of a portion of the small bowel; temporary recovery.

*History.*—On Jan. 25, 1904, I saw the patient, who was 48 years of age. Her menstrual periods continued regularly until she was 44. Since then the flow has appeared every three or four months, and there has been a slight vaginal discharge. Two years ago she passed a calculus, apparently from the left kidney.

*Examination.*—On vaginal examination I found the uterus half as large again as normal. Projecting from the fundus on the right side, and very prominent, was what appeared to be a subperitoneal myoma about 5 cm. in diameter. The right side of the pelvis was filled by a growth which apparently sprang from the uterus and filled the broad ligament. This growth in contour and consistence resembled a myoma.

*Operation.*—On opening the abdomen (February 2) I found the uterus moderately enlarged. The supposed subperitoneal myoma proved to be a very tense hydrosalpinx which was kinked forward, thus accounting for its prominence. The growth on the right side was a carcinoma of the ovary. It filled the broad ligament and had infiltrated the bladder wall. Attached to the cancerous mass was the omentum and a loop of small gut. As the gut at this point was markedly constricted, I attempted by gentle dissection to release it, but the bowel was so infiltrated by cancer that it commenced to tear and resection of a portion was imperative. It was decided that the only hope of even temporary relief would be hysterectomy with as thorough removal of the growth as possible. This was done, but a raw, green, offensive, cancerous area, fully 6 cm. in



SE TISSUE. SMALL PELVIC

a definite tumor made up  
of fat on histological exam-  
ination. Between the tumor and

diameter, remained attached to the surface of the bladder. Three inches of the bowel were then resected and the ends united by means of the Connell suture, supplemented by the Lembert suture. The anastomosed bowel was then placed among healthy loops of gut as far removed from the necrotic area as feasible. The pelvis was drained through the vagina and abdomen. The patient recovered promptly, but naturally still has a small abdominal sinus. We have employed a retention catheter continuously, as even its temporary removal was promptly followed by the signs of ascending renal infection. The patient is now<sup>2</sup> in fairly good condition and has been entirely relieved of abdominal distension and cramps, to which she was subjected for some time prior to the operation.

In this case the clearly outlined subperitoneal nodule associated with the growth on the right side gave us a clinical picture very characteristic of multiple myoma, and this diagnosis was further strengthened by the healthy appearance of the patient. Some may doubt the wisdom of attempting any operative procedure in these cases, but in the liberation of the constricted and friable intestinal loop the bowel was opened, and then the more radical procedure seemed to offer the best chance of temporarily relieving the patient. In this case an absolute diagnosis would have been impossible without opening the abdomen.

*CASE 4.*—*Diagnosis:* Pelvic abscess, with retroverted myomatous uterus. *Actual condition:* Rectal diverticula, with rupture into the surrounding rectal fat, producing a definite tumor. Small abscess between the tumor and the pelvic floor. (Fig. 3.)

*History.*—This patient was seen early in February, 1904. She was 60 years of age. For some time she had experienced slight difficulty in defecation, and for a few days had been running a temperature varying from 100 to 103° F.

*Examination.*—On vaginal examination, I found the uterus somewhat enlarged. Posterior to it, and apparently continuous with it, was a globular mass. This was very hard and resembled a myoma in contour. There was, however, a hard ridge over its lower portion, as is so often noted where pelvic abscess exists.

*Operation.*—On February 13 I made a small incision in the vaginal vault just posterior to the cervix, and after peeling back the mucosa entered Douglas' pouch with a pair of blunt

ce of the bladder. cted and the ends pplemented by the was then placed l from the necrotic through the vagina ptly, but naturally employed a retenary removal was ng renal infection. a and has been en- l cramps, to which he operation.

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small incision in the , and after peeling ith a pair of blunt

artery forceps. A very small amount of pus and a few flakes of fibrin escaped, but the mass was in no way diminished in size. Realizing the presence of an unusual condition, I packed the opening in the vault and immediately entered the abdomen from above. Filling Douglas' sac almost completely was a tumor mass evidently springing from the sigmoid flexure, which had rotated 90° and had become firmly embedded in the pelvis. It closely resembled a rectal cancer. On careful manipulation it was brought out of the pelvis, and on inspection no lymph glands were demonstrable. The diseased segment of gut was removed and an end-to-end anastomosis done with Connell and Lambert sutures, the former being employed at the mesenteric junction and for about two-thirds the circumference of the gut. A portion of the descending colon was brought up into a small incision in the left inguinal region and made fast, so that if occasion demanded it could be opened with a thermocautery at a moment's notice. Drains were then introduced into the vagina and also through the lower angle of the abdominal incision. At the end of the fourth day there was considerable abdominal distension and the patient was very weak. We accordingly opened the descending colon at its point of attachment to the abdominal wall and at the same time forced the patient's nourishment. She promptly recovered. The small fistulous opening was a few weeks later readily closed under local anesthesia, and the patient is now perfectly well.

*Examination of Tumor.*—On laying the tumor open we found that there were two rectal diverticula passing out into the adipose tissues, and communicating with the lumen of the gut by openings not more than 1 mm. in diameter (Fig. 3). The larger diverticulum was 1 cm. in diameter and filled with a fecal mass. The floor of this diverticulum had given way, and the surrounding fat was everywhere infiltrated by inflammatory products. The excessive hardness of the tumor was due to the fat being in many places replaced by recent connective tissue. The small abscess between the tumor and the pelvic floor was due to the extension of the inflammatory process to the peritoneum of Douglas' pouch. The diverticula were lined by atrophic mucosa. A rectal examination of this case would have yielded little beyond some narrowing of the lumen of the bowel, which is often present in cases of pelvic abscess. In this case cancer of the bowel might very readily have been diagnosed and a colostomy made.

It will be readily admitted that the preceding cases are unusual ones, and that a positive diagnosis before operation would have been extremely difficult. The possibility of such conditions should always be borne in mind when we are dealing with cases that at first sight seem

so easy of diagnosis. While it is always very gratifying to be able to make an absolute diagnosis, yet in many cases it is only possible for us to give a tentative opinion before operation. In this group of cases, notwithstanding our inability to solve the riddle prior to operation, the outcome was as satisfactory as we could have anticipated under the existing circumstances.

# VAGINAL CYSTS

BY

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BALTIMORE

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*From the*  
*Transactions of the American Gynecological Society*  
1904

## VAGINAL CYSTS.

BY THOMAS S. CULLEN, M.B.,  
*Baltimore.*

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VAGINAL cysts have long been recognized and accorded a very thorough consideration. Among the more important contributions on this subject are the articles of Breisky, v. Winckel, Freund, Veit, Stokes, Gebhard and Bandler. In vol. vii of the *Johns Hopkins Hospital Reports* Ernest Stokes gave a careful résumé of the literature and reported 11 cases. Since that time many new specimens have been received so that the total number examined at the hospital, including those reported by my colleague, Stokes, amounted to 53 on January 1, 1904. In order to facilitate a satisfactory consideration of the subject it may be well to speak briefly of (1) the gross and histologic anatomy of the normal vagina; (2) the embryonic structures that may persist in the vagina; (3) changes in the vagina incident to vaginitis; (4) changes due to injuries resulting from childbirth; (5) alterations in the vagina caused by perineal operations; (6) the relation of the urethra to the vagina.

1. THE NORMAL VAGINA. The lining of the cavity is composed of several layers of squamous epithelium, of which the more superficial near the outlet tend to become horny. The deepest layer which rests on the underlying stroma, consists of cells cuboidal or low cylindric in type. The stroma is made up of fibrous tissue poor in cell elements, but as a rule with a well-developed blood supply. Small tufts of the stroma project up into the epithelium producing the so-called papillæ. The vaginal mucosa resembles very closely the normal skin. The pigment in the deep layers is, however, usually wanting.



*Vaginal Glands.* The existence of vaginal glands has been much questioned, but v. Preuschen in 1877 after a careful examination of 36 bodies found definite vaginal glands in 4. The necks of these glands are lined by squamous epithelium, while the deeper portions, which spread out into definite bays, are lined by cylindric epithelium on which cilia may be detected. Opening into the dilated glands are little crypts. Similar glands had previously been noted in 1870 by Hennig. In Path. No. 955, where we were dealing with a small cyst 6 mm. in diameter and lined by one layer of cuboidal epithelium I found a small oval gland space lined by one layer of high cylindric epithelium (Fig. 1). It closely resembled a cervical gland and was surrounded by a definite inflammatory zone.

We were unable to tell whether the cyst was situated in the anterior or posterior vaginal wall.

In Path. No. 5593 there was a complete tear of the perineum and situated in scar tissue were two minute vaginal cysts lined by squamous epithelium. In the vicinity could be seen an almost circular nest of cells with oval vesicular nuclei. In this mass of cells were two definite gland spaces around which the cells appeared to be cuboidal or low cylindric in type. We were at a loss to explain the presence of this group of cells, particularly as they were situated in the posterior vaginal wall, where a complete tear existed. They were too far away from the rectum and surrounded by too broad a zone of fibrous tissue to have originated in any way from the bowel. Furthermore, their appearance did not suggest any relationship to rectal epithelium.

From the foregoing there seems to be no doubt that vaginal glands exist in a moderate percentage of patients.

## 2. EMBRYONIC STRUCTURES THAT MAY PERSIST IN THE VAGINA.

- (a) Gärtner's duct.
- (b) Remains of Müller's duct.
- (c) Misplaced ureter.

(a) *Persistence of Gärtner's Duct.* In the embryo remains of the Wolffian body are recognized as the parovarian tubules situated between the tube and ovary. The duct is continued downward through the broad ligament along the side of or in the substance of the uterus as Gärtner's duct. It lies in the substance of the cervix near its outer side and then extends down the anterior or lateral wall of the vagina nearly to the outlet (Fig. 2).

Although it is sometimes possible to trace the duct nearly its entire length in the human being, as a rule only the upper portion is visible and this in time usually disappears. The structure is best studied in the cow, as in this animal the duct is easily traced. Bland Sutton gives a very good illustration of Gärtner's duct extending down the side of the cervix and in the lateral wall of the vagina, forming two distinct cystic dilatations.

Remnants of Gärtner's duct are sometimes recognized as one or more disconnected segments following the usual course of the duct along the lateral wall or roof of the vagina to the cervix. In some instances it has been possible to trace the duct from the vagina up to the parovarium. In other words, in these cases it was patent for its entire length.

A cross-section of the duct will show an outer covering of fibrous tissue, a middle zone of non-stripped muscle arranged longitudinally, transversely or running in both directions and an inner lining of one layer of cuboidal or cylindrical epithelium.

(b) *Remains of Müller's Ducts in the Vagina.* In some instances Müller's ducts fail to meet. We then may have two uteri and two vaginae. In other cases the ducts are separate in their upper portions and partially unite at the cervix.

Thus we may have a bicornate uterus with two cervixes and two vaginae or a bicornate uterus with one cervix and one vagina. Other minor variations resulting from failure of Müller's ducts to unite occur, but we are here chiefly interested in a variety where one uterus is fairly well developed,

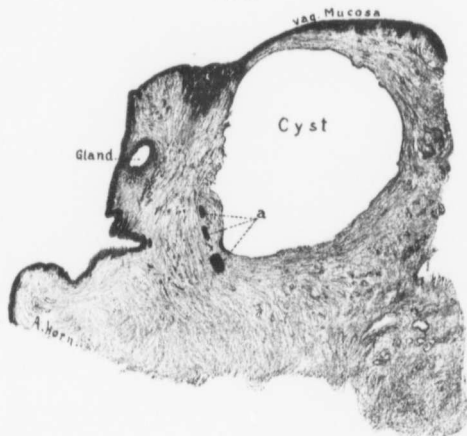
while a second is represented by a rudimentary cord or a very imperfectly formed organ. The corresponding vagina becomes fused with the lateral wall of the well-developed one. Secretions accumulate in this rudimentary vagina until it resembles a cystic tumor springing from the lateral wall of the vagina (Fig. 4). Sometimes its accompanying uterus has been fairly well developed and may communicate with it. In these cases the retained menstrual flow distends the blind vaginal pouch, and when the sac is opened it is found filled with a chocolate-colored fluid. Sometimes the tension becomes so great that eventually a small opening forms and the fluid escapes through the vagina. Such sacs may also become infected before they open. Attention to these rudimentary vaginæ situated in the wall of a well-developed vagina was directed by W. A. Freund in 1877. In his paper he reported several such cases. Kleinwächter shortly after Freund's article reported similar instances.

(c) *Abnormal Relation of the Ureter to the Vagina.* When the ureter is in its normal situation its relation to the vagina is not an intimate one, but occasionally a case is met with in which in one lateral wall a small cystic prominence is detected, from which when opened an escape of urine takes place. In other rare instances a fistulous opening into the lateral vaginal wall has been found through which there was a constant discharge of urine. Where any history of injury to the vagina is excluded, which could possibly have caused a fistulous opening between the normal ureter and the vagina, we are probably dealing with an embryonic abnormality. The latter alternative is more probable where there is a double ureter on the one side. Broedel and others have pointed out that where two ureters and two kidneys exist on one side the ureter from the lower kidney is usually inserted at the normal site, while the one connected with the upper kidney is carried down farther with the Wolffian duct and is inserted more medialward and nearer the inner urethral orifice. It would only be necessary for this second ureter

rudimentary cord or a corresponding vagina is well-developed one. Rudimentary vagina until it is in the lateral wall of accompanying uterus usually communicate with vaginal flow distends the vagina. When it is opened it is found that sometimes the tension of the vaginal wall opening forms and closes. Such sacs may also be referred to these rudiments of a well-developed vagina. (Schachter 1877. In his paper on the vagina shortly after 1877.)

*On the Vagina.* When in relation to the vagina a case is met with a cystic prominence is seen. The escape of urine takes place through an opening into the vagina through which there was no history of injury possibly have caused the cyst. The ureter and the vagina, are in a syzygic abnormality. In some cases where there is a syzygic abnormality and others have two kidneys exist on one side. The ureter is usually inserted into the vagina. It is inserted with the upper ureter. The Wolffian duct and the inner urethral orifice. This second ureter

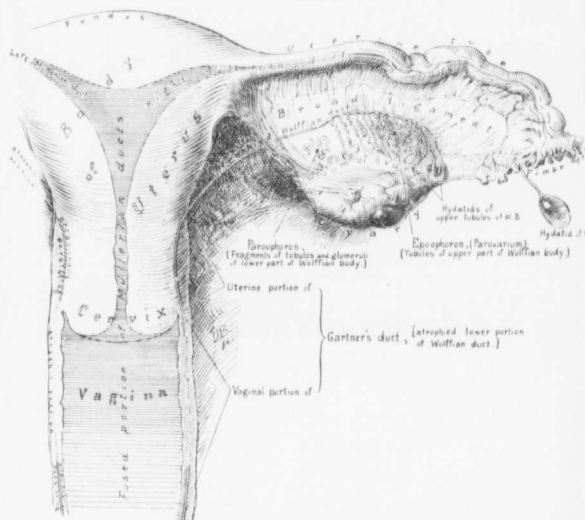
FIG. 1.



A vaginal gland. (Magnified 10 diameters.)

Gyn. Path. No. 955. Lying beneath the slightly atrophic mucosa is a vaginal cyst, 6 mm. in diameter. Immediately beneath the vaginal epithelium is a small gland. This was lined by high cylindric epithelium resembling that of a cervical gland. The dark areas (a) represent small masses of normal vaginal epithelium.

FIG. 2



A schematic illustration of the formation of the uterus, the tubes, and the vagina, and of the relation of the Wolffian and Gartner's ducts to the broad ligament, uterus, and vagina.

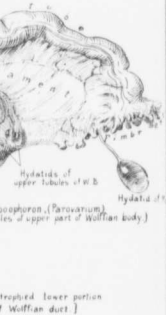
The outer portions of Müller's ducts form the Fallopian tubes. The middle portions unite to form the uterus and the distal portions form the vagina. In the broad ligament between the tube and ovary we see the epoöphoron, or paroövarium, composed of many corkscrew-shaped tubules and communicating along the upper extremities with the collecting duct. They represent the tubules of the upper part of the Wolffian body. Lying embedded at the inner side of the hilum of the ovary are fragments of tubules and glomeruli of the upper part of the Wolffian body. In the drawing Gartner's duct can be traced obliquely down through the broad ligament into the uterus near the internal os. It can be followed through the outer portion of the cervix to the vagina. As a rule, the vaginal, uterine, and inner broad ligament portions disappear.

to be carried down a little farther to have it open into or form a blind pouch in the vagina.

3. CHANGES IN THE VAGINA INCIDENT TO VAGINITIS. Adhesive vaginitis occasionally occurs, especially in young individuals. Here as a result of an ulcerative process or a very severe grade of inflammation associated with loss of the vaginal epithelium the vaginal folds become adherent to one another producing blind pockets. Such a vaginitis may be due to a general systemic infection, to gangrene following the presence of a foreign body in the vagina or to the highly irritative urine where inflammation of the bladder exists. These vaginal occlusions may have a definite bearing on the future development of vaginal cysts.

4. CHANGES IN THE VAGINA DUE TO INJURIES AT CHILD-BIRTH. The different degrees of laceration of the perineum during labor are well known. Sometimes without any external laceration there may be one or more tears in the mucosa within the outlet. Again, there may be a minor or a very extensive laceration of the entire perineum. In many cases not only are the tears deep, but the injury has occurred in such a manner that little tags of mucosa lie partially detached, and during the subsequent healing of the perineum these may be turned in and included between the edges of the wound. Under these circumstances we have squamous epithelium buried in the perineum; that is, lying in the tissue from 1 to 5 mm. beneath the surface. A similar fate of the small tags of mucosa may also follow even when the perineum is immediately repaired.

5. ALTERATIONS IN THE CONTINUITY OF THE VAGINAL MUCOSA CAUSED BY PERINEAL OPERATION. Where it is deemed advisable to repair the outlet some time after labor, after having mapped out a line of denudation it is necessary to remove a large area of vaginal mucosa. But if this is cut away piecemeal instead of in long strips or where the field of operation is not kept perfectly clear, small fragments of the mucosa may be left behind.



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The middle portions in the broad ligament, composed of many tremities with the col-Wolffian body. Lying of tubules and glomeruli's duct can be traced the internal os. It can As a rule, the vaginal,

When the edges of the wound are approximated these islands of mucosa lie more or less deeply embedded in the underlying stroma and entirely cut off from the parent mucosa.

6. THE RELATION OF THE URETHRA TO THE VAGINA. It is very important to have a clear understanding of the relation of the vagina to the urethra as they are intimately associated over a considerable distance. Furthermore, as will be seen later, certain cyst-like dilatations arising from the floor of the urethra should not be confused with vaginal cysts, although at first sight they may bear a striking similarity. Disse in v. Bardeleben's *Anatomy* has given us a very clear description of the urethra which I will quote: "The posterior wall of the urethra is firmly attached to the anterior vaginal wall throughout its entire length. Both canals run parallel to each other. The epithelium of the urethra is about 1 mm. thick. The superficial layers of cells are all composed of squamous epithelium. The cells of the deeper layers are more club-shaped. The mucosa is longitudinally folded, and as a result club-shaped and tubular depressions are produced. Some of these are simple lacunæ, others are glandular in nature and secrete a colloid material which may in time form concretions. The lacunæ are found in the entire length of the urethra. The smaller ones are broad-based and open by a narrow channel into the urethra. The larger ones are tubular, push into the propria, often branch and tend to run parallel with the surface. These are the glands that sometimes produce the hardened secretion. They are termed Littré's glands." On either side of the urethra are Skene's ducts, which must also be remembered in a consideration of vaginal cysts.

VAGINAL CYSTS. It is rather difficult to classify all vaginal cysts accurately according to their origin, and the accompanying figures should be accepted only as representing an approximate ratio of the different varieties to each other. I have examined in all 53 cases, and in a few of these two cysts were present in the same individual.

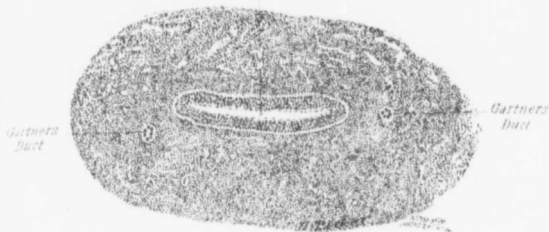
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FIG. 3

uterine cavity



A cross-section of the uterus near the cervix, showing Gartner's duct on each side of the uterine cavity (fetus at end of third month).

The uterine cavity is represented by a long slit lined by several layers of epithelium. Gartner's ducts are situated well toward the outer side of the uterus, are circular and lined by one layer of cuboidal epithelium. The uterine muscle is not as yet well differentiated.

FIG. 4.



Rudimentary vagina in the wall of a well-formed vagina.

A schematic illustration of a blind vaginal pouch due to imperfect union of Muller's ducts. The left uterus is well developed and its corresponding vagina perfectly formed. The right uterus is rudimentary and its cervical portion is represented by a solid cord. The vagina is seen as a blind cystic pouch. Such cavities may collapse, but if distended contain quantities of exfoliated squamous epithelium.



FIG. 5.



FIG. 6.



FIG. 5.—A vaginal cyst occurring three years after repair of a perineal tear.

Gyn. Path. No. 1504. This cyst contained clear fluid and was lined by several layers of squamous epithelium. It was probably an inclusion cyst.

FIG. 6.—Cyst in the anterior vaginal wall.

Gyn. Path. No. 640. Situated beneath the urethra is a translucent cyst. On being dissected out this was found to measure 4.5 x 3.5 cm. Its inner surface was smooth and glistening and it was lined by one layer of flat cells. This cyst was in all probability a dilated portion of a Gartner's duct.

*Variety of Cysts.* In 26 the origin was clearly the result of a perineal tear or of a perineal operation; 4 seemed to originate from vaginal glands; 11 were apparently derivatives of Gärtner's duct; 3 were situated near the external orifice of the urethra. In 9 it was impossible to determine the mode of origin.

*Inclusion Cysts.* (Those due to small portions of the vaginal mucosa being included in the stroma.) Such cysts are relatively small and are naturally found in the posterior or in the lower lateral wall of the vagina. They are often situated in the scar tissue of an old tear or may form a globular mass projecting from the posterior vaginal wall and covered by normal vaginal mucosa (Fig. 5).

In our cases the cysts varied from 3 mm. to 2.5 cm. in diameter. The smaller ones were yellowish in color, the larger more whitish in appearance.

The cyst walls vary from 2 to 4 mm. in thickness; the inner surface is smooth. The cyst contents vary slightly. The smaller ones are often completely filled with a friable material which gives a yellowish tinge to the cyst. This at first sight slightly resembles pus, but in reality represents masses of exfoliated squamous epithelium.

On histologic examination the vaginal mucosa over the surface of the cyst is usually normal, but, as might be surmised, over the most prominent part it is often slightly atrophic. The cyst walls are composed of fibrous tissue; the inner surface is lined by a varying number of layers of squamous epithelium. Sometimes there is a uniform covering of from two to thirty layers of cells, but as a rule the epithelial lining is very thick at one part of the cyst and thin at a distant point. The superficial epithelial cells are often devoid of nuclei and are filled with vacuoles. The deepest layer is usually cuboidal.

The cysts contain desquamated squamous epithelium, detritus, and at times fat droplets and cholesterol crystals. Where the cysts are relatively large the cavity is often

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partially filled with clear fluid. These cysts are usually single, but they may be multiple, as in Path. No. 3321. Here we had three small irregular cysts separated by very slender partitions. They were lined by from two to eight layers of squamous epithelium.

As has been so clearly pointed out by Stokes and others, little doubt remains that these cysts originate from inclusions of the vaginal epithelium. Our own observations fully substantiate this view. In 24 out of 26 of these cases we were able to get a satisfactory history and in every instance the patient had a lacerated perineum, and in 5 out of 24 the perineal tear extended into the rectum. In every case where the site of the cyst was noted it was found either in the posterior or lateral wall, usually in the floor of the perineum.

In Path. No. 2981 I noticed a most unusual picture in the cyst wall just beneath the lining epithelium. Here the fibrous tissue was very dense and contained numerous giant cells, some with nuclei in the center of the cell, others with the nuclei arranged peripherally, while the centers of a few contained large, faintly granular masses. The picture in no way suggested tuberculosis.

*Cysts Probably Originating from Vaginal Glands.* Cysts of this origin are apparently less common. Three of our cases seem to fall under this category, and possibly a fourth. In Path. No. 2131 A there was a cyst 6 mm. in diameter, situated in the scar tissue of an old perineal tear. It was lined by cuboidal or almost flat epithelium. Associated with it was a small cyst of exactly the same size and lined by several layers of squamous epithelium. The first cyst from its situation and epithelial lining was in all probability a cystic vaginal gland. In Path. No. 2133 B there was also a small cyst in the posterior vaginal sulcus lying near the scar in an old perineal tear and lined by cuboidal cells. The cyst cavity was partly filled with mucus. In this case also there was a small accompanying inclusion cyst.

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ying inclusion cyst.

Path. No. 2890 affords another example of a cystic vaginal gland. Here in the scar tissue of the vagina was a cyst 1.5 cm. in diameter lined by very low cuboidal epithelium, which secreted mucus.

In Path. No. 2930 there had been a complete tear of the perineum. There were two very small vaginal cysts lying side by side and lined by cuboidal epithelium. These were probably cystic vaginal glands, but this is only a surmise, as the exact position of the cysts was not given. In Path. Nos. 2131 A, 2133 B and 2890 I think we have a right to assume that the cysts were derived from the vaginal glands, since with the exception of the latter no other cylindrical or cuboidal epithelial structures are found in this region. Of course, it might be said that the cyst was primarily lined by a squamous epithelium and that this had exfoliated leaving only the deepest layer of cuboidal cells; but had this been the case, we would still find evidence of exfoliated squamous cells in the cyst and further we would not have the deepest layer of the squamous epithelium secreting mucus. The most convincing evidence, however, is furnished by the fact that we have clear-cut types of two varieties of cysts, the inclusion cyst and that derived from vaginal glands lying side by side without any degenerative changes taking place in either of them.

ANALYSIS OF VAGINAL CYSTS OBSERVED AT THE JOHNS

[If the reader wishes further particulars about the drawings in the text they will in most instances referring to this table (Gyn. Path. No. 855 is readily found in the first column; the chief clinics)]

Gyn. path. No.	Clinical No.	Age	White or black	Para.	Peri-neal tear.	Previous perineal operation	No. of cysts.	Site of cysts.	Size.	Shape.	Thick-ness of cyst wall.
509	3170	30	White.	2	Com- plete.	.....	...	.....	1.5 cm.	Irregular, globular.	.....
640	3398	29	Black.	...	...	.....	1	Just beneath urethra and 2.5 cm. with- in vagina.	4.5x3.5 cm.	.....	1-2 mm.
648	3402	36	White.	7	Yes.	0	1	Ant. vaginal wall.	1.5 cm.	Globular.	1.5 mm.
955	236 San.	...	"	...	"	0	1	.....	6 mm.	Globular.	0.5 mm.
1411	4834	36	"	6	"	Repaired in 1890.	...	.....	2.5 cm.	.....	2 mm.
1470	4928	41	"	6	"	.....	1	.....	8 mm.	.....	.....
1502	4971	...	"	...	"	.....	2	Just within right vaginal wall in sul- cus	1x1.5 cm. 0.5 cm.	.....	.....
1504	4973	...	"	6	"	Repaired 3 yrs. ago.	1	Posterior wall near outlet.	2.2 cm.	.....	.....
1518	4996	...	"	Yes.	Com- plete.	.....	1	Posterior just to right of median line.	2x1.5 cm.	Globular.	1 to 3 mm.
1562	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....
1775	Speci- men.	...	White.	...	Yes.	.....	1	Anterior vaginal wall.	8x5 cm.	.....	3 mm.
1789	San.	...	.....	.....	.....	.....	1	Left vaginal wall.	1x2 cm.	.....	.....

DERIVED AT THE JOHNS

they will in most instances column; the chief clinical

HOPKINS HOSPITAL DURING THE PERIOD 1893 TO JANUARY 1, 1904.

be found in this tabulated list of the cases. For example, Fig. 1 is from Gyn. Path. No. 955; on features of the case together with the gross and histologic appearances of the cyst are also given.]

Size.	Shape.	Thick-ness of cyst wall.
5 cm.	Irregular, globular.	.....
5x3.5 cm.	.....	1-2 mm.
5 cm.	Globular.	1.5 mm.
6 mm.	Globular.	0.5 mm.
2.5 cm.	.....	2 mm.
8 mm.	.....	.....
1.5 cm.	.....	.....
0.5 cm.	.....	.....
2.2 cm.	.....	.....
1.5 cm.	Globular.	1 to 3 mm.
5 cm.	.....	3 mm.
2 cm.	.....	.....

Cyst contents.	Inner surface of cyst.	Condition of overlying vaginal mucosa.	Composition of cyst wall.	Epithelial lining of cyst.	Cyst contents (microscopic).	Remarks.
Creamy yellow.	.....	Slight thickening with faint down-growths. Atrophied.	Connective tissue.	Squamous epithelium, 5 to 30 layers.	.....	Negative on slide and culture.
Transparent.	Smooth and glistening.	.....	Connective tissue; rich blood supply; small round-cell infiltration beneath surface.	One layer of flat epithelium.	.....	Stokes' drawing.
Transparent.	Smooth and glistening.	Normal.	Fibrous tissue and non-striated muscle fibres.	One layer of cylindrical epithelium.	.....	Stokes' drawing.
Transparent.	Smooth.	Normal, thickening at one point.	Fibrous tissue; contains gland resembling cervical gland in lining and secretion; is surrounded by inflammatory zone.	One layer of cuboid epithelium.	.....	Stokes' drawing.
.....	.....	Normal on sides, total absence over prominent part; no evidence of inflammation where epithelium is missing.	Fibrous tissue; considerable muscle; small round-cell infiltrat'n beneath cyst epithelium.	Several layers of squamous epithelium.	Swollen fatty epithelial cells, many polymorphonuclear leukocytes and small round cells.	Stokes' drawing.
.....	.....	.....	.....	.....	.....	Details missing. Stokes' drawing.
Clear fluid.	Very small, finger-like in-growth.	No vaginal mucosa.	Fibrous tissue; small gland in wall, lined by one layer of cylindrical epithelium.	One layer of columnar cells.	Some desquamated epithelial cells; some cells filled with yellow chromatin droplets.	Stokes' drawing.
Transparent fluid.	.....	.....	Fibrous tissue; some small round-cell infiltration of wall.	Squamous epithelium; in places 10 to 12 layers, where stroma is absent cells are swollen and filled with brown pigment.	.....	Stokes' drawing.
.....	.....	Atrophy over prominent part, normal on sides.	Fibrous tissue.	Squamous epithelium; 1 to 7 layers in places, low cuboid.	.....	Stokes' drawing.
.....	.....	Normal.	Fibrous tissue.	One layer cuboid cells.	.....	Stokes' drawing.
.....	.....	.....	Fibrous tissue; convoluted cysts in wall lined by high cylindrical epithelium; evidently due to downward projections of crypts.	One layer high cylindrical; nucleus at base as in cells from cervix; in places cells cuboid; crypts present in walls.	.....	Stokes' drawing.
.....	Smooth and glistening.	Normal.	Fibrous tissue.	10 to 20 or more layers squamous epithelium.	.....	Stokes' drawing.

Gyn. path. No.	Clinical No.	Age	White or black.	Para.	Peri-neal tear.	Previous perineal operation	No. of cysts.	Site of cysts.	Size.	Shape.	Thickness of cyst wall.
1850	5400	20	White.	0 married.	No.	No.	1	Right side high up.	1 cm.	.....	5 mm.
2010	Specimen.	...	.....	.....	.....	.....	1	.....	5 mm.	.....	1 mm.
2181	5835	28	White.	1	Yes.	0	2	A. posterior r. side 2 cm. B. within vagina in scar tissue.	6 mm. 6 mm.	.....	0.5-1 mm.
2183	5846	33	"	1	"	0	2	Posterior wall close to scar in sulcus	.....	.....	.....
2187	5850	29	"	1	"	0	1	Left vaginal fornix.	1 cm.	.....	1.2 mm.
2555	6287	35	"	3	"	0	1	Right vaginal fornix to right of cervix.	1x1.5 cm.	Globular.	1 mm.
2727	5504	29	"	5	"	0	...	.....	5 mm.	Round.	.....
2878	Specimen.	...	.....	.....	.....	.....	...	.....	1 cm.	Globular.	0.3 mm.
2890	6656	48	White.	1	Yes.	0	1	Right vaginal sulcus in scar.	1.5 cm.	.....	.....
2990	6703	21	"	1	Complete.	0	2	.....	2 mm. 1 mm.	Globular, side by side.	.....
2981	6714	36	"	4	Yes.	0	...	.....	Embed'd 2 mm. in scar tissue.	Oval.	.....
3046	6787	40	"	6	"	0	...	.....	6 mm.	Globular.	2 mm.

Size.	Shape.	Thick-ness of cyst wall.	Cyst con-tents.	Inner surface of cyst.	Condition of overlying vaginal muco-sa.	Composition of cyst wall.	Epithelial lining of cyst.	Cyst con-tents (microscopic).	Remarks.
cm.	.....	5 mm.	.....	Dome-shaped cleavage 2 x 2 mm.	Thickened but normal.	Thickened just beneath mounds; great small round-cell and polymorphonuclear infiltration with new capillaries over gland-like space lined by cylindrical epithelium just beneath inner surface.	Over mounds lining of from 2 to 20 or more layers squamous epithelium; in places definite finger-like folds with gland-like depressions, one covered by a layer of perfectly cylindrical epithelium; nuclei oval and near base; between epithelial cells, mono- and polymorphonuclear leukocytes.	Some polymorphonuclear leukocytes.	
mm.	.....	1 mm.	.....	.....	Normal.	.....	One layer cuboid or low cylindrical epithelium; small finger-like in-growths covered by cylindrical epithelium.	Desquamated epithelium.	
mm.	.....	0.5-1 mm.	.....	.....	Normal.	Fibrous tissue.	A. 1 layer cuboid or almost flat. B. 3 to 20 layers squamous epithelium.		
mm.	.....	.....	.....	.....	Normal over both.	Fibrous tissue.	A. lined by several layers of squamous epithelium. B. apparently lined by cuboid epithelium.	Desquamated epithelium. Mucus.	
cm.	.....	1.2 mm.	.....	.....	Thinned out over prominent part.	Fibrous tissue.	One layer cuboid epithelium.		
1.5 cm.	Globular.	1 mm.	Clear fluid.	Smooth	Normal.	.....	One layer cylindrical in places cuboid epithelium.		
.....	Round.	.....	.....	.....	.....	Fibrous tissue.	Many layers squamous epithelium.	Partly filled with squamous epithelium.	
cm.	Globular.	0.3 mm.	.....	.....	Normal but atrophic.	Fibrous tissue along one side gathered into little folds.	One layer cylindrical epithelium.		
cm.	.....	.....	.....	Smooth	Normal.	.....	One layer very low, cuboid epithelium almost flat.	Mucus taking hematoxylin stain.	
mm.	Globular, side by side.	.....	.....	Smooth	Normal.	Just beneath cyst epithelium non-striated muscle fibres.	Each cyst lined by one layer cuboid epithelium.		
bed'd mm. scar tissue.	Oval.	.....	.....	.....	.....	Just beneath epithelium of cyst dense area containing giant cells, some with nuclei in center, others in periphery; centres of some contain a faintly granular mass.	3 to 8 layers flattened squamous epithelium.	Desquam. and necrotic epithelium and irregular masses of granular material similar to that found in the giant cells.	
mm.	Globular.	2 mm.	.....	.....	Normal.	Fibrous tissue.	1 to 15 layers of squamous epithelium.		



Gyn. Path. No.	Clinical No.	Age	White or black.	Para.	Peri-neal tear.	Previous perineal operation	No. of cysts.	Site of cysts.	Size.	Shape.	Thickness of cyst wall.
2089	6841	33	White.	1	Yes.	0	...	In right lateral wall.	1.4x1.1cm	Globular.	1 mm.
3107	6855	34	"	3	...	.....	1	Left lateral wall just within hymen.	3x1.4 cm.	Oval.	.....
3151	6887	38	"	4	Yes.	0	1	Posterior vaginal wall.	3x2 cm.	.....	.....
3321	7038	21	"	1	"	0	1	Left wall.	Cystic mass of 3 cysts 9 mm.	.....	0.2 mm.
3690	7433	32	"	2	"	0	...	Embedded in scar tissue.	1.5 mm.	.....	.....
3800	7547	34	"	1	"	0	1	Post. wall near outlet embedded in fibrous tissue.	5 mm.	.....	.....
4060	7894	35	"	4	"	0	1	Left lateral wall in scar.	3 mm.	Slightly irregular in outline	.....
4079	7835	26	"	3	"	0	2	.....	A, 4 mm. B, 3 mm.	.....	.....
4112	7854	37	"	10	...	.....	...	.....	2 mm.	Round.	.....
4644	8457	19	"	0	...	.....	1	Anterior vaginal wall just within hymen.	3x3x4cm.	.....	1 mm.
4684	8411	33	"	2	Yes.	Complete.	0	.....	3 mm.	.....	.....
4836	8641	33	"	2	Yes.	Complete.	0	.....	5x2 mm.	.....	2 mm.
5035	8844	33	"	3	...	.....	1	Ant. vaginal wall under urethra.	2.5x1.5cm	Ovoid.	0.2 mm.

a.	Shape.	Thick-ness of cyst wall.	Cyst con-tents.	Inner surface of cyst.	Condition of overlying vaginal mu-cosa.	Composition of cyst wall.	Epithelial lining of cyst.	Cyst contents (microscopic).	Remarks.
1cm	Globular.	1 mm.	.....	Smooth	Gathered up into folds; deep layer pigmented.	Fibrous tissue.	1 layer cuboid or flat epithelium.		
cm.	Oval.	.....	.....	Smooth	Normal.	Just beneath cyst lining two small gland-like spaces lined by cylindric epithelium.	1 layer cuboid cells, apparently 2 to 3 layers in a few places.	Granular material taking hematoxylin stain.	Pearly white, covered on one side by squam. epithel.
mm.	.....	.....	.....	.....	Normal but atrophied over promi-nent part.	Fibrous tissue.	3 to 20 layers of squamous cells.		
ic (of the) a.	.....	0.2 mm.	.....	Some-what irregu-lar.	Normal.	Slight projections of fibrous tissue into cyst cavities; walls between cysts exceedingly delicate.	2 to 8 layers of squamous epithe-lium.		
mm.	.....	.....	.....	.....	Depression from vagina 4 mm. into depth lined by partly macerated squa-mous epithe-lium only sep-arated from cyst by 6 rows of connective tissue cells.	Fibrous tissue.	1 to 7 layers fairly well-defined squa-mous epithelium.		Definite inclusive cyst.
mm.	.....	.....	.....	.....	.....	.....	1 to 20 layers squa-mous epithelium.		Desquam. epithelium, fine granu-lar material.
mm.	Slightly irregular in outline	.....	.....	.....	.....	Dense fibrous tis-sue.	Apparently one layer of squamous cells.		
mm.	.....	.....	.....	A. yellow B. clear fluid.	Thinned out; groups of small round cells beneath surface epithe-lium.	Fibrous tissue; par-tition between cysts very delicate.	A. 1 to 4 layers of squamous cells. B. 1 layer cuboid cells.	A. desquamated epithelium + debris.	Interesting to find different kinds of cysts side by side.
mm.	Round.	.....	.....	.....	.....	.....	2 to 20 or more layers squam. epith cells stain more deeply than usual; a few polymorphonuclear leukocytes betw'n epithelial cells.		Double vaginal septum removed.
cm.	.....	1 mm.	.....	Clear fluid.	Normal.	Fib. tissue; definite inner zone of non-striped muscle running parallel to cyst, beneath inner epithelium a definite stroma in places; cells are round or oval, have deeply staining nuclei, resemble stroma of uterine mu-cosa.	1 layer of cuboid or low cylindric epithelium cling-ing to inner sur-face.	A few mono-and polymor-ph-nuclear leukocytes.	
mm.	.....	.....	.....	.....	.....	Fibrous tissue.	2 to 7 layers of squamous cells.		
mm.	.....	2 mm.	.....	.....	Normal.	Fibrous tissue.	10 to 20 layers of squamous epithe-lium; superficial layers disintegrated.	Desquamated epithelium, debris, and large droplets, apparently fat.	
cm	Ovoid.	0.2 mm.	.....	Smooth	Atrophic over prominence on sides thrown into long tongue-shaped folds.	Fibrous tissue, here and there infil-trated by clusters of small round cells.	1 layer of cuboid or almost flat cells.		

Gyn. path. No.	Clinical No.	Age	White or black.	Para.	Peri-neal tear.	Previous perineal operation	No. of cysts.	Site of cysts.	Size.	Shape.	Thickness of cyst wall.
5087	8846	50	White.	3	Yes.	0	...	.....	7x8 mm.	.....	.....
5043	8851	38	"	3	"	.....	..	.....	3 mm.	Round.	2 mm.
5058	1194 San.	...	"	Yes.	"	.....	1	Posterior vaginal wall.	5 mm.	Round.	2 mm.
5191	9028	31	"	1	"	.....	1	Posterior vaginal wall.	4 mm.	.....	.....
5450	San.	...	"	Yes.	"	.....	...	Posterior wall.	.....	.....	.....
5009	9514	25	"	1	"	.....	1	In left posterior wall embedded in deep scar.	8 mm.	.....	.....
5593	San.	...	"	Yes.	Complete.	.....	2	.....	1 mm. 1.5 mm.	Round.	.....
5792	9595	26	"	1	Complete.	.....	...	.....	5 mm.	.....	1 mm.
5793	9595	28	"	2	Complete.	.....	...	.....	3 mm.	Round.	.....
5819	9621	32	"	6	Complete.	.....	...	.....	1.5 mm.	Round.	3 mm.
6274	Specimen.	...	.....	.....	.....	.....	.....	.....	1 cm.	.....	1 mm.
6290	San.	...	White.	Yes.	Complete.	.....	...	Lateral wall.	1 cm.	.....	2 mm.
6556	San.	...	"	Yes.	Yes.	.....	...	.....	1 cm.	Round.	2 mm.
2380	6118	35	"	2	"	.....	1	Ant. vaginal wall under urethra.	3.5x2.5x2 cm.	.....	.....
2442	Specimen.	...	.....	.....	.....	.....	...	.....	.....	.....	.....
2872	Specimen.	...	.....	.....	.....	.....	1	.....	1x0.5 cm.	Oval.	.....

Size.	Shape.	Thickness of cyst wall.
1 mm.		
mm.	Round.	2 mm.
mm.	Round.	2 mm.
mm.		
mm.		
mm.		
mm.	Round.	
mm.		1 mm.
mm.	Round.	
mm.	Round.	3 mm.
mm.		1 mm.
mm.		2 mm.
mm.	Round.	2 mm.
5x2		
mm.	Oval.	

Cyst contents.	Inner surface of cyst.	Condition of overlying vaginal mucosa.	Composition of cyst wall.	Epithelial lining of cyst.	Cyst contents (microscopic).	Remarks.
		Normal.	Fibrous tissue.	1 layer of almost flat cells, cuboid type.		
		Normal.	Fibrous tissue with bloodvessels.	2 to 7 layers of squamous epithelium.		
	Smooth	Normal.	Fibrous tissue.	3 to 8 layers of squamous epithelium.		
				4 to 6 layers of squamous epithelium.	Filled with desquamated epithelium.	
		Normal.	Fibrous tissue.	2 to 4 layers ill-defined squamous epithelium.	Granular detritus.	
		Atrophic but normal.	Fibrous tissue.	2 to 10 layers of squamous epithelium.		
		Normal.	Fibrous tissue; small circular clumps of epithelium; near center two definite glands lined by cylindrical epithelium.	Many layers squamous epithelium; polymorphonuclear leukocytes between epithelial cells.	Filled with desquamated epithelium and polymorphonuclear leukocytes.	Definite inclusion cyst, also well-defined vaginal glands.
	Clear fluid.		Fibrous tissue.	Apparently cuboid or almost flat epithelium.		
	Yellow and opaque.		Fibrous tissue.	3 to 10 layers of squamous epithelium; superficial layers degenerated—contain large vacuoles.		
	Yellow and opaque.	Normal.	Fibrous tissue.	2 to 8 layers of squamous epithelium; superficial layers almost colorless; vacuolated.		
				Single layer columnar cells.		
		Smooth	Normal.	Fibrous tissue; contains irregular gland-like spaces lined by very high cylindrical epithelium secreting mucus; most of glands open into 1 cavity.		May have developed from urethral glands or Skene's ducts.
		Normal.	Fibrous tissue.	1 to 15 layers degenerated squamous epithelium.	Partially filled with desquamated epith. and crystals.	
	Clear yellow.	Normal.		1 layer columnar or cuboid cells.		
		Normal.		1 layer columnar epithelium; oval nuclei near bottom of cell; protoplasm takes hematoxylin stain.		
		Normal.	Fibrous tissue.	Remarkable picture 3-8 or 9 layers, the superficial layer high cylindrical resting on flattened deeply staining cells; the cylindrical cells bear resemblance to cervical epithelium.		

*Cysts of Gärtner's Duct.* As has already been pointed out, in the fetus Gärtner's duct may in some instances pass from the parovarium down the side of or in the substance of the uterus to the cervix, and thence obliquely downward and inward to the hymen (Fig. 2). In the vagina its course may run just to the side of the urethra or in the lateral wall of the vagina. We also know that while in the majority of cases this duct disappears, in a few instances isolated portions persist in adult life. Such isolated links of the persisting duct may as a result of accumulated secretions become cystic. Numerous such examples are on record. If only one segment of the duct persist, a single cyst develops, but should five or six be present, we may have a corresponding number of cysts, which, as we should naturally suppose, occur in a single row.

The cysts may be exceedingly small, but as a rule reach several centimeters in diameter. In rare instances they almost completely block the vagina. They naturally have an outer covering of vaginal mucosa which over the most prominent part may be atrophic. The cyst walls are usually not more than 1 or 2 mm. in thickness. The inner surface of the cyst may be perfectly circular, but is frequently oblong, and now and then a cyst is met with in which there is a small stem, as it were, leading off from the main cyst. Such a finding would demonstrate fairly conclusively that a portion of the duct has not yielded so readily to the process of dilatation.

The inner surface of the cyst may be perfectly smooth along its convex vaginal surface, and yet present a definite undulating surface on the opposite or fixed side, showing clearly an unequal dilatation and differing thus from an ordinary cyst.

Occasionally we meet with an oblong cyst, as in Path. No. 1775, where the tumor measured 8 x 5 cm. The inner surface presented a definite wavy appearance, being gathered up into large and small folds.

The cysts are invariably translucent and contain a clear

straw-colored or pale fluid. In all of our cases a dilatation of a portion of Gärtner's duct appears to have been responsible for the cyst. In ten of these the position of the cyst was ascertained. In the remaining one the anatomic peculiarities afforded a sufficient clue for the diagnosis. The most common situation was in the anterior vaginal wall just behind the urethral orifice.

As regards our 10 cases the distribution was as follows:

In the anterior vaginal wall near the urethra, 6 cases.

In the right lateral vaginal wall, 1 case.

In the left vaginal wall, 1 case.

In the right vaginal fornix, 1 case.

In the left vaginal fornix, 1 case.

Where the cyst is situated in the vaginal fornix the walls are liable to be considerably thicker as the duct lies more deeply embedded in the tissue.

The cyst walls proper are composed of fibrous tissue; sometimes intermingled with these are bundles of non-striated muscle fiber. They were demonstrated in two of our cases. Where the cyst is small it is often possible to make them out, but in those of large size the muscle is so spread out that sections from various portions of the wall often fail to reveal it although at other points it may be present. The inner surface of the cyst is lined by one layer of cylindric cuboidal or almost flat epithelium.

In the majority of our cases the epithelial lining consisted of cuboidal cells, in 3 cases of cylindric and in 1 of flat cells.

*A Very Unusual Cyst Occurring High Up in the Vaginal Fornix.* Path. No. 1850 must, I think, be included under those probably arising from Gärtner's duct on account of its location—the right vaginal fornix. It, however, presents a most unusual histologic picture.

The cyst was 1 cm. in diameter with walls 5 mm. thick. Projecting from its inner surface were dome-shaped elevations fully 2 mm. in length.

The vaginal mucosa over the cyst is atrophic but normal. The walls are composed of fibrous tissue. The dome-like

elevations are newly formed, consisting of small round cells and many young capillaries. This tissue is permeated by polymorphonuclear leukocytes. Just beneath the inner surface is a well-defined gland-like space lined by cylindrical epithelium.

The lining of the cyst varies much in different places. Over the dome-shaped elevations are from two to twenty layers of squamous epithelium. At other points are definite finger-like folds with gland-like depressions between them. The folds and the clefts between them are lined by one layer of cylindrical or cuboidal epithelium and have oval nuclei situated near the base of the cell. A slight inflammatory change is evident, as polymorphonuclear leukocytes and small round cells are seen between the epithelial cells.

While this case is in all probability rightly classed with those having their origin from Gärtner's duct, the histologic picture is certainly difficult of explanation. This cyst gives no evidence whatever of malignancy. Such gland-like spaces may, however, account for the occasional primary adenocarcinomata that develop in the vagina. In rare instances, as pointed out by Veit and mentioned elsewhere, Gärtner's duct is patent all the way from the parovarium to the vagina. Cystic dilatation of the entire duct occasionally occurs, and as a result we then have a vaginal cyst filled with clear fluid and extending up along the side of the uterus to the parovarium. This might very well be termed a vaginoparovarian cyst. When of moderate size it will occupy one side of the vagina, but when very large, it will occupy not only the lateral wall but also encroach on the anterior and posterior surfaces of the vagina. The cyst contents are usually clear and watery, but if there has been hemorrhage into the cavity they are chocolate-colored. At times these cysts are only partially filled with fluid. Accordingly, if pressure be exerted on the vaginal portion it collapses, the parovarian segment meantime becoming tense. On the other hand, if pressure be made over the parovarium, the tumor mass in this situation disappears and the vaginal portion becomes distended.

In none of our cases did we find evidence of a patent Gärtner's duct.

*Vaginal Cysts Possibly Arising from Urethral Glands.* If vaginal cysts ever owe their origin to urethral glands, such a condition is of very rare occurrence. The possibility, however, cannot be excluded; in fact, in two of our cases various histologic appearances would justify the supposition that the tissue is very similar to, if not identical with, that of the urethra. In Path. No. 2870 we have a cyst 1 x 0.5 cm., oval in form. The overlying vaginal mucosa is normal. The cyst walls are composed of fibrous tissue. The epithelial lining of the cyst presents a most unusual picture. It consists of from three to eight layers. The superficial layer is cylindrical and rests on the underlying layers of flattened and deeply staining cells. The general arrangement of the epithelium simulates that found in the urethra.

In Path. No. 1502 we have a cyst 1 x 1.5 cm., in the anterior vaginal wall just within the hymen and to the right of the urethra. It is filled with clear fluid and has a delicate finger-like ingrowth. The cyst lining is composed of one layer of cylindrical ciliated epithelium.

In the cyst wall is a definite gland space lined by high cylindrical ciliated epithelium. It is just possible that in this case the cyst owes its origin to urethral elements. An origin from Gärtner's duct can, however, equally well be claimed.

Although in both of these cases the features in the main would suggest their origin from urethral structures, the connecting link, namely, the direct continuity with the urethra, is wanting.

*Unclassified Vaginal Cysts.* In nine of our cases, owing to lack of clinical details, it was impossible to venture a classification with any degree of certainty. In Path. Nos. 1470, 4060, 5792, 6274, and 2442 little is known of the clinical history. Path. No. 955 looked very much like a cystic dilatation of a Gärtner's duct. The cavity was lined by one layer of cuboidal epithelium.



In Path. No. 2010 the small cyst had a finger-like ingrowth and was lined by one layer of cylindrical epithelium. It probably also represented a dilated segment of the duct. Path. No. 5037 appeared to have a similar origin.

In Path. No. 4079 B the small cyst was lined by one layer of cuboidal epithelium and lay in close contact with an inclusion cyst. In all probability it was a dilated vaginal gland.

*Gas Cysts in the Vagina.* Various names, such as colpohyperplasia cystica and colpitis emphysematosa, have been applied to this affection, which has been accurately described by v. Winckel. This condition is usually associated with pregnancy and consists of small cystic dilatations occurring usually in the submucosa, but occasionally in the epithelium itself. On puncturing the cyst there is a report with the escape of gas and the cyst collapses. Such cysts only last for a short time and then disappear.

von Winckel in 1886 reported three observations in pregnant women. In a space that could be covered by a dollar he found fifteen to twenty cysts. All were superficial and transparent. The mucosa in which these were embedded was hyperemic and succulent and the cysts were filled with gas. On puncture there was a loud noise with an escape of gas. C. Braum in 1861 recorded similar instances. According to Eisenlohr the cause of this disease must be a gas-producing micro-organism which stretches the lymph vessels and forces the lymph and organisms into the surrounding tissue. According to Strauss, as quoted by Veit, the cysts were usually surrounded by connective tissue, rarely by epithelium. Their occurrence seems to be analogous to that of gas cysts in the liver and other organs, and we should not be surprised if in the near future Welch's *B. aerogenes capsulatus* should be proved to be the causative factor. No treatment is necessary, as the cysts are of short duration.

*Echinococcus Cysts.* In countries in which the echinococcus is prevalent, cysts may develop in the tissue between the rectum and vagina. They may project into the vagina

and resemble vaginal cysts. If a doubt as to their nature exists, a careful microscopic examination of the cyst contents or of its wall will render the diagnosis clear.

*Clinical History of Vaginal Cysts.* All of the cysts in our cases were relatively small, and naturally gave rise to no symptoms whatever. In fact, they were detected during examinations for some other trouble or, as in case of inclusion cysts, during operations for perineal tears. Undoubtedly many of the smaller cysts are overlooked as in the ordinary routine laboratory examination we have found some of which no account had appeared in the clinical report. Cysts 6 to 8 cm. in diameter partially block up the vagina and may interfere with coitus. If situated in the posterior wall they may roll the pelvic floor out in such a manner that at first sight prolapsus of the vagina may be diagnosed.

Cysts of the posterior wall have, in a few instances, formed effectual barriers to delivery. In Peters' case, for example, the cyst contained about one pound of clear fluid, and had to be evacuated with the trocar before labor could proceed normally.

In the case of a vaginoparovarian cyst which is not full mere pressure is sufficient to remove the obstruction, the fluid passing up to the parovarium and the vaginal portion collapsing like a flaccid pouch.

Vaginal cysts in the posterior wall may have to be differentiated from an abscess in the rectovaginal septum. The cysts are not tender. Abscesses are painful, of rapid development and are accompanied by fever. In the lateral wall a vaginal cyst may be mistaken for a blind vagina. The thick walls of the occluded and imperfectly developed vagina and the fact that the uterus is imperfectly developed will usually suffice to render the diagnosis clear.

A suburethral abscess may bear a striking resemblance to a vaginal cyst. In this case, however, pressure on the abscess will be followed by an escape of pus from the urethra and by collapse of the sac.

**TREATMENT.** The smaller cysts are excised and the resultant cavity is sutured. Where it is somewhat large and removal is difficult, half or three-quarters of the cyst, according to circumstances, may be cut off, and the edge of the vagina united with that of the cyst on all sides. The remaining portion of the cyst thus becomes a part of the vagina and gradually unfolds until it is scarcely recognized. Where the cyst is of the vaginoparovarian type drainage or a combined abdominal and vaginal removal may be necessary. It is, however, seldom wise to resort to an abdominal operation, unless there are pressure symptoms or the cyst is very annoying. A small dilated blind ureter must always be borne in mind when removal of cysts in the lateral or anterior wall is contemplated.

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# CYSTS OF BARTHOLIN'S GLANDS,

With Brief Remarks on the Anatomy of the  
Normal Gland Structure.

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PHYSIOLOGY OF THE AMERICAN MEDICAL  
ASSOCIATION, AT THE FIFTY-FIFTH ANNUAL  
SESSION, JUNE, 1904.     :     :     :     :

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THOMAS S. CULLEN, M.D.  
Baltimore, Md.

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1905.

## CYSTS OF BARTHOLIN'S GLANDS,

WITH BRIEF REMARKS ON THE ANATOMY OF THE NORMAL GLAND STRUCTURE.

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THOMAS S. CULLEN, M.D.  
BALTIMORE, MD.

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Bartholin's gland was named after Bartholinus, who described it in detail in the seventeenth century. In 1761 Duverney<sup>1</sup> gave in detail the results of further studies of the gland, and pointed out the resemblance between its tissue and that of the prostate gland; he also mentioned the duct of the gland and demonstrated its opening at the vulva. Huguier<sup>2</sup> (1850) published a most extensive and thorough article on diseases of this gland and referred to it as the vulvovaginal gland.

In 1892 Müller gave a résumé of the literature of the development of Bartholin's glands. He says that they are first recognized in the fetus when it has attained a length of 4.5 cm. Here they are seen as solid cords passing off from the *sinus urogenitalis*.

Pohlman, who has been giving this subject much study in Professor Mall's laboratory, tells me that the beginning of Bartholin's gland becomes apparent just as soon as the first differentiation of sex appears externally. Formerly it was not thought to be demonstrable before the fourth month, but Pohlman has found it in embryos 2 cm. in length. The glands at this time consist of simple pouchings out at the sides of the urogenital sinus. Bartholin's gland in the female corresponds to Cowper's gland in the male. It does not, however, develop so rapidly as the male gland. There is much difference of opinion as to whether Bartholin's gland

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1. Oeuvres anat. Paris, 1761, vol. II, p. 319.

2. Mémoire sur les maladies des appareils sécréteurs des organes génitaux externes de la femme. Mémoires de l'Académie de Médecine, Paris, 1850, vol. xv, p. 531.

is ecto- or endo-dermic. Pohlman thinks that it is probably ecto-dermic.

ANATOMY.

These glands are two in number and are situated in the para-vaginal tissue. They are 2 to 3 mm. in diameter

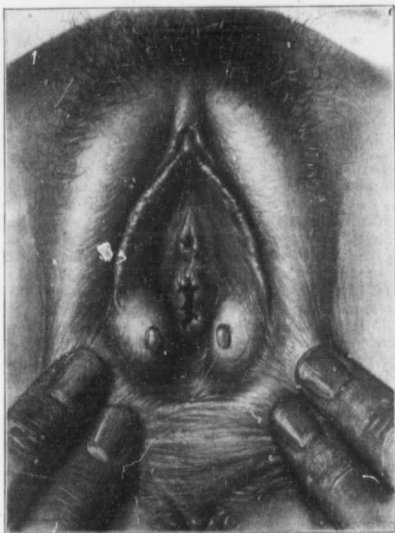


Fig. 7.—Relation of Bartholin's glands to the vagina. (Redrawn after Huguier.) In this case both glands show inflammatory enlargement and from the duct on each side a drop of pus is escaping. The glands are seen in the lateral vaginal wall, a short distance above the fourchette.

and 3 to 5 mm. long. The gland duct passes down on the inner or vaginal aspect and opens into the vagina just below the outer side of the hymen. Huguier, who

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has examined many cases, found them opening in the lateral vaginal wall about 1 cm. above the fourchette. In health the gland may occasionally be recognized as a small pea-sized body which can be rolled between the fingers, when one is introduced into the vagina, while the other palpates the outer vaginal wall. Occasionally the opening of the duct may be detected and a small

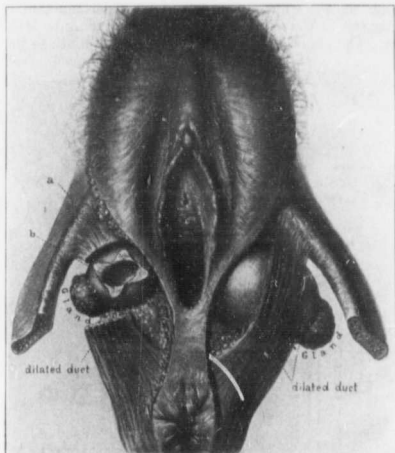


Fig. 2.—Deep relations of Bartholin's glands to the vagina. (Redrawn after Huguer.) In this case the duct to the right of the vagina has become occluded and is cystic, forcing the gland, which is considerably enlarged, further out than usual. On the left of the vagina the duct is also markedly cystic. Under ordinary circumstances the glands lie in the adipose tissue just external to the vagina and are partially covered by the band of muscle shown in the drawing.

probe introduced. If there be a vaginitis, the inflammatory process is prone to pass along the duct and involve the gland. Then, on gentle pressure, a drop of

pus can be squeezed from the duct, as shown in Figure 1. In Figure 2 we have the relation of the gland to the vagina clearly outlined. The gland has, however, been pushed away to the side by the cyst developing in the duct. The glands in this particular case are rather larger than usual.

Under normal conditions the gland secretes a small amount of whitish, slightly tenacious fluid, closely resembling the white of an egg. The gland function is complete at the fifth or sixth month, according to Müller. The gland diminishes in size from the ninth to the

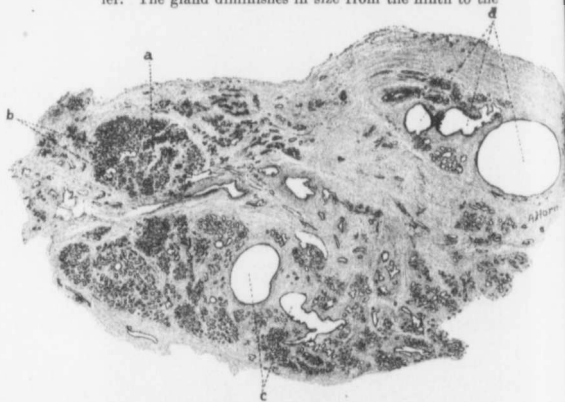


Fig. 3.—A section through the entire Bartholin gland (9 diameters). *a* gives us a clear idea of a lobule composed of many small glands and partially separated by stroma from the neighboring gland elements. At *b* are sections of this lobule's terminal duct. At *c* and *d* are sections of larger ducts.

twelfth year, rapidly increases again between the sixteenth and eighteenth year, and in old age undergoes atrophy.

#### HISTOLOGIC APPEARANCES.

On carefully dissecting out the gland and examining it with very low power it is found that the duct after



leaving the vagina gradually increases in diameter in the vicinity of the gland. It then divides into secondary ducts, and these in turn divide, forming terminal ducts



Fig. 4.—Sections through the main duct of Bartholin's gland. In the center is a somewhat distorted main duct lined by many layers of squamous epithelium. Opening directly into it are several glands. A and B are secondary ducts. The secondary duct at d is lined by squamous epithelium; at b by transitional epithelium. At e a few small glands open into the duct. C is an isolated lobule of Bartholin's gland composed of its many small glands and its terminal duct e. (33 diameters.)

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which drain the secretion from the lobules. The entire gland may be likened to a bunch of grapes, developed more on the one side than on the other. The main duct corresponds to the stem; the secondary and terminal ducts to the branches; and the lobules represent the individual grapes. Figure 3 demonstrates very well the gland as seen on section; *c* and *d* are cross or oblique

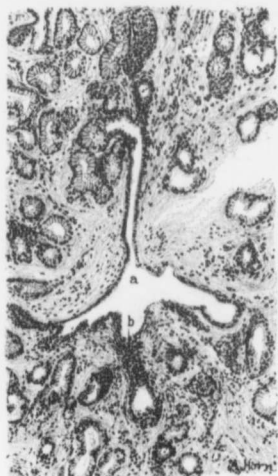


Fig. 5.—Terminal ducts in Bartholin's glands. *a* is a secondary duct dividing into four terminal ducts. These are lined by cuboidal epithelium. At several points the small glands are seen opening into these terminal ducts. The appearance of many layers of cells at *b* is due to the obliquity of the section. The major number of the glands are tubular. The gland epithelium is high cylindrical with the nuclei at the base.

sections of the secondary ducts and *a* is a well-defined lobule.

The duct near the vagina is lined with many layers of squamous epithelium, as seen in the central portion of

Figure 4. As we pass toward the gland, the duct lining is composed of transitional epithelium, still many layers in thickness. In the deeper layers the cells are squamous in type, but in the superficial layer—



Fig. 6.—A section of Bartholin's gland, showing the lining of a secondary and a terminal duct. (90 diameters.) *a* represents a secondary duct which at *b* is lined by transitional epithelium, the surface layer being cylindrical. Opening into the duct at *c* is a small gland. At *d* the duct epithelium is but one layer in thickness. The duct divides into the terminals *e* and *f*, the epithelium of the gland *g* shows well the goblet-shaped cells, indicating that they are filled with secretion.

the one directly in contact with the lumen of the duct—they are of the high cylindrical type. The secondary ducts are likewise lined by transitional epithelium (Fig. 6 at *b*). But the number of layers is usually much less, as seen in Figure 6 between *c* and *d*, and in Figure 4 at *A* and *B*. The terminal ducts may be lined by transitional epithelium, but I have usually found them covered by but a single layer of epithelium. Sometimes the cells are high cylindrical in type, as seen in Figure 6 at *e*. At other times cuboidal, as represented in the four terminal ducts depicted in Figure 5 at *a*. The glands forming the lobules are tubular or slightly racemose, are round or oval on cross section and are lined by one layer of high cylindrical epithelium (Figs. 4, 5 and 6). The cells, if filled with mucus, may be goblet-shaped (Fig. 14). The cell nuclei are small, round or somewhat flattened, stain deeply and are situ-



Fig. 7.—A small cyst of Bartholin's gland. ( $1\frac{1}{2}$  diameters). The inner surface is smooth over a considerable area, but in the upper portion of the drawing are large, sickle-shaped openings of secondary ducts.

ated at the base of the cell. They bear a very striking resemblance to the cylindrical epithelium of the cervix. Their protoplasm does not, however, take the hematoxylin stain, as is so often noted in cervical epithelium. While these small glands which make up the bulk of Bartholin's gland are for the most part confined to the lobules, isolated glands are found here and there opening directly into the main duct or into the secondary ducts, as shown in Figure 4 at *c* and in Figure 6 at *c*.

The elements of Bartholin's gland are held together by a definite connective-tissue framework rich in blood vessels and in non-stripped muscle fibers. This tissue is, according to Müller, amply supplied with nerves.

#### CYSTS OF BARTHOLIN'S GLAND.

From the observations of Müller we learn that the

duct of Bartholin's gland at its exit is about .5 mm. in diameter and that in the neighborhood of the gland it may be fully 2 mm. in caliber. It is readily seen that any irritation producing a vaginitis might cause the two sides of this small duct to become glued together, entirely preventing the escape of the gland contents. This frequently happens, especially if there is a gonorrhoeal infection. If the inflammation be of a virulent character, an abscess of the gland is likely to follow, but if the infection be a mild one there is simply a retention of the secretion and a cyst develops. In some cases the secondary ducts are blocked, while the main duct remains patent. We then usually have multiple cysts in the substance of the gland.



Fig. 8.—Cyst of Bartholin's gland. ( $1\frac{1}{2}$  diameters.) The inner surface is smooth, but opening into the cavity are several sickle-shaped openings—secondary ducts. To the right is the substance of the gland and in it are two small cyst spaces.

#### CYSTS DUE TO OCCLUSION OF THE MAIN DUCT OF BARTHOLIN'S GLAND.

These cysts are superficial (Fig. 2) and vary from 1 to 4 or 5 cm. in diameter; they are tense and rather thin-walled at their most prominent points (Figs. 8, 9 and 11). The body of the gland is pushed outward into the surrounding adipose tissue, as shown in Figure 2.

The cysts may contain a clear and limpid fluid, which is often viscid, but when hemorrhage has taken place from the cyst wall is yellowish or chocolate-colored.

The inner surface of the cyst is smooth, but here and there small round or sickle-shaped openings are seen in the wall. These are the points at which the secondary and terminal ducts open into the main duct. They have naturally become somewhat dilated, owing to the damming back of the secretion which can not escape.

Sometimes the large secondary ducts become completely disconnected from the main duct, and they in turn give rise to secondary cysts, as seen in Figures 10 and 11.

The character of the cyst lining will, of course, depend on the situation of the point of occlusion. If this is near the vagina the cyst wall will be lined by a varying number of layers of squamous epithelium, while that portion of the cyst originating from the duct near the body of the gland will show a lining of transitional epithelium. At numerous points over the inner cyst surface the lining will consist of only a single layer of cells, of the high cylindrical or cuboidal variety. This is due to the unfolding of the small glands that here and there open along the course of the duct.

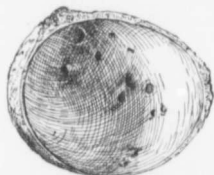


Fig. 9.—Cyst of Bartholin's gland. (Natural size.) The cyst is egg-shaped, has a smooth inner surface and at numerous points shows dilated sickle-shaped or round openings of the secondary ducts. To the left is the substance of the gland.

#### CYSTS DEVELOPING FROM OCCLUSION OF THE SECONDARY DUCTS OR THE TERMINAL DUCTS.

These are naturally much less common. They are multiple and very small. Their contents are similar to those of the larger cysts. Their lining is at certain points composed of transitional epithelium and at other points of one layer of cylindrical cells (Fig. 15).

#### CLINICAL HISTORY OF BARTHOLIN'S CYSTS.

The patient usually gives a more or less definite history of an old inflammation of the vagina which, after an interval of weeks or months, is followed by the development of a swelling low down in one or both vaginal walls. As a rule, this swelling is not very painful, but if bilateral, is frequently associated with discomfort on locomotion. Not infrequently a patient will enter a hos-

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#### TREATMENT.

If the cyst occasions no inconvenience and is not increasing in size it may be left alone. If any operative interference be deemed necessary, it is well to dissect out the entire gland, taking care not to injure the large plexus of veins closely hugging the outer side of the cyst.

#### DETAILED REPORT OF CASES OF CYSTS OF BARTHOLIN'S GLANDS.

The following is a report of the cysts of Bartholin's glands coming under my observation at the Johns Hop-

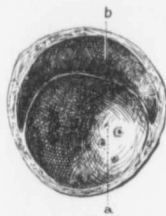


Fig. 10.

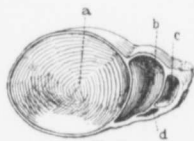


Fig. 11.

Fig. 10.—Double cyst of Bartholin's gland. (Natural size.) *a* appears to be a dilated duct as in its walls are the openings of several secondary ducts. *b* seems to be a cystic secondary duct.

Fig. 11.—Multiple cysts of Bartholin's gland. *a* is probably the cystic main duct. *b*, *c*, and *d*, dilations of secondary ducts.

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kins Hospital during the ten years, 1893 to 1903. It is, however, no index of the number that exists, as the majority of the patients with this condition are treated in the dispensary and do not come to operation. It will be noted that the youngest patient was 17, the eldest 50. Bartholin's cysts are naturally most common during the child-bearing period. It will also be seen from the cases here tabulated that the smallest cyst was 5 mm. in diameter, the largest 4 cm.

CASE 1 (Gyn. Path., 214).—Age 25. Cyst 1.5 cm. in diameter. The cyst wall was composed of fibrous tissue. The cyst was lined by one layer of high cylindrical pale staining epithelium with the nuclei at the base of the cells.

CASE 2. (Gyn. Path., 490).—Age 43. Cyst 2.5 cm. in diam-

ter. The walls were very thin and were composed of fibrous tissue; three definite cyst cavities were found. The glands were somewhat dilated, and the cyst lining was composed of one layer of high cylindrical or cuboidal epithelium.

CASE 3 (Gyn. Path., 2951).—Age 38. Cyst 2.5 cm. in diameter. The cyst wall was of non-striated muscle and fibrous tissue. Typical Bartholin glands were found in the cyst wall, also sections of secondary ducts. The cyst lining was of columnar or cuboidal epithelium. Where it was two layers in thickness the deeper layer was cuboidal, the other cylindrical. This cyst was evidently due to dilatation of the duct, with secondary unfolding of the glands.

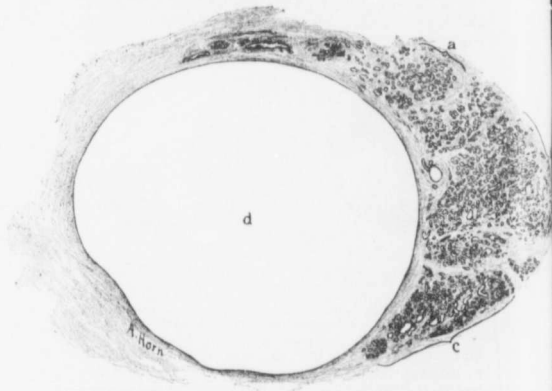


Fig. 12.—Cyst of the duct of Bartholin's gland. (6 diameters.) *d* is the cystic and almost spherical duct. The gland substance has been pushed to one side. The lobular arrangement of the gland is well shown by the three distinct lobules *a*, *b* and *c*.

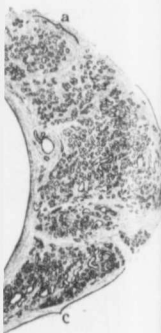
CASE 4 (Gyn. Path., 2971).—Age 44. Cyst 5 mm. in diameter. The walls were composed of fibrous tissue. The cyst lining varied in different places, one layer being of cylindrical epithelium, several layers with the superficial cells cylindrical; several layers of squamous epithelium dipping into the stroma, or one layer of cylindrical epithelium.

CASE 5 (Gyn. Path., 3133).—Age 50. The cyst wall was



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composed of fibrous tissue and had glands scattered throughout it. The cyst lining varied; in places there was one layer of epithelium; at other points two layers, with a superficial layer of cylindrical cells; here and there the epithelium was many layers thick.

CASE 6 (Gyn. Path., 3352).—Age 35. The cyst was 3x3x2 cm., and very thin walled, translucent; on the inner surface there were several smaller semilunar depressions, evidently where other small cysts had opened into the larger one. The cyst wall was of fibrous tissue, with glands in the wall, and the cyst lining consisted of one or two layers of epithelium, the superficial layer of which was composed of cuboidal cells.

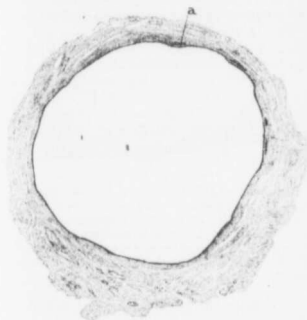


Fig. 13.

Fig. 13.—Small cyst of Bartholin's gland, with gland elements in the wall. (4 diameters.) This cyst originated from the duct and we have a few small gland elements in the wall, as seen at a. For the epithelial lining of the cyst see Figure 14.

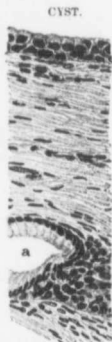


Fig. 14.

Fig. 14.—Lining of cyst developed from Bartholin's duct. (400 diameters.) For the low power see Figure 13. The cyst is lined by two layers of transitional epithelium. a is a typical gland and closely resembles those of the cervix.

CASE 7 (Gyn. Path., 3527).—Cyst 1.5 cm. in diameter; the walls were 1 mm. thick, transparent; there were small round or semilunar openings on the inner surface, indicating remnants of smaller cysts which had opened into the larger one—dilated secondary ducts. The cyst wall was of fibrous tissue,

with some non-striped muscle; the greater part of the gland structure was forced to one side—one gland .5 mm. in diameter, one secondary duct 1 mm. The cyst lining was made up of from 2 to 8 layers of transitional epithelium; superficial layer cuboidal. The cyst had evidently developed in the duct.

CASE 8 (Gyn. Path., 3594).—Size 2.5 cm. The cyst wall was of fibrous tissue; at one end was a large amount of normal gland tissue; some glands were dilated to 3 or 4 times the natural size. A few secondary dilated ducts were seen. The cyst lining consisted of from 2 to 10 layers of epithelium; the superficial layer of which was cylindrical. This was evidently a cyst of the duct.

CASE 9 (Gyn. Path., 3910).—Age 26. Cyst 4 cm. in diameter; the walls thin and translucent, the inner surface smooth, with here and there round or sickle-shaped spaces indicating openings of dilated secondary ducts. The cyst wall was composed of fibrous tissue. The cyst lining consisted of one layer of cuboidal or almost flat cells; at places there were 10 or more



Fig. 15.—Wall of cyst developing from occlusion of a secondary duct and unfolding of the glands. (120 diameters.) At *a* we have transitional epithelium; at *b* and *b'*, transitional epithelium at the mouth of the gland *c*, which is unfolded and now forms part of the cyst wall. The epithelium at *d* also indicates the unfolding of a gland. Here there is considerable flattening of the cells making them cuboidal.

layers of swollen, pale staining polyhedral cells. This patient had tubercular peritonitis.

CASE 10 (Gyn. Path., 4345).—Age 35. Cyst 1 cm. in diameter. The cyst wall was of fibrous tissue and the cyst lining of from 2 to 10 layers of transitional epithelium; the superficial layer being cylindrical and apparently ciliated.

CASE 11 (Gyn. Path., No. 4444).—Cyst 2x1.5 cm., transparent. The cyst wall was of fibrous tissue, containing gland structure, mostly normal, a few glands from three to four times the natural size, with flattened epithelium. The cyst lining was of from two to eight layers of transitional epithelium, the superficial layer being cylindrical. This was a cyst of the duct.

CASE 12 (Gyn. Path., 4535).—Age 35. Cyst 4.5x3x3 cm., egg shaped, thin walled, transparent, and showing on the inner surface several small, shallow, sickle-like openings of the dilated secondary ducts. The cyst wall was of fibrous tissue; the

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gland elements were mostly normal, a few dilated. The cyst lining, in some places, consisted of one layer of high, pale staining cells, side by side, transitional epithelium from 2 to 6 or more layers thick. Unfolding of ducts and glands.

CASE 13 (Gyn. Path., 4643).—Age 23. Size 7 mm. The cyst was situated in the left labium and was very hard.

CASE 14 (Gyn. Path., 5019).—Age 39. Cyst 3 cm. in diameter. The cyst wall was of fibrous tissue, and the cyst lining was composed of one layer of cylindrical epithelium.

CASE 15 (Gyn. Path., 5174).—Age 34. Cyst small. The cyst wall was of fibrous tissue, and the cyst lining was made up of one layer of columnar epithelium, with the nuclei at the base of the cells.

CASE 16 (Gyn. Path., 5250).—Age 17. The cyst wall was of fibrous tissue and the cyst lining was composed of several layers of transitional epithelium; at some points there was one layer only.

CASE 17 (Gyn. Path., 5509).—Age 25. Cysts very small, multiple. The cyst wall was mostly of gland tissue; there were a few cysts varying from a pin point to 2 mm. in diameter. The cysts were mostly dilated secondary ducts, lined in part by transitional epithelium, and in part by one layer of cylindrical epithelium.

DETAILED DESCRIPTION OF CASES REPORTED BEFORE THE  
JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY, APRIL 3,  
1905, BY DR. THOMAS S. COLEMAN.

- III. AN ACCESSORY AND TWISTED OMENTUM.  
PLAN TYPE;
- II. PRIMARY CARCINOMA OF THE RIGHT FALLO-  
PIAN.
- I. FIBROMA OF THE ABDOMINAL WALL.

- I. FIBROMA OF THE ABDOMINAL WALL;
- II. PRIMARY CARCINOMA OF THE RIGHT FALLOPIAN TUBE;
- III. AN ACCESSORY AND TWISTED OMENTUM.<sup>1</sup>

DETAILED DESCRIPTION OF CASES REPORTED BEFORE THE  
JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY, APRIL 3,  
1905, BY DR. THOMAS S. CULLEN.

*I. Fibroma of the abdominal wall springing from the sheath of the external oblique (Fig. 1).* [397]

Mrs. H. M., 30 years old, was referred to me by Dr. Howard Bratton, of Elkton, Md., on Feb. 5, 1905. About three years ago she noticed a very small lump in the left side just beneath the ribs. This increased slightly in size for over two years, but during the last few months has grown rapidly. She thinks she is losing some in weight. On examination a kidney-shaped mass was found just below the free margin of the rib and on a line with the nipple on the left side. It was fairly movable and seemed to be just beneath the skin. On making an incision over it we found that the growth sprang from the sheath of the abdominal muscles, and lay between the muscle and adipose tissue. It was 13 cm. in length and varied from 8 to 10 cm. in breadth. It was lobulated and on its outer margin had a deep hollow that might readily be mistaken for the pelvis of the kidney.

*Pathological Examination* (Gyn.-Path. No. 8290).—The growth varies from 4 to 6 cm. in thickness. In some places it

<sup>1</sup>A brief report of these cases appeared in the BULLETIN for June, 1905, p. 237.

[397] is covered by fat, but on the under surface over a wide area it is intimately blended with the muscle (Fig. 1). It is exceedingly hard and on section bears a striking resemblance to a fibroma. There is a definite and somewhat globular nodule forming about half of the tumor. This portion is somewhat homogeneous, is slightly yellowish in color, and at first suggests the possibility of sarcoma.

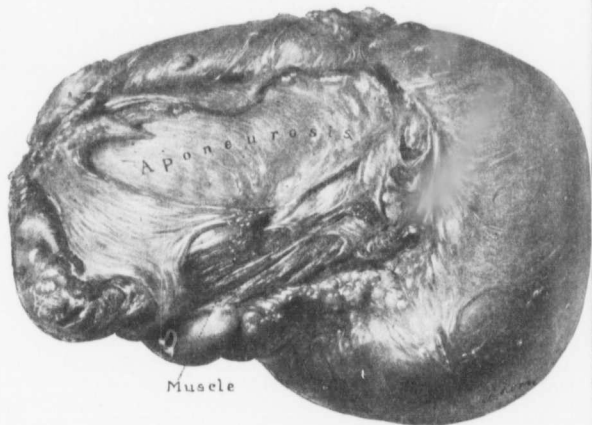


FIG. 1.—FIBROMA SPRINGING FROM THE APONEUROSIS OF THE EXTERNAL OBLIQUE, AND LIES BETWEEN THE MUSCLE AND THE SKIN.

The under or posterior surface of the tumor is shown. The growth bears some resemblance to a kidney in its general contour; on its lower surface is a depression which on palpation might readily be mistaken for the renal hilum. Attached to the tumor is some muscle, also a moderate amount of fat.

On histological examination the growth proved to be a typical fibroma. The nuclei were oval, spindle-shaped or irregular, and stained fairly deeply. The blood supply seemed abundant. We failed to find any areas suggestive of malignancy.

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II. *Primary carcinoma of the right Fallopian tube (Fig. 397) with secondary involvement of the uterus, both ovaries, pelvic peritoneum, omentum, and rectum. Removal of omentum, uterus and appendages, one-third of the pelvic peritoneum, and six inches of the bowel. The patient was comfortable and considered herself well, five months after operation. The respite was, of course, only temporary.*

Mrs. Z. was seen in consultation with Dr. J. Milton Linthicum, Jan. 5, 1905. The patient was 55 years of age. She was sparely built, fairly well nourished, but slightly anæmic. For months she had had some hemorrhage from the uterus and later great pain on defecation; in fact her discomfort had been so great that she said she could not endure it much longer. On examination, under anæsthesia, I found the uterus slightly enlarged and on the right side a firm mass about 6 cm. in diameter. I thought it to be a myoma.

Jan. 7.—On opening the abdomen I found the omentum everywhere studded with nodules, some of them being very small, others 1 cm. or more in diameter, and umbilicated. I questioned the advisability of operating, but Dr. Linthicum thought it wiser to operate, as the patient said "she would rather die than go through the torture that she had been experiencing for several weeks." The omentum was separated close to the transverse colon, as in the vicinity of the colon no metastases were to be found. The right tube was much enlarged and apparently involved in a malignant growth. It was attached to the pelvic floor and the peritoneum at this point, over an area fully 5 by 6 cm., was involved in the process. On the right side the ureter ran directly beneath the thickened peritoneum. On the left side the ovary, although small, was glued down to the pelvic floor directly over the ureter. Posteriorly the uterus was firmly attached to the rectum. It was found necessary to carefully dissect out the ureters first, as it was evident that much of the pelvic peritoneum must be removed. The hysterectomy was carried out practically along the lines laid down by Wertheim's operation.

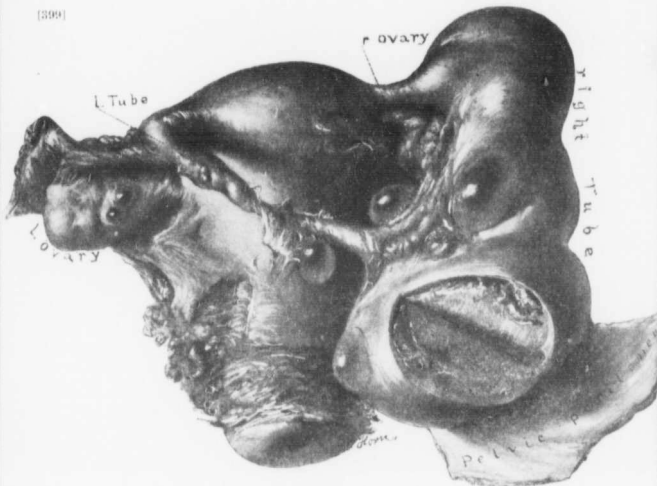


FIG. 2.—PRIMARY CARCINOMA OF THE RIGHT FALLOPIAN TUBE. (Natural Size.)

The right tube at the uterus is normal in size. It soon, however, suddenly becomes much enlarged, is somewhat lobulated, and finally terminates in an occluded fimbriated end 4 cm. in diameter. For the most part it is smooth, but at several points are cyst-like elevations. Here all the muscular coats of the tube have given way, and there is bulging of the tubal peritoneum. The tubal growth is solid and granular as seen where the tube is incised. Attached to the lower surface of the tube is a large flap of pelvic peritoneum.

The left tube is small, passes backward and joins with the occluded and enlarged right tube.

Both ovaries are very small, but on histological examination they were found riddled with cancer. It was impossible to satisfactorily remove the extensive carcinomatous growth of the tube and six inches of the bowel without also doing a complete hysterectomy.





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Fully one-third of the pelvic peritoneum, however, was removed. I had hoped to remove part of the rectum with the uterus in one piece, but found that it was impossible. Consequently it was necessary to separate the uterus from the rectal growth. The rectum was freed on all sides, care being taken, however, not to interfere with the blood supply. The patient was then placed in the perineal position and the skin separated from the rectal mucosa, just as is done in a Whitehead operation. Six inches of the rectum were drawn down through the sphincter and cut off and the upper edge of the rectum was sutured to the skin. The ureters were covered over as far as possible with the remaining peritoneum. A medium-sized gauze drain was introduced into the pelvis and brought out through the vagina. The entire operation took a little more than three hours. The patient had a very feeble pulse when she left the table, which was not surprising, as she was in a weak condition at the commencement of the operation.

*Jan. 8.*—The patient is improving greatly. Her pulse is 126, temperature normal, respirations about 30. This evening there has been considerable vomiting. Sixteen ounces of water were ordered with the hope of washing the stomach out. She vomited four ounces, fortunately retaining the twelve. There have only been about 70 cc. of urine in twenty-four hours, but the general condition does not seem to indicate any uremia.

*Feb. 1.*—The patient has steadily improved since operation. There has been a great deal of discharge from the pelvis, but that is rapidly diminishing. She occasionally has a temperature of 101° F. The sphincter action at first was rather tardy, but is now much better.

*March 1.*—The patient is up and around and suffering little or no discomfort. Of course, a complete recovery is out of the question. The operation was performed merely to relieve her intense suffering.

*Subsequent history.*—During the spring and part of the summer she was free from pain, journeyed to distant points,

[898] and looked very well. About the middle of August she became rather weak; after seven days' rest in bed she suddenly grew worse and died in half an hour. From the symptoms it is possible that death was due to embolism. The operation relieved her of great suffering and gave her over six months of comparative comfort.

Gyn.-Path. No. 8114. The specimen comprises the uterus and enlarged right tube, both ovaries, the small left tube, and a cuff of pelvic peritoneum, the greater part of the omentum, and several inches of the rectum.

The uterus has been removed entirely. It is 7 by 5 by 3.5 cm. and is covered by numerous adhesions. The uterine cavity is of the normal size. The mucosa is thinner than usual and shows nothing of interest.

The right tube at the uterus is 3 mm. in diameter. After passing outward 1.5 cm. it suddenly increases in size, reaching a diameter of 1.8 cm. It gradually increases until near the fimbriated extremity it is 4 cm. in diameter. The entire length of the tube is approximately 12 cm. It is for the most part smooth, but at two points on its inner aspect the muscular coats have given way and we have hernial spaces .8 by 1.8 cm. in diameter covered only by peritoneum (Fig. 2). The under surface of the extremity of the tube is roughened where it has been attached to the peritoneum of the pelvic floor. The tube was not opened until hardened. Sections near the uterus show that the lumen is fully 1 cm. in diameter [899] and that it is filled with a friable, porous, granular looking growth which is free on the under side, but intimately blends with the upper or convex side of the tube. Sections near the outer end of the tube show that the walls are not over 1 mm. in thickness. Here also the tube lumen is filled with a similar friable growth which is whitish yellow or mottled, evidently as a result of old hemorrhages. The tube itself is nearly as large as the uterus.

The left tube is about 5 cm. in length, is slightly beaded, and varies from 3 to 5 mm. in diameter. The fimbriated end is patent and the tube has grown fast to the lower and outer end of the right tube. The right ovary is very small, is approx-

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imately 1.5 by 1 by 1 cm. The left ovary is also atrophic, being [399]  
2 by 1.5 by .6 cm. Attached to the right side of the cervix  
is an irregular area of peritoneum which was approximately  
7 by 6 cm. The central portion of this is hard and indur-  
ated, the outlying portions are smooth.

The rectum is atrophied to a considerable extent. The length  
of the portion removed, in its fresh state, was about six inches.  
The rectal mucosa is smooth and apparently normal. The  
constriction was due to infiltration of the adipose tissue sur-  
rounding the rectum. The nodules in the omentum, as noted  
in the clinical description, are firm. Some of them reach fully  
3 cm. in length.

*Histological examination.*—Sections from the uterus show  
that the surface epithelium is intact. The glands are normal.  
At numerous points the muscle is becoming active and grow-  
ing up into the stroma. It shows us fairly well how an adeno-  
myoma may develop from an in-growth of the muscle fibers.

Sections from the tube near the uterus show that springing  
from the upper wall of the tube is a new growth, as indicated  
in the gross description. The lower part of the tube is free.  
Projecting from the side of the tube where the lumen is free  
are little finger-like outgrowths lined by a single layer of deli-  
cate epithelium. The nuclei are oval and vesicular. Some of the  
nuclei stain very deeply and are rather increased in size.  
They immediately remind one of a malignant growth. Spring- [400]  
ing from the wall of the tube and filling almost the entire  
cavity is a papillary growth. The stroma of the out-growth  
consists of spindle-shaped connective tissue. The epithelial  
covering is one or many layers in thickness. In numerous  
places the epithelial covering has greatly proliferated, so we  
have solid masses of cells many layers thick. Here also there  
are large and deeply staining nuclei. In the deeper portion  
of the growth the connective tissue predominates and we have  
solid nests of cells. The epithelium tends to retract from  
the connective tissue. At numerous points large areas of  
the growth have undergone coagulation necrosis and we have  
fragmentation of the nuclei. The outer muscular wall in  
most places is still preserved. At some points, however, the

1400] entire thickness of the tube has been involved by the growth. Sections from the outer portion of the tube yield practically the same picture. The papillary arrangement is particularly well marked and many of the nuclei are spindle-shaped or irregular, very large and deeply staining. In some sections fully three-fourths of the field have undergone coagulation necrosis. In such areas only a few of the cells around the larger blood vessels still retain their vitality. Scattered 1401] throughout the muscular walls of the tube are definite masses of growth chiefly in the form of cell nests or penetrating glands and on the outer surface of the tube are little bunches of new growths. We have undoubtedly a primary carcinoma of the Fallopian tube with a penetration of the entire tubal wall at numerous points.

Sections from the right ovary, which was very small, show that the organ in some places is normal, but at many points it has been penetrated by masses of carcinoma which send out branches in all directions. The cells present exactly the same characteristics and are manifest in the depth as well as on the surface. Here also there is some breaking down. The left tube near the uterus is practically normal. The left ovary, although also very small, shows diffuse infiltration by the growth. The structure is recognized as typical, carcinomatous glands or as isolated, large, irregular cells with irregular and deeply staining nuclei; in fact the ovary is riddled by the growth.

Sections from the omentum show a most typical picture. In such areas the fat of the omentum is to a great extent replaced by young and old connective tissue, and lying in the connective tissue are masses of epithelial cells, very solid, with a definite glandular-like arrangement. The same large, deeply staining and irregular nuclei are also here in evidence. The nuclear figures are particularly well formed. Rarely do we find a mass of cancer cells in the omentum without a well-defined area of commencing connective tissue development as in this omentum. We find considerable hemorrhage and also breaking down of the carcinomatous elements. The only ex-

tension to the rectum is by continuity from the outer surface. [401]  
The rectal mucosa has not been involved.

*Diagnosis.*—Primary carcinoma of the right Fallopian tube with extension to the peritoneum of the pelvic floor, to both ovaries, and also to the rectum by continuity, general pelvic adhesions; extensive metastases into the omentum.

For a further discussion of the various forms of cancer of the tube, we would refer the reader to Dr. Elizabeth Hurdon's article, published in the *JOHNS HOPKINS HOSPITAL BULLETIN*, Vol. XII, p. 315, 1901, and to the recent article by G. J. Tomson, published in *La Gynécologie* in February, 1905.

*III. Torsion of an accessory omentum (Fig. 3) producing symptom simulating appendicitis. Recovery.*

Mr. E. S. was seen in consultation with Dr. Wm. Wright on March 12, 1905. He is a railroad conductor, 47 years of age, and weighs 180 pounds, has a florid complexion, and is very stout for his height. About six days ago, while upon his train, he found it necessary to put off a drunken man, who suddenly turned and whirled the conductor around twice. Next day he felt a little discomfort in the region of the stomach; on the following day pain over the appendix. When I saw him all abdominal rigidity had disappeared. There was, however, a temperature of 101.5 degrees and his pulse was 100. On examination of the blood it was found that there was a marked diminution in the eosinophiles and a leucocytosis of 17,600. On examining the patient under anaesthesia I failed to find any thickening over the region of the appendix. Nevertheless, I made a gridiron incision, deeming an exploratory section necessary. The appendix was found somewhat thickened and slightly adherent; it was removed. On further examination I found a large area of induration on the right side extending half way between the anterior superior spine and the ribs. The incision was accordingly continued upward as far as the free margin of the ribs. The omentum was found adherent. In order to wall off the parts thoroughly I severed the omentum near the thickening and walled off with gauze. The adherent portion of the omentum was now loos-

[401] ened and removed without any difficulty and with no hemorrhage. On carefully manipulating the area of induration, which was at about the junction of the ascending and transverse colon, I was able to loosen up a very strange looking mass which had a mottled appearance, was grayish yellow, and had fine reddish markings all through it (Fig. 3). One of the doctors present suggested hemorrhagic pancreatitis. On following this mass down to the pedicle, which was about 1 cm. in breadth, it was found to contain two small blood vessels. The mass was tied off and removed. It was situated just to the outer side of the jejunum and was slightly adherent to the gall bladder and had become twisted upon itself and was becoming gangrenous. When unfolded it was found to consist of tissue in no way differing from omentum. Where it had been folded upon itself the parts looked gangrenous. These areas were bluish black in color. The gall bladder was normal.

The patient made a very satisfactory recovery. When last seen, in October, he was in excellent condition.

Gyn.-Path. No. 8114. The entire specimen is fan-shaped when partially unfolded. It is 14 cm. in length, and at the lower margin reaches 12 cm. in breadth. The edge is sharp. On section the hardened specimen is brownish-black, evidently due to thrombosis of the blood vessels.

On histological examination the growth proves to be omentum. The blood vessels are much distended and the blood is apparently coagulated. There is considerable hemorrhage into the adipose tissue surrounding the vessels.

In this case the symptoms were very suggestive of appendicitis, and without an exploratory operation the true condition of affairs could not have been ascertained. With the abdomen open this hard growth felt very much like a nodular, carcinomatous mass, and even when the incision had been lengthened inspection of the growth strongly suggested malignancy or acute pancreatitis. An accessory omentum is, to say the least, a very rare condition. Had this accessory omentum remained in much longer, total gangrene would undoubtedly have occurred.

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FIG. 3.—TORSION OF AN ACCESSORY OMENTUM.

This accessory omentum was attached near the junction of the ascending and transverse colon and was absolutely independent of the normal omentum. The lower border gives its relative breadth. It has become twisted on itself from right to left several times. At the points of twisting the tissue was bluish black. The pedicle is very small. We have unfolded the lower border in order that the omental structure may be more clearly seen.

On histological examination the tissues presented the typical picture of omentum; the vessels were, however, thrombosed and there was considerable extravasation of blood into the fat.

# LARGE CARCINOMATOUS TUMOR OF THE LIVER.

Removal Seventeen Months After Nephrectomy for Carcinoma of the Left  
Kidney. Temporary Recovery.

THOMAS S. CULLEN, M.B.,  
Baltimore.

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ONE HUNDRED AND FIFTEEN DEARBORN AVENUE  
1905.

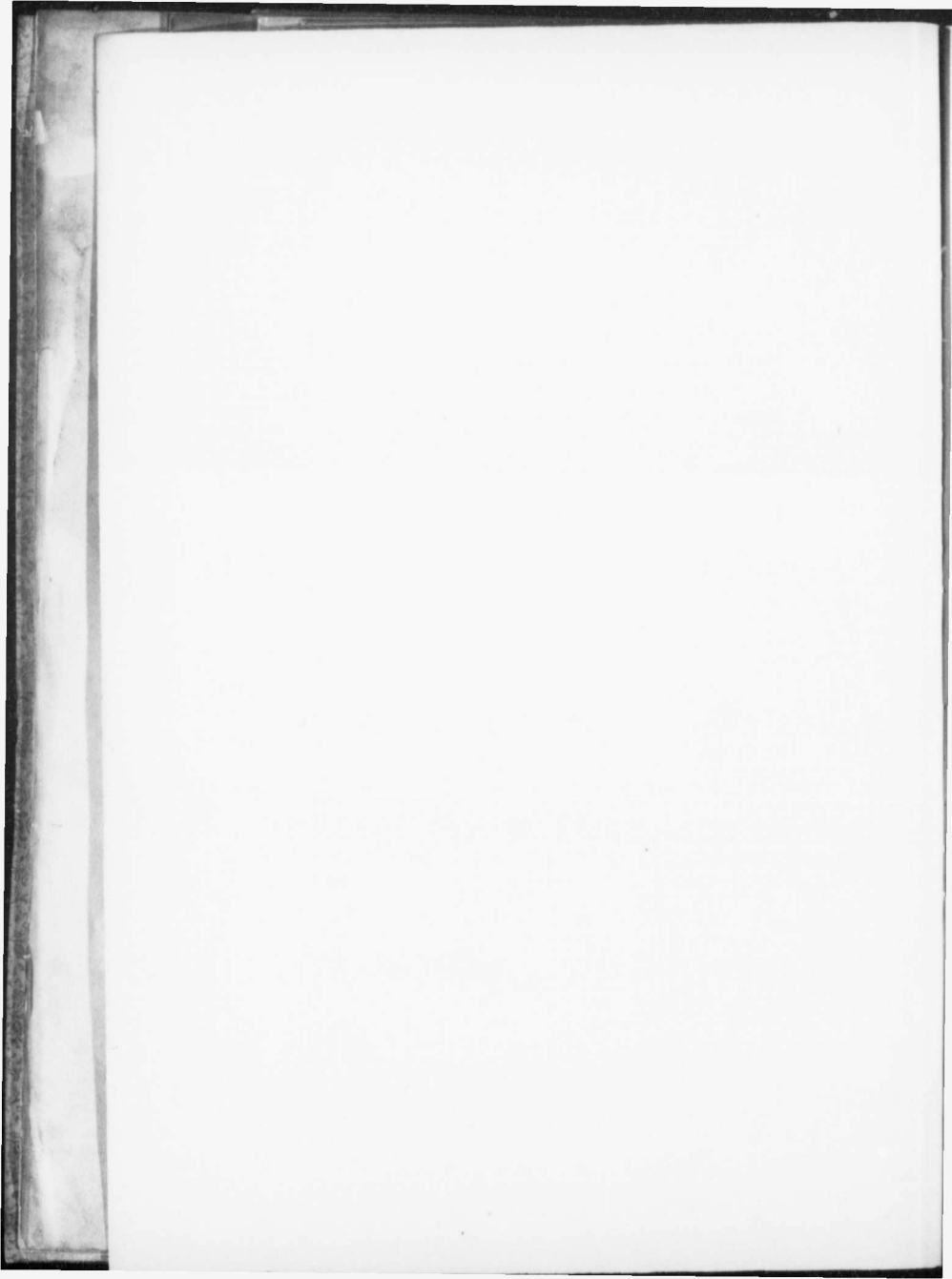


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## LARGE CARCINOMATOUS TUMOR OF THE LIVER.

REMOVAL SEVENTEEN MONTHS AFTER NEPHRECTOMY FOR CARCINOMA OF THE LEFT KIDNEY.

TEMPORARY RECOVERY.

THOMAS S. CULLEN, M.B., BALTIMORE.

Although Brunn in 1870 removed a small hepatic tumor, the surgery of the liver does not seem to have attracted much attention until Lin, in 1886, successfully performed a partial resection. Since that date, however, more than 100 resections of portions of the liver have been reported. Among the exhaustive treatises on the subject those of Terrier and Auway,<sup>1</sup> in France,

delphia is intimately associated with the development of the technic of liver surgery. He has not only reported three cases of resection, in all of which recovered took place, but has also published an exhaustive review of the previous literature. Nor should it be forgotten that a Baltimore surgeon, Dr. Louis McLane Tiffany,<sup>4</sup> was one of the first Americans successfully to remove a tumor of the liver.

*The Nature of Hepatic Tumors.*—Few operators have reported more than one case, and as each has had his own idea of the proper nomenclature of tumors, there is naturally much diversity of description. With the more thorough study of the subject, the varieties will undoubtedly be materially diminished in number. The list of those given is as follows:

Constricted and prolapsed lobe of the liver.  
 Fibroma.  
 Syphiloma or gumma.  
 Tubercle (occasionally single, may reach 3 or 4 cm. in diameter).  
 Adenoma.  
 Lymphadenoma.  
 Cysts: (a) echinococcus cysts; (b) biliary cysts (large and lined by one layer of cylindrical epithelium).

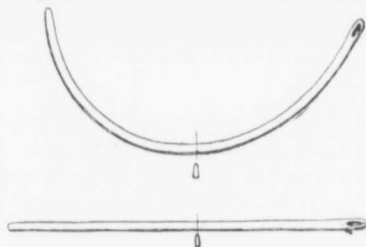


Fig. 1.—Kousnietzoff's blunt needle. This large curved needle has a rounded point. Its shape on cross section is shown in the small sketch below. The straight needle is preferable for mattress sutures.

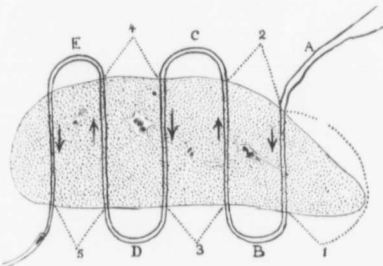


Fig. 2.—Kousnietzoff's liver suture. The needle is threaded double and is carried in and out through the liver, producing a continuous mattress suture, which is cut up into single mattress sutures before tying.

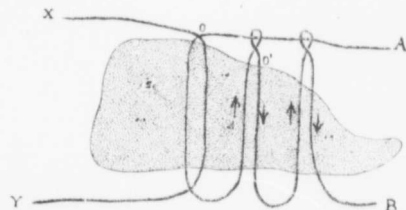


Fig. 3.—Auway's liver suture. This is the so-called chain suture, and after insertion is drawn taut.

Angioma: (a) congenital; (b) acquired.  
 Lymphangioma cavernosum.  
 Cancer: (a) primary; (b) secondary.  
 Sarcoma: (a) primary; (b) secondary.  
 Endothelioma.  
 Aneurism of the hepatic arteries.

Echinococcus cysts, cancers and syphilomata are the most common of hepatic tumors. The growths vary greatly in size, some being not more than 2 or 3 cm. in diameter, while others, as in Pfannenstiel's case, may be so large as to render the abdomen larger in its dimensions than that of a pregnant woman at term.

### INCIDENCE AND SYMPTOMS OF HEPATIC TUMORS.

Tumors of this character may be found in the young or in the old. They are, however, most common between the twentieth and fiftieth years. As has been pointed out by Keen, hepatic growths are much commoner in women than in men. In 68 cases analyzed by him, 13

and of Langenbuch,<sup>2</sup> in Germany, deserve especial mention. In America the name of W. W. Keen<sup>3</sup> of Phila-

1. Terrier and Auway: *Les Tumeurs du Foie*. Rev. de Chir., 1898, vol. xviii, p. 403.

2. Langenbuch: *Chirurgie der Leber und Gallenblase*, Deutsche Chirurgie, Stuttgart, 1897.

3. Keen, W. W.: *Resection of the Liver*, Boston Med. and Surg. Jour., vol. xxvii, p. 405, 1892; *Pennsylvania Med. Jour.*, 1897; report of a case of resection of the liver for removal of a neoplasm, with a table of 76 cases on resection of the liver for hepatic tumors. *Ann. of Surg.*, September, 1899.

4. Tiffany, Louis McLane: *Maryland Med. Jour.*, 1890, vol. xxxiii, p. 531.

of the patients were males and 55 females. He thinks that the relative immunity in men is probably due to the looseness of the clothing worn. In the additional cases which I have collected, 4 of the patients were men and 12 were women.

The symptoms of hepatic tumors are in no way characteristic. Practically, they are those belonging to any growth developing in the right upper abdominal quadrant. When the growth is primary and situated near the lower edge of the liver in a thin patient, it is sometimes palpable, but if the individual be stout the growth can readily be overlooked.

#### DIAGNOSIS.

Hepatic tumors are rarely correctly diagnosed until

sion or palpation, or both, will enable us to detect a definite connection between the tumor and the liver.

Even after the abdomen has been opened and the tumor exposed, one is often still in doubt as to the exact nature of the growth. If the patient has given a definite history of syphilis, it may be assumed, with a relative degree of certainty, that a gumma is present; on the other hand, if a carcinoma of the stomach be present, the surgeon will be justified in concluding that the hepatic growth is a secondary cancerous nodule.

As a matter of fact, it is rarely possible to be able to make more than a tentative diagnosis, until the growth has been removed. In our case the left kidney had been removed nearly eighteen months previously for carcinoma. The symptoms accompanying the hepatic

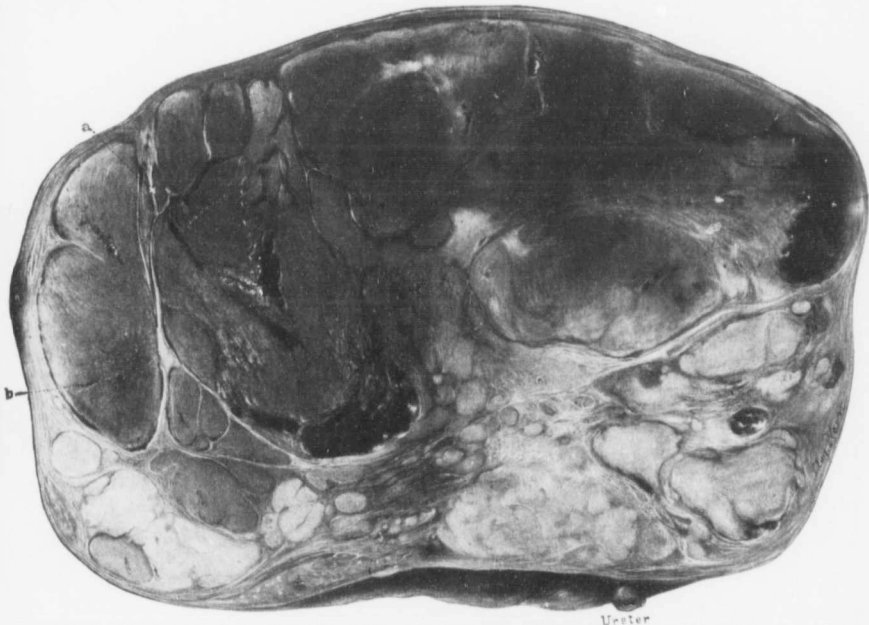


Fig. 4.—Adenocarcinoma of the kidney (natural size). Gynecologic Pathologic No. 4394. This is a longitudinal section of the hardened kidney. There is a well-defined outer capsule which consists almost entirely of connective tissue. Passing off into the growth from the capsule are trabeculae (a) which divide it into large and small abscess. The growth presents a decidedly mottled appearance. At b it is finely granular. In numerous places it has undergone necrosis and disintegration as seen at c. The ureter is little, if at all, enlarged.

the abdomen is opened. In the cases reported the growths have been mistaken for tumors of the kidney, ovarian cysts, uterine myomata, mesenteric and pancreatic tumors, tumors of the colon, aneurisms of the aorta, growths in the gall bladder and stomach, and abscess of the liver. This is equivalent to saying that in a series of cases they have at one time or another been confused with almost every tumor that may be present in the abdomen. Such a tumor is usually first noticed on the right side, in the region of the lower edge of the liver. In the rare instances in which the movement of the diaphragm is transmitted to the tumor, we possess a diagnostic sign of much value. Occasionally, percus-

tumor were quite applicable to a case of liver abscess, and after the abdomen had been opened the general picture suggested an inflammatory process of the liver. Furthermore, on careful examination of the left renal region no evidence of a return of the former growth could be detected. The internal organs were in good condition, and in the liver no other nodules could be found. The absence of any inflammatory reaction at the junction of the tumor with the normal liver substance was the only sign that pointed against the presence of an abscess. In short, it was found to be impossible to determine with any degree of certainty whether the tumor was an abscess or a metastatic carcinomatous

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node. As the remaining kidney was already impaired, it was thought that, even should the swelling prove to be an abscess, an attempt at drainage would be associated with considerable danger of an acute peritonitis, and that even if this complication were avoided, the continual discharge from the abscess wall would militate against the patient's recovery. On the other hand, in case the growth were malignant, it was evident that the only hope of success lay in its complete removal. Even after the tumor had been sent to the laboratory a provisional diagnosis of abscess of the liver was made

Ponfick, Tillmanns and Ceccherelli. Ponfick<sup>5</sup> found that it was possible to remove three-fourths of a dog's liver without permanent injury to the animal, and that in thirty days the organ had regained its normal size. Regeneration was partly due to hypertrophy, but mainly to multiplication of the remaining liver cells. No new lobules were found. Judging from analogy, the surgeon would naturally infer that in man large portions of the liver might be removed and the patient recover; and the reported cases prove that the suggestion is well founded, as in some instances large areas have

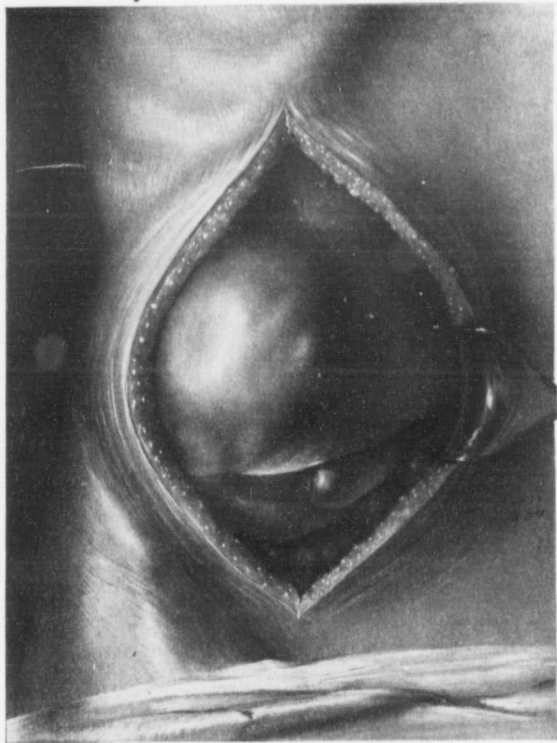


Fig. 5.—Secondary carcinoma of the liver (one-half natural size). The liver is markedly displaced downward. Occupying the greater part of the right upper quadrant of the abdomen is a hepatic growth. Downward this almost reaches the anterior superior spine; medianward it passes nearly to the umbilicus and laterally makes the abdominal wall prominent. The growth seems tense, is slightly lobulated and, although sharply outlined, gradually blends with the liver substance. The edge of the liver forms a prominent ridge along the lower margin of the growth and the gall bladder is seen lying against the under and inner surface of the tumor. It is readily seen that when the cystic duct was severed the greater part of this liver could be rolled out of the abdomen. For a cross section of the hepatic growth see Figure 7.

after a thorough macroscopic examination, and the histologic revelation of adenocarcinoma came as a great surprise.

#### EXPERIMENTAL RESECTION OF PORTIONS OF THE LIVER.

The exhaustive articles of Langenbuch<sup>2</sup> and of Terrier and Auvray<sup>1</sup> give in detail the interesting animal experiments of Glück, Tizzoni, Griffini, Podvisotzky,

been resected and the patients have regained perfect health.

#### INDICATIONS FOR RESECTION OF A PORTION OF THE LIVER.

It is important to determine (1) whether the growth be malignant or not; and (2) if malignant, whether it

5. Ponfick: *Lancet*, 1890, vol. 1, 881.

is primary or secondary. In the case of metastatic neoplasms, as a rule, operation is contraindicated, inasmuch as they are usually multiple. Primary carcinoma or sarcoma of the liver is rare. Should the hepatic growth be primary, the glands along the vessels and at the base of the liver should be carefully palpated to ascertain whether they have become involved. This point was first insisted on by Tuffier.<sup>6</sup> In cases of lymphadenoma, with secondary nodules in the liver, operation is not advisable. In all cases of liver growths the following points should be carefully considered: (a) Whether the growths be single or multiple; (b) situation; (c) size; (d) whether they are pedunculated or not.

If the growths are multiple and scattered over a wide area, removal is difficult or impossible. On the other hand, provided that they are near the lower edge of the organ, resection is feasible. In fact, in the majority of cases the situation is all important.

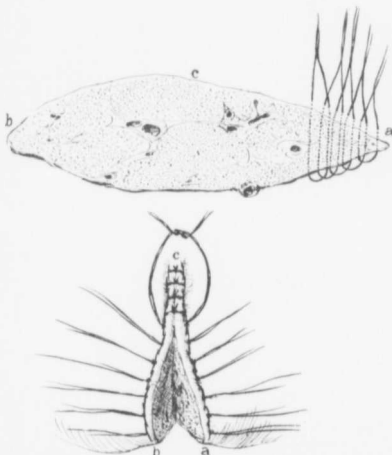


Fig. 6.—Method of controlling hepatic hemorrhage. The cut surface represented in the upper sketch measures 16x5 cm. Mattress sutures were applied about 1 cm. from the line of section. Each overlapped the other so that every particle of liver substance was controlled. Fagenstecher sutures were used, reinforced by catgut, where necessary. The large vessels were readily picked up with forceps and tied freehand. After all the sutures had been tied and lifted up, a and b tended to come together. Beginning at c, corresponding opposite sutures were drawn across and tied to each other. The approximation was good, but not quite so accurate as one would infer from the sketch.

The size is of little importance when the growth is pedunculated and situated near the lower margin of the liver. In the case of a large tumor, however, located near the middle of the organ, removal is exceedingly difficult or impossible. If it is located near the edge, amputation is not difficult, but if it is near the middle of the lobe, a very large portion of the liver must be resected, or a cavity is left which may be the source of an alarming or even uncontrollable hemorrhage. When the growth lies near the portal vein or hepatic arteries, operation is contraindicated, since large branches of these vessels are liable to be injured with a resulting

necrosis of correspondingly large areas of liver substance and the death of the patient. If the growth be pedunculated, its removal is easier, inasmuch as the liver substance forming the pedicle is much tougher than other portions of the organ. This toughening is due to partial atrophy of liver cells.

#### METHOD OF PROCEDURE.

After having decided that the growth is to be removed, free exposure of the liver is absolutely necessary. The abdominal incision is lengthened, and may be curved to the right or left as desired. If the liver is freely movable, the greater part can be brought out of the abdomen; but if the organ is fixed, it will be necessary to loosen it. This is accomplished by severing the suspensory and round ligaments and, if necessary, to a limited extent the ligamentous attachments of the diaphragm. Care must be exercised to avoid injury to the pleural or pericardial cavity, and in case of such an accident the opening should be immediately closed with catgut sutures. The mobility of the liver may also be considerably increased by cutting through the cystic duct, as was done in this case, after which two-thirds of the liver was easily brought outside the abdomen. If the liberation of the liver obtained in this manner is still insufficient, portions of the lower ribs may be cut through and turned back. This free exposure of the liver will be found of the greatest comfort to the operator during the subsequent steps of the operation; for not only is he able to control the blood supply much more thoroughly, but he is also working outside the body instead of deep down in the cavity.

#### TEMPORARY MECHANICAL CONSTRICTION.

Prior to cutting into the liver, a constricting band, if possible, should be thrown around the organ, at least an inch or more from the line of section. Many surgeons have employed strong rubber tubing; or a long piece of gauze twisted in the form of a rope, as used in this case, will answer equally well. Even after this has been drawn tight and clamped with forceps, it must be carefully watched throughout the entire operation, as it is liable to slip from the slanting liver substance and thus fail to prevent a free hemorrhage.

#### THE INCISION INTO THE LIVER SUBSTANCE.

When we remember the great number of blood vessels that are present one can readily understand the dangers connected with the removal of a large segment of liver substance. In Langenbuch's most graphic account of his experiences we are told that during an operation the hemorrhage was so sudden and severe that the abdomen was in an instant full to overflowing with blood and the field of operation was obliterated. Any one who has read his account will certainly never fail to have plenty of assistants, and every conceivable requisite is at hand to meet any similar emergency. Now-a-days, fortunately, the picture is not so disheartening, thanks to the improvements in technic introduced by Keen, Kousnietzoff<sup>7</sup> and Auvray. I shall not attempt to give in detail the various methods employed, but shall only sketch very briefly the procedures that have apparently yielded the best results.

The liver substance may be severed by: (1) The knife; (2) the cautery (at a dull red heat); (3) the blunt scissors or curette; (4) blunt dissection, peeling

6. Tuffier: Bull. et mém. de la Soc. de Chir. de Paris, 1897, n. s., xxiii, p. 70.

7. Kousnietzoff (Kuznetsoff): Laitop, russk. Chir., S. Peterb. 1901, 6, 888-931. Mikulicz wrote the preface to this article and mentioned the number of cases operated on by him.

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the tumor out with the thumb nail (Keen). Each method has its advantages and its drawbacks. The knife gives a clean-cut surface, but many vessels are opened and bleed freely. The cautery leaves a charred surface, and vessels that are temporarily controlled may bleed later. The operator hardly feels safe in trusting solely to small plugs of clotted blood to control the small and medium-sized vessels, when he knows that the escape of one of these may mean fatal hemorrhage. On the other hand, nothing checks capillary hemorrhage better than the cautery at a dull red heat. Blunt scissors, the curette and blunt dissection with the finger leave a much rougher base, but injure far fewer vessels.

THE CONTROL OF HEMORRHAGE.

Probably the safest plan is to control the bleeding

Kousnietzoff, we now possess a needle that renders the application of sutures almost or entirely bloodless (Fig. 1). This needle may be straight or curved; it is flat on the sides, and rounded at both ends. It is gently and slowly forced through the liver substance, and, being blunt, pushes the blood vessels to one or the other side. This needle has yielded admirable results in dogs, and Mikulicz, who has employed it six times in the human liver, says of it, with some enthusiasm: "To my mind Kousnietzoff's needles represent the egg of Columbus in the technic of liver surgery."

*Cautery.*—Keen slowly and cautiously employed the cautery at a dull red heat, and took twenty minutes to cut off the desired segment. He was usually able to see the larger vessels before they were opened. These

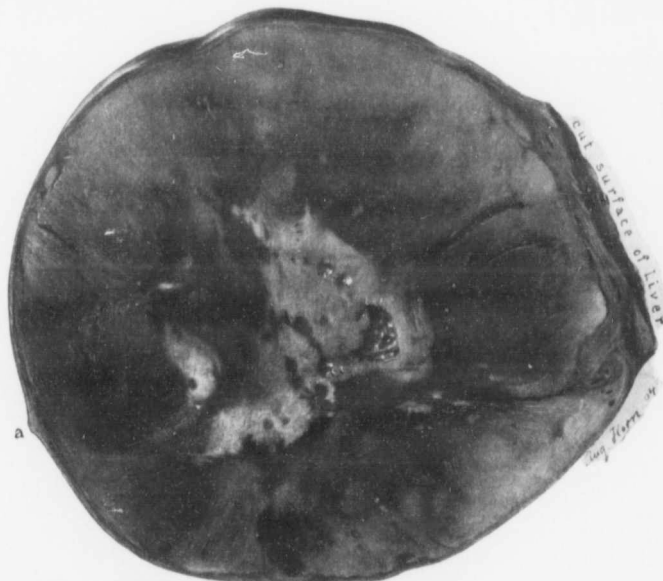


Fig. 7.—Secondary carcinoma of the liver (natural size). As the specimen was very soft it was impossible to cut it before hardening. Encircling the entire growth is a definite capsule varying from 1 to 3 mm. in thickness. a is the sharp edge of liver substance that passed over the lower surface of the growth. This growth bears much resemblance to the parent kidney tumor (Fig. 4), and in its central portion has undergone complete necrosis. The cut surface of the liver indicates the line of amputation.

before making any incision into the liver or to tie off different segments as they are severed. Langenbuch has pointed out that the liver substance often shows pathologic changes when tumors are present. Thus there may be a hyperemia associated with an increased friability of the organ rendering the application of sutures difficult. On the other hand, there may be an atrophy of the liver cells accompanied by an increase of connective tissue, which renders the tying of ligatures a relatively easy procedure.

*Needles.*—One of the chief sources of hemorrhage in liver operations has been from the needle holes; in fact, in some cases, the free oozing from these sources has been uncontrollable. Thanks to the ingenuity of

he tied, both proximally and distally, and then burned through them. If a large vessel was opened before being tied, he plugged the opening with his left index finger, while with the right hand he passed a ligature threaded on a curved needle carefully through the surrounding liver substance; the ligature was then tied slowly by an assistant. In this manner he was able to remove the growth with little difficulty. Keen insists on the use of dull red heat, and points out that, if the tissue is cut through too rapidly, a sufficient eschar is not formed to check the oozing. In some of his work he combined blunt dissection with the finger with the use of the cautery.

*Sutures.*—Kousnietzoff has devised a rather compli-

cated continuous suture (Fig. 2), which practically resolves itself into a series of mattress sutures. Auvray has advised a continuous chain suture which he has found to work well (Fig. 3), its object being to distribute more equally the strain on the liver substance and so render it less liable to tear. The sutures of Kousnietzoff and Auvray would seem, from the illustrations, to be open to the objection that hemorrhage might occur from the spaces between adjoining sutures. In our case simple mattress sutures were introduced with the blunt needle (Fig. 6), each suture overlapping the other so that no area was left unprotected. After the application of three or four sutures about 1 cm. from the line of section, the liver was severed over a corresponding area, an assistant in the meantime holding the placed sutures taut. The tumor was grasped firmly in order to prevent oozing.<sup>8</sup>

The sutures were now slowly and snugly tied; others were then applied in a similar manner, and the entire liver growth was readily removed in about ten minutes. The mattress sutures were tied after the tissues had been cut, instead of before, because the liver was stretched near the tumor, and there was danger that after tension was relieved they would be too loose to thoroughly control the vessels. Five or six large vessels were encountered. These were readily picked up with forceps and tied.

**Suture Material.**—In many of the reported cases catgut was used exclusively. In this case fine Pagenstecker thread, reinforced with catgut, was employed. Catgut is, of course, the material generally preferred, but where there are such large vessels and so much tension, sutures of silk or linen thread are, on the whole, more reliable; although the silk will gradually work its way out.

**Treatment of the Stump.**—After controlling all bleeding, it remains to deal with the raw area. Where the cautery has been used, one can not expect to bring charred surfaces together and get union. Again, only in very exceptional cases would it be possible to remove a large tumor and have such a satisfactory folding as in this case. As a rule, the cut surface must be left as it is. Some surgeons advocate stitching the omentum over it. Others close the abdomen without drainage. From a careful review of the cases I gather the impression that it is better to drain. Where this is done, bile is often found escaping through the wound from the cut surface of the liver for several days, and if the abdomen has been closed without drainage, this must of necessity flow into the abdomen. Keen has laid stress on this point, but says that the danger from absorption "seems to be more theoretical than practical." In this case an iodoform drain was carried to the under surface of the liver and another to the upper surface along the line of the sutures. Pfannenstiel<sup>9</sup> has called attention to the possible danger of using iodoform gauze where large areas of raw liver substance are left, and prefers sterile non-medicated gauze for this purpose.

#### COMPLICATIONS THAT MAY ARISE DURING AN OPERATION.

The operation is sometimes beset with many difficult-

8. In bleeding the uterus there is always free hemorrhage, especially in the case of a large myomatous organ. Dr. Kelly has taught that strong traction on each half almost completely checks oozing. This principle was applied to the distal segment of the liver with very satisfactory results. It must be said, however, that the liver substance removed with the tumor, in this case, was relatively small.

9. Pfannenstiel: Med. Centr. Ztg., Berl., 1898, lxxvi, 177-179.

ties. Where the tissue is very friable the sutures may cut through the liver substance. To overcome this difficulty Ceccherelli and Bianchi used decalcified bone plates over the upper and under surfaces and sutured through them. In some cases, after removal of a nodule from the center of the liver, when it was impossible to check bleeding by sutures, the cavity was packed with gauze, held firmly in place by sutures passed through the liver substance.

In other cases, where it was impossible to check oozing, a rubber ligature was firmly secured around the liver, slipping being prevented by means of two hat-pins passed through the organ at right angles to each other. The edge of the liver was then sewed to the peritoneum of the abdominal wound. In some of these cases the growth was cut away and the stump left to granulate up. In other instances the growth was left to slough away, the constricting band being tightened from time to time.

#### IMMEDIATE AFTER-RESULTS.

Hemorrhage is the most serious complication. It may take place after a few hours or at the end of a day or two. The employment of the suturing method of Kousnietzoff or Auvray or the overlapping mattress suture will undoubtedly render secondary bleeding far less frequent. Where hemorrhage occurs, however, the abdomen should be opened at once, for the patient is not always exsanguinated. If the bleeding points can not be controlled a rubber ligature should be applied and prevented from slipping by means of hat-pins. The stump can then be treated extraperitoneally, the edge of the liver being fastened to the peritoneum.

#### MORTALITY.

Terrier and Auvray collected 38 cases operated on for the following diseases: Sarcoma, 4; carcinoma (considered primary at the time of operation), 7; secondary carcinoma, 1; adenoma, 6; angioma, 4; tumors of an indefinite character, 3; gummata, 9; biliary cysts (non-parasitic), 4.

Of the patients, 32 recovered and 6 died. The deaths were due to hemorrhage, shock or sepsis. Keen has collected 74 cases. Some of these are included in Terrier and Auvray's lists. Sixty-three of the patients recovered and 11 died—a mortality of 14.9 per cent.

The causes of death were: Shock, hemorrhage and exhaustion, in 8 cases; septicemia, in 2 cases; pulmonary embolism, in 1 case.

In this group of Keen's are three of his own cases; all three patients recovered. As mentioned elsewhere, Mikulicz has had six cases with equally happy results.

**Patient.**—On Jan. 6, 1903, I saw Miss T., in consultation with Dr. E. B. Trippé. The patient was 30 years of age and of very slight build. For six months she had felt a small lump in the left side, but had hesitated to speak of it until a week previously. It was first noticeable in the region of the left kidney and at first had increased in size gradually, but later at a much more rapid rate.

**Examination.**—On examination the left renal region was found to be filled by a tumor which extended upward near the ribs, and downward almost to the pelvic brim. It was slightly movable.

**Operation.**—On January 8 an incision was made over the most prominent part of the tumor. This incision extended from the quadratus lumborum behind, obliquely downward almost to the median line just above the pubes. The tumor was everywhere firmly adherent and was liberated with a great deal of difficulty. Only at one point was there any escape of its

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Carl Beck	Med. Re xli, 385-3
Harris	Brit. M Lond.
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Giulio, F.	Poliella viti, Sc 240.
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James	Mon. S de Buc ii, 161-3
Thomson	Med. A 1899, xx
Nicholson	M. J., 8 ix, 427-4
Pfannen	Med. C Berl., 1 159.
Maresch	Zschr Wien xliiv, 3
Terrier	Revue lxviii, 5
Barkhoff	Arch. 1903, x
Cullen,	



## CASES OF RESECTION OF PORTIONS OF THE LIVER REPORTED SINCE 1889.

Reporter and Reference.	Sex.	Age.	Duration, Nature and Size.	Method of Removal.	Treatment of Liver Stump.	Result.	REMARKS.
Coel Beck; Chicago Med. Recorder, 1901, xli, 383-386.	Male.	20	Followed kick 5 years before. "Angio-adenoma" the size of man's head occupied the entire left lobe.	Controlled by rubber catheter, held by two hat pins through stump. Half the tumor removed, half left to slough off.	Extra-peritoneal . . .	Recovery . . . . .	Large an angioma, but with certain adenomatous areas.
Harrison; Brit. Med. Jour., Lond., 1903, ii, 18.	Male.	50	Pain after heavy lifting 11 years before. Angioma the size of a child's head.	Slightly adh. to abd. wall. Incised; pour. of 50-60 oz. blood. Tumor enucleated by dissecting; Volkmann's spoon. Bleeding controlled by sponge pressure.	Abd. closed without drainage.	Recovery . . . . .	Angioma partly calcified.
Dahlgren; Nord. Med. Ark. Stockh., 1902, 3, f. 4, No. 4, 1, 1, 24.	Female.	33	Over a year. Angioma 8 $\frac{1}{2}$ x 5 $\frac{1}{2}$ inches at front, larger than a fist—pedicle 6 cm. broad; 1.5-2 cm. thick.	Bleeding controlled by continuous catgut sutures. Tumor removed by cauter.	Omentum attached to stump.	Recovery . . . . .	Gives good résumé of the literature.
Macnaghten-Jones; Brit. Gynae. Jour., Lond., 1901-2, xvii, 40-43.	Female.	27	Over a year. Angioma, 3 $\frac{1}{2}$ x 8 $\frac{1}{2}$ inches at front. Irregular spaces lined by epithelium and filled with blood.	Tied by numerous ligatures; little bleeding.	Pedicle packed above and below with iodoform gauze.	Died 18 hours after operation.	Much shock at operation.
Guido; Filippini; Fellein-Roma, 1901, viii, Sez. Chir., 222-240.	Female.	22	Tumor of left lobe the size of an adult head, 20x15x3.6 cm.	Rubber ligature and sutures.	Attached to abdominal wall.	Recovery . . . . .	Angioma.
Guido; Filippini; Same reference.	Male.	42	Cancer of the liver involving the entire left lobe.	Rubber ligature . . . . .	Attached to abdominal wall and allowed to slough off.	Recovery . . . . .	Primary cancer of the liver.
Duret; Ass. Franc. de Chir. Proc. Verb. Par. 1898, xii, 363-371.	Female.	46	Six months. Carcinoma, 16 cm. in its greatest diameter.	Cut away as a wedge. Vessels controlled by a few sutures; raw surfaces approximated by continuous catgut.	Closed without drainage.	Recovery . . . . .	Gall-bladder contained calculi.
Jones; Bull. et Mém. Soc. de Chir. de Bucarest, 1902-3, v, 104.	Female.	41	Size of a small orange, adherent to the transverse colon.	Tumor resected; a modified Avray ligature employed.	Closed without drainage.	Recovery . . . . .	Thought to be syphilitic. Wound opened on 3d day to let out some blood. Growth first thought to be malignant.
Haidich; Annals of Surgery, 1904, xxxix, 290.	Female.	26	Eight months. Gumma, the size of a large orange.	Removed by blunt dissection with scissors.	Hot saline. Gauze checked oozing. Surfaces approximated by deep catgut sutures. Drainage.	Recovery . . . . .	No bleeding.
Léonté; Bull. et Mém. Soc. de Chir. de Bucarest, 1900-01, vi, 163-164.	Female.	30	Adenocarcinoma in the right lobe, the size of a lemon. Weight, 843 grams.	Sutures placed; tumor removed.	.....	Died in 24 hours. Anuria from renal disease.	No bleeding.
Thompson; Tr. Texas Med. Assn., Austin, 1899, xxxi, 245-253.	Female.	30	Gumma, size of a small orange; occupied parts of both lobes.	Tumor removed with scissors; transfixed by two needles at right angles. Appl. of rubber.	Fasted to abdominal wall. Infection.	Recovery . . . . .	Histologic examination showed gumma.
Nicholson; Interstate M. J., St. Louis, 1902, ix, 427-430.	Male.	36	3 $\frac{1}{2}$ inches broad; projected 3 inches from surface of liver.	Cut out with scissors; vessel openings closed with chromicized catgut.	Packed with gauze; partially removed 2d day, some bleeding. Removed 4th day; edge of abd'l wound repaired and closed.	Recovery.	
Flannestein; Allg. Med. Centr. Zig. Berl., 1888, lxvii, 177-179.	Female.	19	Growth noticed years before. About 12 pounds. Abd. before operation, 116 cm. in circumf., considerably more than that of a pregnant woman at term). Tumor pale white, "alabaster-looking," fluctuating—sprang from under surface of left lobe. On section composed of large and small blood spaces—some spaces as large as walnut others as big as an apple. Micro. exam. showed growth to be an angioma.	A furrow made in liver substance both anteriorly and posteriorly at base of growth. Tumor then shelled out partly by cauter, partly by blunt dissection—bleeding vessels controlled by catgut passed with a Deschamps needle; in part by pressure, in part by strong traction on tumor. Some broad clamps applied, stump about 15 cm. broad thus produced—tied with about 20 catgut sutures; tumor cut away with cauter.	Large funnel-shaped stump left, attached in upper angle of abdomen wound. Packed with sterile, non-impregnated gauze. Length of operation 15 hours. Pulse at end, 120-140. Discharge at first, bloody; later, bile.	Recovery . . . . .	Resembled an ovarian cyst, but on vag. exam. uterus and appendages were clearly outlined. The continual traction of tumor had probably rendered the liver substance of pedicle firmer than normal. Very little urine at first, probably from great loss of blood; salt sed. given freely.
Maresch (Hochenegg); Zisch; F. Heilk., Wien, Leipzig, 1893, xlii, 39-50.	Female.	53	Three years; at first slow, by later rapidly. Abd. greatly distended. Lymphatic glands enlarged. Colic. Peritonaeum drawn back. Tumor dissected out bluntly with forceps and elevators. Tremendous bleeding from torn vein. Abd. full. Firm pressure made. Hem. controlled with catgut sutures and needle.	Punctured, supposedly an ovarian cyst; pedicle about 5 cm. Colic of peritonaeum drawn back. Tumor dissected out bluntly with forceps and elevators. Tremendous bleeding from torn vein. Abd. full. Firm pressure made. Hem. controlled with catgut sutures and needle.	Incision 6 cm. long made toward right abdomen wall, 3 cm. below the xiphoid. Pedicle of tumor sewed into this transverse incision. Original incision then closed.	Recovery; discharged on 21st day.	Supposed to be an ovarian cyst.
Terrier et Avry; Revue de Chir., 1898, xviii, 719.	.....	50	Cancer the size of a closed fist, probably secondary to growth in bowel. Adherent.	Cut sutures of Avray. One vessel tied free-hand.	Packed with gauze.	Recovery . . . . .	Fistula still remaining; silk sutures came out gradually.
Barckoff; Russ. Chir. Arch., St. Peterb., 1900, xix, 20-22.	Female.	40	Ten years; the size of a hen's egg; oval and yellow.	Cut out elliptical depression approximated with catgut. No hemorrhage.	Closed without drainage.	Temporary recovery.	Echinococcus.
Collen; Thomas S. . .	Female.	30	Recognized less than a week before operation. Adenocarcinoma of liver, secondary to primary growth in left kidney. Growth size of child's head. (Fig. 5.)	Cut away with knife after application of mattress sutures. Raw surface approximated. (See Fig. 7 in text.)	Isoform gauze drainage.	Patient in good health 8 mos. after operation.	Evidence of return in scar where left kidney was removed nearly 2 years ago.

contents. Here the capsule had broken slightly, allowing the escape of a small amount of friable, carcinomatous-looking material. After liberating all adhesions and tying every bleeding point with catgut the renal vessels were exposed and tied first *en masse*, and then singly. The abdominal cavity was opened in several places as the tumor was intimately blended with the peritoneum. We were, however, able to protect the abdomen from infection. The muscles were brought together with silver wire, the skin with silkworm gut. The patient, although much shocked, gradually recovered. Her temperature rose on one occasion to a little above 100 F. She made an uninterrupted recovery and left the hospital at the end of the fifth week.

**Result.**—On March 9, 1903, I received a letter from the patient saying she was very much improved; the wound had healed entirely and she was feeling much stronger. I saw her from time to time and she showed continued improvement and regained perfect strength.

**Subsequent History.**—On June 2, 1904, I received a message from Dr. Trippe saying that the patient was not so well and that her temperature was 102.5. Five days previous to this the patient had noticed a small lump just below the free edge of the ribs on the right side. At first it gave her no concern, but apparently doubled<sup>10</sup> in size within two days and during the following two days again showed marked enlargement.

**Examination.**—When I saw her it occupied the region between the edge of the ribs and the anterior superior spine. It was round, tense and somewhat movable. We were very careful in our examination, fearing that it might be a friable secondary growth following the removal of the large carcinomatous kidney in January, 1903. Her pulse was rapid; her temperature was 102.5 F.

**Operation.**—As she was losing ground rapidly an immediate operation was decided on. An incision having been made over the tumor, it was found to be perfectly smooth and free from adhesions. The incision was continued upward to the free margin of the ribs (Fig. 5) and downward almost to the anterior superior spine. The growth proved to spring from the liver; it was larger than a child's head and was almost globular in form. The edge of the liver appeared as a slightly elevated ridge, forming a crescent over the center of the anterior surface of the growth. Attached to the inner side of the growth was the gall bladder. I carefully examined the liver, but failed to find any secondary growths and also was unable to detect any evidence of metastases in the abdominal organs or any thickening in the renal region on the left side. The right kidney was about half as large again as usual, and was perfectly normal, considering the absence of the other. The urine, however, contained some pus and a little blood. On careful examination it was impossible to determine whether we were dealing with a cystic new growth or an abscess formation. In the former case we were at a loss to tell why there had been as yet no adhesions and why the surrounding liver substance was so firm. On the other hand, it was difficult to account for the elevation of temperature if no abscess was present. After some hesitation we decided to remove the growth together with a small portion of healthy liver substance. The gall bladder was exposed, the cystic duct clamped and cut and the proximal portion of the duct tied off. The lower half of the liver could then be readily drawn out through the abdominal incision. It was everywhere walled off from the abdominal contents by gauze, and a gauze rope was securely fastened around the liver about an inch above the point at which the cut was to be made. A cautery was called for, but—fortunately, as after results showed—the instrument would not work. I then took a long, blunt needle and, starting from left to right, passed mattress sutures through the entire substance of the liver. These were about 1 cm. apart and each one overlapped the other for about 2 or 3 mm. The greater number of sutures consisted of Pagenstecher thread,

the supplementary ones being of catgut. After placing two or three mattress sutures I commenced to cut, the tumor at the same time being held taut. The sutures were then tied. This process of applying sutures and cutting and then tying was continued until the entire growth had been removed. Five or six large blood vessels were encountered, which spurted freely. These were picked up with artery forceps and tied freely with fine Pagenstecher thread. The entire growth was removed without the loss of more than two drams of blood. After the sutures had been tied there was absolutely no bleeding from the surface. After removal of the growth there remained a raw surface fully 16 cm. in length and 6 cm. in breadth. On making traction on the sutures I found that the raw surface could be rolled in on itself so that the two halves formed flaps. These were brought together, until little or no raw substance remained. The ends of the sutures that had already been tied were utilized to bring the opposite sides together. Iodoform gauze was placed beneath the edge of the liver and also on its surface. Although the patient was apparently in a desperate condition when she went on the table, she stood the operation well, and when she was taken from the operating room her pulse was only 104. On the next day her temperature dropped to 100 F. The general condition was excellent and the pulse 84. To look at her one would hardly have realized that any operation had been performed. She made a rapid recovery and left the hospital in about four and a half weeks.

**Result.**—I saw her on Aug. 4, 1904. She was looking very well and had regained her color; the wound had practically healed. She had little or no pain. On the left side there were areas of suspicious thickening in the old renal scar.

**Note of Sept. 7, 1904:** On examination some of the liver sutures are seen working their way through a small sinus. They are giving no trouble, however. The patient is up and around, apparently in good health. On the left side along the linear incision, where the kidney growth was removed a year and a half ago, several nodules are felt. These are rapidly increasing in size. One of them is fully 6 cm. in diameter and has already become slightly attached to the skin. It is bluish in appearance.\*

#### PATHOLOGIC REPORT OF KIDNEY.

Miss T. Pathologic No. 6364. The specimen, roughly speaking, is kidney-shaped, irregular in outline and covered by many adhesions. It measures 20x13x12 cm. Attached to the lower end is the ureter, which is about 4 mm. in diameter. On palpation the tumor seems to be cystic. This condition is more noticeable at the upper pole. Toward the lower end the growth is firmer. On section little or no renal tissue is demonstrable. The tumor has a capsule varying from 2 to 5 mm. in thickness. Passing off from this capsule into the tumor are many connective-tissue partitions which divide the growth into large and small nodules. The greater part of the tumor is soft, and consists of a spongy-looking material resembling carcinoma. The more solid portions of the growth are homogeneous. At numerous points there has been disintegration of tissue. The growth, as a whole, is yellowish-white in appearance, but where degeneration has taken place the tissue is of a bluish tinge or is distinctly yellow.

**Histologic Examination.**—The capsule is composed of fibrous tissue, sharply outlined from the tumor, which is made up of a glandular growth. The gland type is particularly well marked. There are long stems carrying delicate blood vessels and covered by a single layer of epithelium. Passing off everywhere from these stems are secondary stems, likewise covered by one layer of epithelium. The epithelial cells are low cylindrical or cuboidal in type. Their nuclei are round or oval and stain fairly deeply. In many places a definite glandular arrangement is visible, but the tendency toward the papillary

\*Feb. 24, 1905: Dr. Trippe informs me that from time to time a few stitches have come away from the liver, but have occasioned absolutely no inconvenience. The nodules in the elatrix in the side where the kidney was removed are somewhat larger, but they do not seem to cause her any inconvenience. "Her general condition seems to be very good."

10. The tumor had evidently existed for a considerable length of time, but was not recognized until it was suddenly forced from beneath the ribs on account of its increasing dimensions.

formation is everywhere in evidence. Here and there nuclear figures are visible. The specimen was hardened *en masse*; consequently one would not expect to find many cells undergoing division. In the older portions of the growth the cells have so multiplied that they form a homogeneous mass. At many points coagulation necrosis has taken place and the cells do not stain at all. Such an area, as a rule, is entirely devoid of infiltration, but here and there are aggregations of polymorphonuclear leucocytes. At some points are masses of bright orange pigment, evidently a result of old hemorrhages. Such masses have a fuzzy appearance and closely resemble the outer covering of a chestnut. The specimen is undoubtedly from an adenocarcinoma. The cells of this growth bear a striking resemblance to those of the collecting tubules of the kidney. Sections of the ureter just below the pelvis of the kidney show that it is perfectly normal.

#### PATHOLOGIC REPORT OF LIVER TUMOR.

The specimen consists of a tumor removed from the lower portion of the liver. Attached to this are the gall bladder and a small amount of normal liver substance. The tumor is 16 cm. long, 14 cm. broad and 13 cm. in its anteroposterior diameters. It is slightly lobulated, has a smooth surface and appears gradually to blend with the healthy liver substance. Passing over the middle of the lower surface of the tumor is a thin strip of liver substance representing all that remains of the lower edge of the liver. The raw surface corresponding to the liver attachment is 16 cm. in length, 6 cm. in breadth. The liver tissue is apparently normal. The growth on palpation seems to be filled with thick fluid contents and strongly suggests an abscess.

The specimen was hardened in alcohol before being opened. It is surrounded by a capsule 1 to 2 mm. thick. The interior is composed of a very soft homogeneous substance. In the outlying portions, however, it is rather spongy. In the hardened specimen the growth presents a mottled appearance; in places it is reddish-blue, at other points yellowish-white in color. Only a small amount of healthy liver substance is present. The gall bladder is firmly attached to the upper and inner side of the growth and measures 7 cm. in length, 3 cm. in breadth.

To describe the histologic appearance of this tumor would be to repeat what has been said of the histologic appearance of the kidney. It is identical in every particular. In other words, it is an adenocarcinoma secondary to the primary growth in the kidney. It also contains numerous areas of degeneration.

In 1892 T. S. Westcott tabulated 20 cases of partial resection of the liver for Dr. Keen. A second article by Keen, in 1897, contained a tabulation of Cases 21 to 59 by G. W. Spencer. For Keen's article, published in 1899, H. H. Cushing and M. L. Downs have tabulated all additional cases to that date. The accompanying tabulation includes the cases that I have been able to gather from the literature since 1899; for convenience the lines laid down by Keen have been followed.

This case is unusual for the apparently rapid development of the hepatic growth, the symptoms being of less than a week's duration. It is further unusual to find a single metastatic nodule in the liver following a primary growth in the kidney.

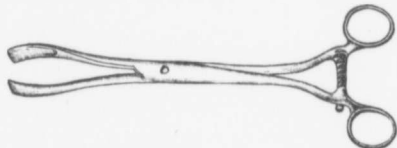
Considering the fact that the patient had only one kidney, that the urine contained blood and pus, that the temperature was 102.5 F., and the physical condition poor, I advised letting the growth alone. Dr. Trippe, who was not only the patient's physician, but also a near relative, on the grounds that her condition was rapidly growing worse and that she could not last many days, insisted on its removal. That he was right is clearly shown by the temporary recovery of the patient, and I freely confess that any credit for the operation is due entirely to him. Certainly no case that I could find in the literature offered less prospects of even a temporary success, but Dr. Keen, when reporting his last case, said: "After my experience with these three cases I should hardly hesitate to attack almost any hepatic tumor without regard to its size."

## UTERINE ELEVATOR FORCEPS.

THOMAS S. CULLEN, M.B.  
BALTIMORE.

When dealing with adhesions in the pelvis, it is often necessary to draw the uterus upward and forward so that the adhesions can be cut under guidance of the eye. Traction may be made by grasping the round ligament, the margin of the tube or the utero-ovarian ligament with artery forceps, but in inflammatory cases the tissue is peculiarly prone to tear and considerable bleeding is liable to follow if much traction be made. The uterus may be grasped with bullet forceps. These are apt to tear out if much traction be exerted, and, even if they do not, subsequent bleeding from the points where the instrument grasped the organ is a source of annoyance and several sutures are often required to check it.

About two years ago, I had forceps made that obviate most of these difficulties. One might very well speak of the instrument as a "cross" between obstetrical and artery forceps. The handles are those of a pair of artery forceps, the blades are



nearly an inch broad and viewed from the inner surface are concave from side to side and from above downward. In other words, they are so formed that they will accommodate themselves to the general contour of the uterus, and if tightly applied will hold the organ firmly. If the forceps be snugly applied to a thumb, it is impossible to withdraw it and yet at the same time no pain or unnecessary pressure need be felt. The forceps may be fenestrated if desired.

The traction forceps have the following disadvantages: 1. They sometimes slip off, especially if the uterus be infantile. 2. It sometimes requires both hands to apply them.

In the two years I have, on the whole, found them very satisfactory. Even when dealing with the large, boggy uteri, which bleed so readily, there has been no injury nor subsequent bleeding, save in one instance, where a slight abrasion occurred. Often in such uteri a depression fully 3 mm. is made by the forceps, but in a few minutes all trace of it has disappeared.

When suspension of the uterus is advisable the sutures can be easily placed through the fundus between the blades of the forceps.

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JOHNS HOPKINS MEDICAL SOCIETY.

*January 8, 1906.*

JOHNS HOPKINS MEDICAL SOCIETY.

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Report of Cases. DR. THOMAS S. CULLEN.

CASE I.—*Early Tuberculosis of the Kidney.—Diagnosis* (150)  
*of the tuberculous process made from thickening of the ureter  
detected on vaginal examination.*

Miss E. Q., aged 24, seen in consultation with Dr. Fenby and admitted to the Johns Hopkins Hospital, October 26, 1905. The patient complained of pain on urination. The family and personal histories were not important, except that she had been suffering with diarrhoea and complained of slimy stools with pain in the rectum on defecation. She had had dysmenorrhoea.

*Present trouble.*—For eight months she has had pain at the end of urination. This is her chief complaint at present. At first the pain was cutting and almost intolerable. At present she has to void small quantities every ten or fifteen minutes. There is no history of hæmaturia. Five or six days before admission her trouble became very acute and she noticed shreds in the urine. Recently she has had chills and fever. She has always had pain and tenderness on the left side just above the hip and in the flank.

*General examination.*—The heart action is weak and irregular. The lungs are clear.

*A cystoscopic examination* shows well-defined ulcers scattered throughout the base of the bladder; in numerous places near the ulcers are small tubercles. The inflammation is especially noticeable around the left ureter. The urine contains pus, but no tubercle bacilli can be detected. On

(150) further examination the left ureter can be palpated through the vagina, and is recognized as a hard pencil-like cord passing upward along the left side of the pelvic wall.

*Operation, October 28, 1905.*—Left nephrectomy; partial ureterectomy. On cutting down on the kidney the capsule was found adherent and definite tubercles were easily made out.

After tying the renal vessels separately the ureter was freed as far as possible, but as the patient's pulse was 140 when we started and became weaker it was impossible to take time enough to remove the entire ureter. The ureter was freed as far as the pelvic brim, tied with Pagenstecher thread, and then cut across with the Paquelin cautery. A small drain was inserted. The patient did well after operation and rapidly grew stronger, although she had intense bladder pain.

*Second Operation, November 11.*—Ureterectomy. Cystoscopic examination still showed considerable cystitis, but there had been a moderate improvement. It was consequently decided not to make a vesico-vaginal fistula, but rather to see if the bladder symptoms would not clear up after removal of the ureter. An incision was made parallel to Poupart's ligament, from the anterior superior spine almost to the symphysis. A gridiron incision was made in the muscles and the peritoneum pushed toward the median line. The thickened ureter immediately came into view. The upper part was loosened without much difficulty. The ureter was freed down to the uterine vessels. The uterine artery and veins were then tied on both sides and cut as in a Wertheim operation. An artery clamp was then introduced into the vagina and pressed upward. It was seen that nothing but the vaginal mucosa lay between the field of operation and the vagina. The forceps was then cut down upon, the vagina opened, and the ureter drawn through into the vagina. The lateral incision was now partially closed. After a small drain had been carried down to the bottom of the incision the ureter was excised. Where cut across it showed no thickening. There was a slight leakage from the vagina for several days.

November 25.—The patient still has dysuria, but her <sup>(150)</sup> general condition is greatly improved.

January 6, 1906.—During her stay in the hospital she gained fifteen pounds and at present looks very well. Micturition is still frequent and last night she had to get up at least eight times. There is now much less tenesmus, whereas formerly just a few drops of urine in the bladder were sufficient to bring on a desire to void. The site of the left ureteral orifice looks puckered. From the right ureteral orifice spurts of urine can be seen and a tendency to eversion of the ureter. The bladder mucosa looks somewhat injected but the ulceration has apparently disappeared.

*Pathological report.*—The kidney is normal in size. At its upper pole there is an area of softening, 2 by 3 cm. At this point beneath the capsule numerous fine yellowish-white tubercles are detected. On section the capsule of the kidney can be easily stripped off. Near the point at which the tubercles were noted is a cavity 2.5 by 2 cm. Lining this are numerous minute tubercles. The cavity is filled with a rather grumous material. The cortex between the cavity and the surface is everywhere studded with tubercles. The greater part of the kidney is comparatively free from the growth, but near the middle a few isolated tubercles are visible, and at the lower pole several can be detected. A small portion of the ureter is present. It is 6 mm. in diameter and very firm. <sup>(151)</sup>

On *histological examination* of the area where the tuberculosis was macroscopically unmistakable there is a great deal of alteration. The tissue is markedly infiltrated with small round cells. There is an obliteration of the usual landmarks and many tubercles are seen, sometimes lying in groups of epithelioid cells; in other places are large masses of epithelioid elements. There is little tendency toward the formation of giant cells. In some places the process has gone to caseation. The wall of the cavity in the upper part of the kidney is composed essentially of tuberculous tissue, and the cavity itself contains quantities of polymorphonuclear leucocytes.

The outer coats of the ureter are for the most part normal. Here and there, however, a small tubercle is seen. The tissue



(151) directly beneath the mucosa shows slight invasion with tubercles, but the epithelium lining the ureter is intact. Sections from the lower part of the ureter show that the epithelium has entirely disappeared, the cavity being lined almost entirely by typical tuberculous tissue.

This case demonstrates very well the pronounced vesical symptoms which can exist with a very small amount of renal tuberculosis and the great disintegration of the ureter that may take place when so little renal substance is implicated.

The cord-like ureter detected on vaginal examination is practically pathognomonic of tuberculosis of the kidney even without an examination of the bladder or of the urine.

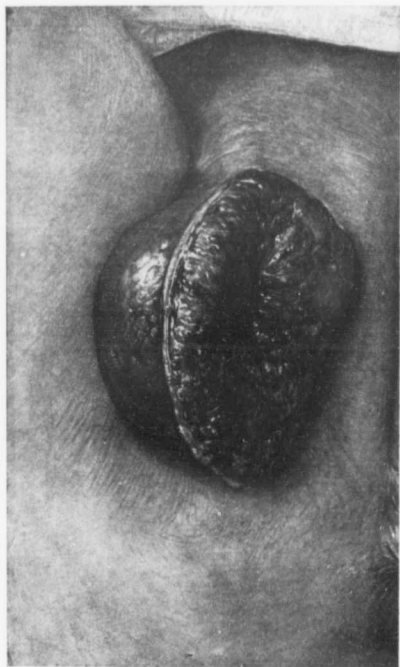
*CASE II.—A very rapidly growing squamous-celled carcinoma of the inner side of the thigh.*

*Gyn. No. 12,330.* Mrs. B. F. Admitted to the Johns Hopkins Hospital August 29, 1905, complaining of a lump in the right side of the thigh. The patient is 53 years of age, white. The menopause occurred at 52, a year before the onset of this trouble. The patient has been married 29 years; had one child 28 years ago, no miscarriages. Ten years ago she noticed a pimple in the groin. This has been growing larger ever since and recently there has been a watery discharge from it. Pain has sometimes been present when she was sitting up. The tumor had increased only gradually, but since the last fourteen days the growth has been very rapid. The ulcerated surface is painful to the touch; the non-ulcerated or outer portion is not.

*Operation September 24.*—Excision of the fungoid tumor. The tumor was carefully covered over with gauze, then drawn up and excised without exposing the area of ulceration. There was little or no bleeding. The tissues were brought together with ease.

*Oct. 17.*—Patient discharged. Incision well healed. The outlook is of course most gloomy.

*Path. No. 8194.*—Just to the right of the vagina with its long axis parallel to that of the vulva is a somewhat pedunculated tumor which rises about 6 cm. above the skin. It is 8 cm. in length, 4 cm. in breadth. Its outer surface, that is,



CASE II.—A very rapidly growing squamous-celled carcinoma of the inner side of the thigh.

(151) the portion nearest the thigh is covered with brawny, glistening skin, bluish-purple in appearance. The inner or median half is ulcerated and presents a most sickening appearance; the color is reddish-blue, greenish, or yellow; the picture varying greatly in different parts according to the amount of discharge and the distribution of the areas of necrosis. On its surface as one passes up toward the inguinal region the tissue is somewhat raised, has a reddish hue and there has evidently been an infiltration of the lymphatics upward toward the inguinal glands on the affected side.

On *histological examination* the skin a short distance from the growth is unaltered. In the vicinity of the growth it shows a definite tendency to project downward, although the individual cells still retain their usual appearance. The underlying connective tissue, however, shows a great deal of infiltration with small round cells, particularly abundant along the course of the blood-vessels. The growth itself is made up entirely of epithelial cells. These have vesicular nuclei. They are not, however, uniform in size. There are masses of protoplasm containing two, three, or more nuclei. Nuclear (152) figures are abundant and here and there are masses of deeply staining chromatin. The nuclei are sometimes so arranged as to form large mulberry-shaped masses. The growth is a very cellular one. There is very little intervening stroma. Scattered abundantly throughout the superficial portions of the growth and also at various places deeper down are large numbers of polymorphonuclear leucocytes. The superficial portions of the growth have undergone complete necrosis. There are fragmentations of nuclei and deposits of fibrin.

*Diagnosis.*—A very rapidly growing squamous-celled carcinoma on the inner side of the thigh.

CASE III.—*Early tuberculosis of the appendix.*

Mrs. D. Seen in consultation with Dr. Mayer, September 8, 1905. The patient is 30 years of age and has had several definite attacks of appendicitis within the last year. I saw her in a subacute attack with the temperature just a little above normal, pulse normal, but a definite tenderness over the

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appendix. On opening the abdomen we found the appendix (152) partly bound down by adhesions. At its center was a swollen patch that formed a ring around the appendix. The right tube and ovary were partially bound down by adhesions. The pelvis was filled with clear fluid. We did not obtain any history of tuberculosis.

*Path. No. 9040.*—The appendix is bulging at the tip. There is some injection of the vessels. Apart from the annular thickening and the slight bulging at the tip little was to be made out macroscopically.

*Histological examination.*—The surface is covered with quite a number of adhesions which are recent and very vascular. In one of the adhesions is a typical tubercle. The muscular walls are for the most part normal, but at one point a tubercle is to be seen. Scattered throughout the lymphoid tissue are many tubercles, some of them typical, others consisting of epithelioid cells; at numerous points caseation has already taken place. The mucosa of the appendix is for the most part intact and normal. The lumen of the appendix contains a great number of polymorphonuclear leucocytes, and in the wall of the appendix, at one point, is a fairly large abscess.

In this case we did not for a moment suspect tuberculosis. Such instances emphasize the necessity for a routine histological examination in all cases. On questioning the patient carefully after operation we learned that she had been under treatment within the last year for incipient tuberculosis of the left lung.

*CASE IV.—Tuberculosis of the appendix, caecum, colon, and small bowel.*

Mr. M. Seen in consultation with Dr. Mayer and admitted to the Church Home, November 13, 1905. The patient is 34 years of age and for several months has been under the care of Dr. McConachie for ulceration of the larynx. His symptoms were relieved, but the exact cause was not determined. The patient has also been suffering from tuberculosis of the left lung. During the last six weeks he has lost twelve pounds

(152) and has complained of a great deal of pain in the pit of the stomach. On palpation a definite thickening can be made out over the pyloric orifice. He has had some fever. Yesterday it was 102° F.

It was deemed wise to do an exploratory laparotomy. An incision was made over the appendix as there was also some thickening at that point. The appendix was found to be more than twice its natural size. The cecum in the vicinity showed much induration, especially around the base of the appendix. The area of thickening detected on clinical examination proved to be in the transverse colon. Here over an area fully 5 cm. long the bowel was greatly thickened. Over its surface was a leash of blood-vessels, and beneath its peritoneum a few definite tubercles could be detected. On further examination I found that the small bowel at intervals of from six to eight inches was encircled by bluish-red areas fully 1.5 cm. in breadth—annular ulcerations. These were abundantly dotted with small tubercles and along their blood-vessels were little beads of tubercles. In many places along the convexity of the intestines were little streaks, evidently dilated lymphatics. It looked very much as if one had gone over the surface here and there with a fine brush and white fluid making delicate streaks. All gradations of the early tubercles could be detected, but at no point was there evidence of caseation. We removed the appendix and closed the abdomen. There was no apparent involvement of the omentum or of the abdominal peritoneum. The patient improved very much. His temperature remained normal for at least a week. Later on he was put on tuberculin. Just prior to leaving the hospital his temperature again arose and he rapidly lost ground.

*Path. No. 9209.*—The appendix is 6 cm. long and varies from 7 to 12 mm. in diameter, the end being considerably distended and blunt. It is covered with delicate shaggy adhesions and its vessels are very much injected. At no point is there any evidence of stricture. On section the lumen is found to be filled with greenish pus. The walls of the appendix are thickened. The mucosa is much infiltrated and the specimen is somewhat suggestive of plastic tuberculosis.

On histological examination numerous old but very vascular adhesions are seen on the outer surface. They contain quantities of small and several large blood-vessels. The muscular walls show infiltration with small round cells. Scattered throughout the lymphoid tissue are many typical tubercles. The mucosa at numerous points is intact, but in other places has disappeared, the inner surface being represented by caseous material. The lumen of the appendix is practically filled with polymorphonuclear leucocytes.

CASE V.—*The right ovary in the abdominal scar following an operation for appendix abscess.*

Mrs. G. Seen in consultation with Dr. Savage, October 9, 1905. The patient complained of bulging in the scar remaining from a former appendix incision and of a sensation of weight in the lower abdomen. The family history of weight in the lower abdomen. The family history was unimportant. Ten years ago she was operated on by Dr. Kelly at the Johns Hopkins Hospital for a pelvic abscess which was opened into through the vagina. The condition was a very serious one and she was compelled to remain in bed for three months. The second operation was performed shortly after by Dr. J. G. Clark, for an appendix abscess. It was necessary to provide for free drainage and it was between three and four months before the patient regained her strength. Ever since then it has been necessary for her to wear a bandage, and at times there has been an apparent puffiness and tenderness in the abdominal scar. In the right lower quadrant of the abdomen is the scar of the appendix operation. It is about six inches in length. In the middle of the scar there is a small area of tenderness. The tissue here can be pushed in to some extent. In the lower part of the incision is a definite and sensitive thickening. On examination under anesthesia I found along the appendix scar definite points of thickening and at the lower end a nodule fully 5 cm. long by 2 cm. broad. This was firmly adherent to the skin and felt very much like the thickened omentum. On resecting the old scar and entering the abdomen we found what at first appeared to be an adherent omentum was in

(153) reality a large cystic ovary which lay directly beneath the skin. Attached to it was a hydrosalpinx fully 1.5 cm. in diameter. The omentum had come down and had become adherent to the bladder, anterior abdominal wall, and the ovary. We loosened the omental adhesions to the ovary, but in order to avoid leaving fresh raw areas we left the omental adhesions to the bladder and abdominal wall as they were comparatively smooth. After controlling all oozing on the right side we loosened up the left ovary which was embedded in adhesions to the pelvic floor and to minimize the possibility of infection we placed a gauze drain in the pelvis and brought it out through the vagina. The abdomen was closed without drainage. The patient made a very satisfactory recovery.

*Path. No. 9184.*—The specimen consists of a tube and ovary. The ovary is practically normal in size and is covered everywhere by adhesions and contains several small Graafian follicles, and a partially organized corpus luteum. The tube is also covered by adhesions.

Microscopically, neither tube nor ovary shows anything abnormal.

*CASE VI.*—*An obscure abdominal tumor in the right upper quadrant consisting of an elongated right hepatic lobe, a prolapsed right kidney, and an appendix adherent to the gall-bladder.*

*Gyn. No. 12521.*—Mrs. A. D. Age 60. Patient of Dr. Singewald. Admitted to the Johns Hopkins Hospital, November 16, 1905. This patient entered the hospital complaining of pain in her right side. Her family and previous history are negative. Her menses ceased at 44. Married twenty-eight years; has had twelve children. About two years ago the patient noticed a fullness after eating, and one year ago a swelling in the right side just below the ribs. This has persisted, and she thinks it has become larger and lately has been growing rapidly. The increase in size has been accompanied by some pain and a feeling of pressure. She has been able to walk around the house, but cannot stand much exertion. Pain prevents her from lying down on the right side; she is most

comfortable on her back. After eating she has noticed a <sup>(150)</sup> good deal of discomfort in the right side. Has not lost in weight or in strength. Dr. Rushmore on examination found a cyst-like mass in the right flank which was indistinct; the movements are restricted and the growth does not extend into the pelvis. The vaginal examination yields practically nothing.

*Operation, November 18, 1905.*—On examining the patient under anaesthesia I readily made out a large firm mass occupying the right upper quadrant of the abdomen. The mass, however, had a rounded contour and extended within 3 cm. of the median line anteriorly, downward it could be traced to a point about 4 cm. below the umbilicus. It was impossible to tell whether we were dealing with a renal tumor, a growth from the bowel, or with some pathological condition implicating the liver or gall-bladder. A small opening was accordingly made through the right rectus to determine the exact condition. On opening the abdomen it was found that a part of this mass was due to a prolapsed and somewhat thickened right lobe of the liver. The posterior portion of the mass was formed by the prolapsed right kidney; and lying in between and extending up along the under surface of the liver for at least 5 cm. was the appendix. This was considerably thickened and adherent to the gall-bladder and cystic duct. The adhesions were gradually liberated, and the appendix was removed without difficulty. The patient stood the operation well.

*November 26, 1905.*—The patient is in excellent condition.

*Path. No. 9229.*—The specimen consists of the appendix which apart from a few adhesions appears perfectly normal.

*Histological examination.*—Attached to the outer surface are several dense and very vascular adhesions. The muscular walls are normal and the mucosa is unaltered.

In this case the symptoms were undoubtedly due entirely to the tugging of the appendix adhesions as evidenced by the fact that the discomfort has entirely disappeared, notwithstanding that the tumor consisting of the right lobe of the liver and the prolapsed right kidney still exists.



(153) CASE VII.—*Abscess between the abdominal peritoneum and omentum four weeks after labor. Involvement of the lower edge of the liver. Opening of abscess; secondary exploration in region of liver with marked tearing of the friable organ. Hemorrhage controlled with blunt liver needles. Complete recovery.*

*Gyn. No. 12456.*—A. M. Seen in consultation, October 20, 1905, and at once admitted to the hospital. She is 36 years of age, married, white. Her family and previous history are negative. She complains of a good deal of abdominal discomfort and of fever. The patient has been married seventeen years, has had ten children, the oldest 14 years, the youngest born September 19, 1905, just one month before admission. Her labors have all been difficult and instrumental. On several occasions there was tearing. Four years ago her perineum was repaired at this hospital. For several days prior to her labor in September she had been in bed with a fever. The delivery was instrumental. The labor was followed by a most profuse hemorrhage. Fever and chills continued for four days after delivery. Ever since that date she has had chills and fever and a marked pallor has been noted. On admission to the hospital she was extremely anæmic; hæmoglobin 26 per cent, leucocytes 11,200. There were distinct hæmic murmurs, but the heart was otherwise normal; the lung sounds were normal. The right eye was inflamed. A white scar was visible on the cornea and a definite purulent exudate was made out. The abdomen was distended and just to the left and above the umbilicus there was a definite area of bulging. Just to the left of the umbilicus and corresponding to elevations was an indurated area, 2.5 inches in diameter. This was somewhat tender. The lower part of the abdomen was hard, and suggested the existence of a large abdominal tumor. There was no reddening. There was more or less tenderness over the entire abdomen especially over the small tumor elevation noted on the left side. On pelvic examination nothing could be detected. The cervix was high up. The uterus was movable. On both sides the appendages were perfectly free.

*Operation, October 21.*—An incision was made over the hardened and indurated area on the left side. On passing down to the peritoneum we encountered a large abscess containing foul-smelling whitish pus. On careful exploration the cavity was found to continue upward almost to the free margin of the ribs and downward to within about 8 cm. of the pubes, but apparently lay between the anterior abdominal wall and the omentum. No intestines or abdominal contents were to be seen. The cavity was loosely packed with iodoform gauze and the patient left the table in a precarious condition. Cultures from the pus showed no growth. Anaerobic cultures were not made. For a few days large quantities of pus were discharged. Her temperature kept up and she became delirious and had to be taken to the isolation ward.

On *October 3*, the hæmoglobin was 25 per cent, the leucocytes were 15,200.

*November 4*, the patient was brought down to the operating room as her condition was not progressing satisfactorily. We could detect an area of induration along the free margin of the ribs on the right side. Artery forceps were introduced in the previous opening and carried up to where the induration was detected on the right side. We then cut down upon the indurated area in the flank. An incision was made on the outer side of the rectus; the peritoneum was found thickened. There was much œdema in the sub-peritoneal tissues. The liver was found lying just beneath the incision and appeared to be necrotic; it broke up very readily under the examining finger and there was free hemorrhage. The insertion of three or four cat-gut sutures, however, with the blunt needle checked the oozing. We drained down to the edge of the liver and also repacked the large abscess cavity. Apparently the abdominal abscess had its origin from the gall-bladder or had been a primary liver abscess, but in no way involved the pelvic organs and had apparently been almost entirely anterior to the omentum. The patient gradually improved. The temperature dropped from 102 to 100° F. The appetite also improved.

*November 20.*—She was taken out of doors although her

(154) condition was still rather precarious. From this time her mental condition rapidly cleared up and a decided improvement was noted each day and she was discharged on December 21 with the abdominal wound completely closed; there was no tenderness at any point, the hemoglobin was 76 per cent and the mental condition was perfectly satisfactory.

CASE VIII.—*The velvet feel of an unruptured tubal pregnancy.*

E. P., colored, aged 30, married, was admitted to the Johns Hopkins Hospital, September 19, 1905. She has been complaining of uterine bleeding, and pain in the back and right side for seventeen days. Her family and previous history are unimportant. The menses began at fifteen. For two years they were regular without pain, later the periods became painful and lasted longer. Her last period was August 24, the previous one in July. She has been married fourteen years, has had no children but one pregnancy, with an abortion at two months, four years ago. On September 2, she commenced to have considerable pain in the back and on the right side low down; also a bloody discharge. The periods continued without relief. There is continuous aching pain in the lower part of the back and irregular sharp pains in the right side. The abdomen is very sensitive. Examination under anesthesia disclosed a multinodular myomatous uterus, the organ being about three times the usual size. Several hard nodules could be made out. On the left side was a nodule about 3 cm. in diameter. This differed somewhat from the surrounding ones. The myomatous nodules were uniform, firm in consistency, while the nodule on the left side, although hard in places, gave a sensation of softness. In other words, it gave one the sensation of a firm body with a rather yielding outer covering. I ventured to make a provisional diagnosis of tubal pregnancy, although at that time we had not read the history.

September 23.—On opening the abdomen a small amount of clear fluid was found in the peritoneal cavity. The uterus was multinodular, about three times the natural size. The

ovaries were adherent, the right tube was also somewhat ad-<sup>(154)</sup>herent. The left tube was swollen and adherent to the uterus. Near the uterus it was 2.5 cm. in diameter, purplish-red in color, and contained an unruptured tubal pregnancy. The uterus and the tubes were removed in the usual way from left to right. The ovaries were not disturbed. On opening the tube, Mr. Broedel found that the fetus was perfectly preserved and the membranes were still intact. The patient<sup>(155)</sup> made a very satisfactory recovery.

Our diagnosis was based on a definite and yet apparently undescribed sign, which I think we may designate as the "velvety feel." The examining finger detects a nodule which on gentle pressure seems to be rather soft and yet on firm pressure is found to be hard. The same sensation can be readily obtained by covering a piece of wood with velvet. This "velvety feel" is doubtless due to the soft muscular covering which encircles the pregnant sphere.

CASE IX.—*Pregnancy in one horn of a bicornate uterus, giving symptoms identical with those of tubal pregnancy.*

Mrs. R. C. F. consulted me on November 23, 1905. She has been married about three months. Her period of October 13 was two weeks late, the flow was very scant, dark, and lasted from ten to eleven days. Her period came on again on November 11, and has lasted on and off practically every day since then. For more than a month she has had pain in the lower abdomen, sometimes on the left side, at other times on the right. She has been nauseated, a symptom which she has never had previously. On pelvic examination the cervix was found to be normal, but slightly softened. The uterus was somewhat enlarged; there was no thickening on the right side. On the left there was a sensation of tenderness and in close proximity to the uterus was a mass about half as large again as the ovary.

The clinical history and the pelvic examination strongly suggested extra-uterine pregnancy. I accordingly made an ether examination the following morning. I was still able to detect the lump on the left side. After going into the ques-

tion thoroughly it was decided that an exploratory operation should be performed, although I could not positively exclude intra-uterine pregnancy. On opening the abdomen a 2½ months' pregnancy was found in the right uterus to which were attached the corresponding tube and ovary. The hard mass detected on the left side, apparently plastered up against

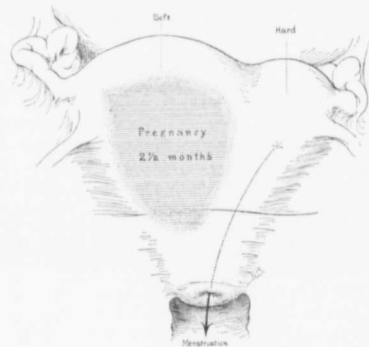


FIGURE 1.

the uterus, was the left non-pregnant horn. To the left of this the corresponding appendages were attached. Between the pregnant right horn and the non-pregnant left horn was a depression not more than 1 cm. in depth, a depression that might very readily have been overlooked; in fact when the patient was curetted some three years ago the uterus was apparently normal in size and no unevenness was noted. The abdomen was at once closed. The patient left the hospital in about 12 days. The condition here present is a most interesting one. If we for a moment consider the left uterine horn as a separate uterus, then gestation in the right uterine horn constitutes an extra-uterine pregnancy, consequently we should expect a "sympathic" development of decidua in the

left uterine horn. This would naturally for some time be (155)  
accompanied by a bloody discharge.

CASE X.—*Path. No. 9062.—Adenocarcinoma of the abdominal peritoneum complicating uterine myomata.*

Mrs. R., age 58. Seen in consultation with Dr. Wilmer Brinton, October 4, 1905. Twenty years ago Dr. Brinton saw this patient and found a fibroid about the size of an adult's head. He wisely advised against operation, as at that time the mortality was exceedingly high. He did not see her again until three months ago when she had a definite attack of peritonitis and since then has been forced to sit up all the time. She cannot lie down except with her knees drawn up. The cervix is intact. There is a good deal of offensive discharge. The abdomen is board-like, and is occupied by a tumor which fills the vaginal vault and extends almost to the umbilicus. Although the patient is very anemic her pulse is of good volume and an exploratory operation seems justifiable.

October 10.—On opening the abdomen we found the omentum greatly thickened and a firm cord running up to the diaphragm just to the left of the median line. Numerous nodules were found scattered throughout the abdomen, and there was a large pelvic tumor. There seemed to be little doubt that we were dealing with a malignant change in a myoma associated with metastases. We removed a small piece of tissue for examination. It was impossible to attempt to completely enucleate the growth.

On histological examination of one of the omental nodules we found that the greater part of adipose tissue had been replaced by fibrous tissue which was very vascular. Scattered throughout this were masses of cells, which showed a tendency toward glandular arrangement. These cells had fairly deeply staining nuclei, in other places isolated cells of the tumor are found lying in the stroma. These were very large, many were multi-nuclear and had deeply staining nuclei. It appeared to be a most rapidly growing form of carcinoma.

In this case we had evidently had a large myoma which had lain dormant for a good many years and then carcinoma,

(155) possibly of the body of the uterus, had suddenly developed and gone on to the formation of metastases. With our present perfection in technique early operation in the greater number of myoma cases is clearly indicated as has been so forcibly pointed out by Charles P. Noble, of Philadelphia.

A  
Series  
of  
Intestinal  
Anastomoses

By  
THOMAS S. CULLEN, M.B. (Tor.)

Associate Professor of Gynecology,  
Johns Hopkins University



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## A SERIES OF INTESTINAL ANASTOMOSES.

BY THOMAS S. CULLEN, M.B. (TORO).  
Associate Professor of Gynecology, Johns Hopkins University.

In going over my cases of the last few years I thought it might be advisable to describe in detail those in which it was necessary to remove portions of the bowel. The number is somewhat limited, but each case offers several points of interest:

Secondary carcinoma of the small bowel, 1 case.

Primary carcinoma of the cecum, 2 cases.

Tuberculosis of the cecum with perforation, 1 case.

Carcinoma of the sigmoid flexure, 1 case.

Carcinoma of the sigmoid flexure, complicated by a large uterine myoma, 1 case.

Carcinoma of the rectum secondary to a primary growth in the right Fallopian tube, 1 case.

Rectal diverticula, with perforation and abscess, 1 case.

### SECONDARY CARCINOMA OF THE SMALL BOWEL.

In the following case a loop of the small bowel had become adherent to a friable carcinoma of the ovary. The growth had invaded the intestinal wall and the slightest traction was sufficient to rupture it. The Connell interrupted suture was employed except for the last few sutures, where we used mattress sutures penetrating the peritoneal and muscular coats but not piercing the mucosa. To make doubly sure we reinforced with a running suture entirely around the bowel. As it was impossible to completely remove the carcinoma of the ovary, a large gangrenous area being left behind and requiring drainage, we found it necessary to push the loop containing the anastomoses far over to the left among healthy loops; otherwise it would certainly have been infected by the necrotic and gangrenous tissue. As noted in the history the bowel gave no further trouble.

*Tentative diagnosis: Subperitoneal and intraligamentary myomata. Actual condition: Hydrosalpinx, adeno-carcinoma of the right ovary, involvement of the small bowel and marked extension to the bladder. Hysterectomy, partial removal of the cancerous growth, resection of a portion of the small bowel; temporary recovery.\**

\*Extracted from the *Journal of the American Medical Association*, November 19, 1904.

*History.*—On Jan. 25, 1904, I saw the patient, who was 48 years of age. Her menstrual periods had continued regularly until she was 44. Since then the flow had appeared every three or four months, and there had been a slight vaginal discharge. Two years previously she had passed a calculus, apparently from the left kidney.

*Examination.*—On vaginal examination I found the uterus half as large again as normal. Projecting from the fundus on the right side, and very prominent, was what appeared to be a subperitoneal myoma about 5 cm. in diameter. The right side of the pelvis was filled by a growth which apparently sprang from the uterus and filled the broad ligament. This growth in contour and consistence resembled a myoma.

*Operation.*—On opening the abdomen (Feb. 2) I found the uterus moderately enlarged. The supposed subperitoneal myoma proved to be a very tense hydrosalpinx, which was kinked forward, thus accounting for its prominence. The growth on the right side was a carcinoma of the ovary. It filled the broad ligament and had infiltrated the bladder wall. Attached to the cancerous mass was the omentum with a loop of small gut. As the gut at this point was markedly constricted, I attempted by gentle dissection to release it, but the bowel was so infiltrated by cancer that it commenced to tear and resection of a portion was imperative. It was decided that the only hope of even temporary relief would be hysterectomy with as thorough removal of the growth as possible. This was done, but a raw, green, offensive, cancerous area, fully 6 cm. in diameter, remained attached to the surface of the bladder. Three inches of the bowel were then resected and the ends united by means of the Connell suture, supplemented by the Lambert suture. The anastomosed bowel was then placed among healthy loops of gut as far removed from the necrotic area as feasible. The pelvis was drained through the vagina and abdomen. The patient recovered promptly, but naturally still has a small abdominal sinus. We have employed a retention catheter continuously, as even its temporary removal was promptly followed by the signs of ascending renal infection. In November, 1904, the patient was in fairly good condition and had been entirely relieved of abdominal distension and cramps, to which she had been subject for some time prior to the operation.

In this case the clearly outlined subperitoneal nodule associated with the growth on the right side gave us a clinical picture very characteristic of multiple myomata, and this diagnosis was further strengthened by the healthy appearance of the patient. Some may doubt the wisdom of attempting any operative procedure in these cases, but in the liberation of the constricted and

friable intestinal loop the bowel was opened, and then the more radical procedure seemed to offer the best chance of temporarily relieving the patient. In this case an absolute diagnosis would have been impossible without opening the abdomen.

#### PRIMARY CARCINOMA OF THE CECUM.

We have operated upon two cases of this variety. One patient was 55 years of age, the other 56. In Gyn. No. 12197 the patient was greatly emaciated, had complained for months of strain ing in the lower abdomen and later had passed much blood. The tumor was easily palpable in the cecal region and operation was at first deemed out of the question. After a week's rest in the hospital, however, she had improved and at her earnest sollicita-



FIGURE 1.—SCHEME OF OPERATION IN GROWTHS OF THE CECUM.

1. Lateral anastomosis between the transverse colon and small bowel. 2. Section of ileum and closure of end. 3. Removal of the growth and closure of the end of the transverse colon. If the patient should suddenly collapse the operation may be abandoned at any one of these three steps.

tion the operation was undertaken. The subsequent months of comparative comfort were certainly well worth the ordeal of the operation, and up to the last she never had the unpleasant and racking symptoms that had been present before the operation.

In case No. 12016 the patient had lost some weight but was still in fairly good condition. She had never had any bloody stools and complained of very little discomfort. It is sometimes difficult to understand why in the one case there was so much hemorrhage while in the second, apparently equally far advanced, there was never any loss of blood. In the latter the character of the growth may afford the explanation. It was a colloid carcinoma. The greater part of the growth had been converted into colloid material. Near the surface few blood vessels were present.

Case 12197, on the other hand, was a typical instance of adenocarcinoma with small glands.

In one case we left a fistulous opening, in the other we closed without drainage. The latter method is, I think, the better procedure. In cases of carcinoma of the cecum it seems wiser to make the lateral anastomosis with Robson's or Moynihan's clamps first. If the patient be too weak, the subsequent steps of the operation can be omitted (Fig. 1). Is she be still in fair condition the growth is removed and the ends of the ileum and ascending colon can be closed.

*Adeno-carcinoma of the cecum; great emaciation; lateral anastomosis between the ileum and transverse colon; resection of the diseased bowel; temporary recovery.*

Gyn. No. 12197. Mrs. J. R., white, aged 56. Admitted to the Johns Hopkins Hospital, June 21, 1905. Discharged Aug. 2, 1905.

The patient's chief complaint is of weakness and exhaustion. She has never been strong. Six years ago she had general dropsy. Has been married 37 years. Has had five children, the youngest 25 years old. The menopause occurred five years ago. Two years ago the patient began to pass much mucus by the rectum and had a good deal of straining in the lower abdomen. She passed no blood. This condition persisted until four weeks ago when the movements became very dark and foul-smelling; there was never any bright blood in the stools. There has been rapid loss of weight and strength and a tender lump has recently been noticed in the right iliac fossa just above the crest. This has become increasingly tender and for the past week the exhaustion has been extreme. There have been no nausea, vomiting, or stomach symptoms of any kind. On examination I found the patient very much emaciated, of a sallow tint, the mucous membranes were pale and it was with great difficulty that she could walk. Just above the crest of the ilium on the right side, extending into the right iliac fossa, a firm, irregular and very tender mass can be felt. This is apparently situated in the cecum or in the abdominal wall directly over the cecum. Extending upward from this is a tumor mass. When the patient came to me I told her husband, who is a physician, that it was useless to perform any operation, but that we could send her to the hospital for a week's rest prior to her going away. During the week she gained considerably but then had an intestinal hemorrhage and lost ground. She again improved to some extent and wished to have something done. It was only after a great deal of persuasion that we decided to do an exploratory operation, not for a moment deeming that it would be feasible to remove the growth. On June 18, 1905,

she was very much improved in color and strength and her hemoglobin had increased to 60 per cent. The mass in the right iliac fossa was not nearly so tender as on admission.

*Operation, July 5.*—The tumor mass involving the cecum was found freely movable. No enlarged glands in the mesentery or in the omentum could be detected, nor was there evidence of peritoneal metastases. On account of the apparent limitation of the growth we decided to remove it. The mass was freed from the peritoneum of the lateral wall to which it was adherent. Not knowing just how long the patient could stand the operation we



FIGURE II.—CARCINOMA OF THE CECUM.

The greater part of the picture is occupied by the crater-like growth with undulating walls. Its line of advancement in the ascending colon is indicated by *a*. Its encroachment on the ileum by *a'*. The pericecal fat is infiltrated by discrete nodules as seen by *b, c*.

divided the procedure into three steps. First we made a lateral anastomosis between the lower end of the ileum and the transverse colon. Next the ileum was cut across at a safe distance from the growth and the end turned in and closed. The third step consisted in loosening up the growth, severing the ascending colon above the growth and closing the colon. In this way we could have hurriedly concluded at any one of the three steps. The abdomen was closed without drainage. In freeing the tumor we had to be exceedingly careful, as the ureter lay directly beneath the tumor. The right kidney had been prolapsed and the edge

of it also lay beneath the tumor. The kidney was in close contact with the tumor and helped to make the growth seem so large.

July 8.—The patient has done well since the operation; she has had no nausea nor vomiting since the first day. No distension. She is taking her nourishment well.

Several days after this she became exceedingly weak and it was thought that she could not recover, but she speedily regained ground and was discharged apparently well on Aug. 2.

Sept. 6.—The doctor wrote me: "I am glad to say that the patient has been home from the hospital five weeks to-day and has increased one pound a week in weight. Her appetite is good, in fact, better than for two years. Her complexion is fairer than for years. She is on her feet the greater part of the day. Takes breakfast in her room, but the other two meals she enjoys at the table with the family. Her bowels are all right. At times she has some abdominal soreness and swelling."

I saw the patient in November. Her general condition was good, but she had some soreness in the right side. On careful palpation we could still detect the sensitive and prolapsed right kidney, but there was no evidence of metastases at any point.

She grew a good deal weaker and died on Jan. 8, 1906, free from pain and perfectly conscious.

Path. No. 8823. The specimen consists of the cecum, of the surrounding fat and of the appendix. The entire mass is board-like in consistency. The appendix is practically normal in size and is glued down to the cecum and to the neighboring fat. The hollow cup of the cecum is surrounded by a dense wall varying from 1 to 3 cm. in thickness. The cavity presents a crater-like appearance and is 3 cm. in depth (Fig. 2). The tissue is dark and crumbly. The mucosa, where present, is dark in color. Projecting from the mucous membrane are large and small nodules of the growth. On one end of the section is normal mucosa belonging to the ascending colon, on the other a considerable flap of normal ileum.

*Histological Examination.*—The cavity is found to be lined by many glands which present a tree-like arrangement, the epithelium being one layer in thickness. This tissue shows a great deal of round-celled infiltration. The well-advanced parts of the growth are composed of quantities of glands closely packed together. These glands are small and in many places the epithelium has proliferated to such an extent that the gland cavity is completely filled. The cell nuclei are remarkable for their uniformity in size. The growth is a typical adenocarcinoma which has extended far beyond the contour of the wall of the bowel. The outlook, of course, is unfavorable.

*Adeno-carcinoma of the cecum with extensive involvement of the lymph glands; resection of the diseased bowel. Patient apparently well.*

Gyn. No. 12016. Mrs. F. H., admitted to the Johns Hopkins Hospital, April 2, 1905. Discharged, June 1. The patient is a widow 55 years of age, white. Her family and previous histories are not important. She has had two children. Her present trouble began about three years ago with an attack of diarrhoea, loss of weight, and general ill health. During the past two years she has had several attacks of colitis. Repeated examinations of the stools have been negative. Abdominal palpation from time to time did not reveal anything. She has lost about 30 pound in weight during the last year, but recently has gained some. She is quite anemic; red corpuscles 2,700,000, leucocytes 7,000, hemoglobin 40 per cent. She has had little or no pain but a general sense of soreness at short intervals. In the right iliac fossa Dr. Nathan R. Gorter noticed a slight thickening about three weeks ago. This has been growing since that time. Appetite poor, bowels regular, no bleeding from the bowel at any time. On careful palpation I was able to detect a distinct area of induration in the region of the cecum. This appeared to be 4 cm. in diameter, but was no index to the actual size of the growth.

April 3.—A long incision was made through the right rectus. A carcinoma was found involving the cecum and a small portion of the ileum and about half of the ascending colon. The bowel was freed and clamped above and below. A lateral anastomosis was then done by means of the Moynihan forceps. The free end of the ascending colon was closed, the end of the ileum brought out through the lower angle of the abdominal incision and the abdomen closed.

April 6.—The patient has been unable to retain any nourishment. The nausea continues. The bowels have moved, per rectum, several times. The free end of the ileum that was brought out through the lower angle of the wound is sloughing off to some extent. There is no escape of fecal matter through it.

Nausea and vomiting continued at intervals for a week and there was at times free fecal discharge from the enterostomy wound. The patient gradually improved, and several attempts were made to close the fistulous opening, but the bowel was so much indurated as a result of fecal matter coming over it, that the sutures did not hold. The patient made a very satisfactory recovery and was discharged from the hospital on June 1. There was, however, a slight fecal fistula.

Feb. 28, 1906.—The fistulous tract closed fully three months ago. The patient is in excellent condition and is able to go everywhere. She is in better health than for years. Of course,

the outlook is very unsatisfactory, considering the histological findings.

Gyn. Path. No. 8490.—The specimen consists of the cecum, appendix and a small part of the ileum, also of several mesenteric lymph glands. The growth itself is approximately 10 cm. in length, 9 cm. in breadth and about 8 cm. in thickness. The outer surface is nodular and at several points rather friable. It looks waxy or gelatinous and at first sight would make one think that

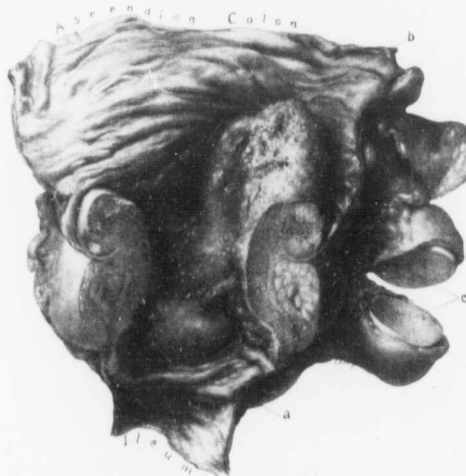


FIGURE III.—PRIMARY COLLOID CARCINOMA OF THE CECUM.

Gyn. Path. 8490. In the lower part of the section healthy ileum is seen. In the upper part unaltered mucosa of the ascending colon. The lower margin of the growth is indicated by *a*. The extension in the ascending colon by *b*. The growth is very thick and projects in places fully 1.5 cm. into the lumen of the bowel. It presents a translucent appearance and shows very little breaking down except in the vicinity of *b*. This accounts for the absence of hemorrhage. *c* is a very large mesenteric gland. It was fairly riddled with the adeno-carcinomatous growth.

it was somewhat edematous. The enlargement, on careful examination, is found to be due to infiltration of the fat, especially in the vicinity of the appendix, by the nodular growth which here and there is granular. The walls of the cecum vary from 5 mm. to 1.5 cm. in thickness. The tissue has a gelatinous appearance and is somewhat transparent. In some places the growth is dirty and necrotic-looking. The line of junction between the growth and the ascending colon is sharply defined, the growth projecting



about 8 mm. from the surface. The line of demarcation between the growth and the ileum is also sharply defined, but here the mucosa of the ileum is undermined. The largest lymph gland in the mesentery reaches 2.5 cm. in diameter.

On *histological examination* the mucosa at the edge of the growth is seen to be normal. As we approach the growth, however, it shows considerable small round-celled infiltration. It then ends abruptly and is replaced by the new growth, which also consists of glands. These glands, however, are large and small and not regular as we find in the normal mucosa. Their epithelium in many places has so proliferated that the gland lumen is obliterated. In other places large and small colonies of glands are seen. The nuclei of the gland epithelium are fairly uniform in size; some, however, are larger than usual and stain deeply. From the gland grouping one would not hesitate to make an immediate diagnosis of carcinoma. In other places the glands are exceedingly small and closely packed together. This is especially evident where the tissue is dense and surrounded by much small round-celled infiltration. At other points the glands are separated from the stroma by a colloid secretion, and in the outlying portions of the growth where the cancer has run wild this colloid material is so pronounced that the epithelium has almost entirely disappeared, apparently being converted into this colloid material. The growth has extended to the outer surface of the bowel and, as was noted at the operation, extended to the adjoining mesentery. Far out in the adipose tissue is a lymph nodule 4 mm. in diameter. Along its margin at two points are large areas of carcinomatous infiltration where the gland type is perfectly preserved. The large lymph gland has been given over almost entirely to the new growth and few if any lymphoid elements are to be detected except just along the margin of the nodule. The case is one of adeno-carcinoma of the cecum, in which the colloid-producing cells predominate.

#### TUBERCULOUS STRICTURE OF THE ASCENDING COLON.

The careful and exhaustive articles bearing on lesions of this character that have already appeared render it superfluous for me to enter into a detailed consideration of the subject. Those wishing to study the subject fully are referred to the interesting articles of Henri Hartmann and Pilliet,\* and Reclus,† in the French; of Hofmeister,‡ Adolf Hartmann,§ and Gross,|| in the German, and of Lartigau,\*\* in this country. Hofmeister has

\* Note sur une variété de typhlite tuberculeuse simulant les cancers de la région. Bull. de la Soc. anat. de Paris, 1891, t. lxxvi, p. 471.

† Typhlite et appendicite tuberculeuses, Clinique Chirurgicale de la Pitié, 1894, p. 317.

‡ Ueber multiple Darmstenosen, tuberkulösen Ursprungs. Beiträge zur klinischen Chirurgie, 1896, Bd. xvii, S. 577.

§ Ein Fall von tuberkulöser Darmstenose. Inaug. Diss., Tübingen, 1897.

|| Ueber stricturende Darmtuberkulose. Inaug. Diss., Tübingen, 1901.

\*\* Journal of Experimental Medicine, 1901, vol. vi., p. 23.

tabulated all the cases he could find in the literature, and his consideration of the subject is most thorough, while Baumgarten, through his students, Hartmann and Gross, has contributed not a little to the pathological aspect of this disease. The works of Lartigau and Hofmeister should be carefully read by all particularly interested in this class of cases.

Tuberculous ulceration of the intestine is relatively frequent, as evidenced by the findings at autopsy, but stricture of the lumen of the bowel following as a result of this condition is somewhat rare. Hofmeister says that Eisenhardt, in 1,000 autopsies on tuberculous patients, found intestinal lesions 566 times. In only 9, however, was there a more or less definite stricture of the bowel.

Tuberculous strictures of the bowel are usually single and situated at the ileocecal valve. The cecum is converted into a sausage-shaped mass, which is adherent, as a rule, posteriorly and occasionally laterally. The omentum, although at times adherent to the growth, is not as prone to engraft itself on the tumor as in cases in which appendicitis exists. The outer surface, while relatively smooth, may be studded by a few tubercles. At one point the gut shows a constriction, and usually around this the adipose tissue is very dense. Where the cecum is cut into, the mucosa frequently shows considerable alteration. It is sometimes studded with irregular or serpiginous tuberculous ulcers, while the intervening mucous membrane is the seat of a chronic inflammatory process. At the point of stricture the lumen of the gut is so narrow that the tip of the finger can hardly be introduced. In some cases so small is the calibre of the bowel that a sound is passed with difficulty, and in our case a small bird-shot was sufficient to completely occlude the canal. The degree of alteration in the *caecum vaies* with the individual case, and it is only necessary for the reader to picture the tuberculous process advancing until the cecum becomes matted and densely adherent to all the neighboring structures, and, in rare instances, the process gradually involves the abdominal wall until finally there is a fistulous opening on the surface. Even in the early stages the mesenteric glands are enlarged and already involved in the tuberculous process, and where the cecal invasion is apparently in its incipency there may be caseation of these glands.

Tuberculous stenoses of the gut, when multiple, are almost invariably situated in the ileum. Anywhere from one to twelve strictures have been noted in the same patient. In one case Hofmeister found twelve strictures scattered over a distance of about seven feet of gut. The bowel between the strictures is frequently distended, and in rare cases has been known to reach 17 cm. in circumference. Lartigau draws especial attention to a group of these cases in which, associated with the tuberculous process, there

is a marked diffuse thickening of the bowel wall, which occasionally reaches 1 cm. or more in thickness.

The appendix is usually adherent, but, except where the tuberculosis of the cecum is far advanced, shows no implication in the specific process. Our case proved no exception to the rule. Although bound down by adhesions, the appendix was otherwise normal.

*Histological Picture.*—In sections from the cecum the edges of the ulcers may show tuberculous tissue, but, as a rule, epithelioid cells or typical tubercles are wanting, and nothing but granulation tissue can be made out. In the vicinity of the muscle, however, groups of epithelioid cells, and now and then tubercles, are seen. The peritoneal surface is usually free from tuberculous nodules until the disease is far advanced or unless the cecal lesion has been associated with tuberculous peritonitis. Sections from the stricture are composed entirely of connective tissue; sometimes with, at other times without, areas even slightly suggestive of tuberculosis. The adipose tissue surrounding the gut at the point of stricture is much infiltrated with small round cells, rendering the fat exceedingly hard and firm. Sections from the lymph glands in the region of the cecum almost invariably yield typical tubercles.

Naturally the tuberculosis gradually extends to the muscle and outer coats of the bowel. The farther away the process extends from the lumen of the bowel, the more characteristic will be the specific lesions, since the inflammatory changes produced by the intestinal bacteria have less opportunity of masking the tubercles. The diffuse thickening or "chronic hyperplastic tuberculosis" of the intestine yields a picture very different from that of simple tuberculosis, as has been clearly pointed out by Henri Hartmann, Lartigau, and others. In these cases the tuberculous process has been relegated entirely to the background, while the mucosa and muscle have been overrun with round cells. Intestinal bacteria have doubtless gained entrance to the walls through the tuberculous lesions and have continually kept up a chronic inflammation of the bowel wall so widespread in character that the tuberculosis is entirely overshadowed. At a few points, however, it will still be demonstrable, and can be detected with certainty in the mesenteric lymph glands. Even in the cecal wall, when the typical lesions are totally wanting, tubercle bacilli can still be readily demonstrated.

*Clinical History.*—Patients presenting tuberculosis of the cecum are usually between twenty and thirty years of age. The condition, however, may be found in the very young, and has been noted in persons fairly advanced in years. Quite commonly the patient has suffered from an old tuberculous process in the lungs

or has a suspicious family history. In many of the cases which have come to autopsy healed lesions in the lungs have been demonstrated, while in a few instances there has been swelling of the cervical, axillary, or other lymph glands coincident with the cecal lesion. One of the first symptoms is constipation. After a time dull or sharp pain is felt in the appendiceal region. As the constriction develops there may be an intermittent diarrhea, with the gradual narrowing of the bowel, and fulness may be noted over the cecum. Where there is much infiltration of the intestinal wall the gut becomes very firm and feels like a sausage-shaped tumor. With the gradual growth of tuberculous tissue and narrowing of the bowel symptoms of obstruction manifest themselves, as evidenced by abdominal distension, colicky pain, marked peristalsis, vomiting, and rapid loss in weight.

But although these symptoms may be present, in some instances definite indications of the presence of the lesions may be entirely absent. In our case the patient felt well until the day before operation, complaining only of slight discomfort near the appendix.

*Diagnosis.*—With the increased attention paid to cecal tuberculosis the possibilities of overlooking these lesions will be lessened. It was only a few days after our case was operated upon that Dr. Finney saw a patient giving symptoms sufficiently suggestive of a tuberculous lesion in the cecum to render such a diagnosis justifiable. At operation the cecum was found to be the seat of a most extensive tuberculous ulceration. Fortunately, it was found possible to excise the whole of the diseased area.

Given a tumor in the right iliac fossa, of slow growth, a clinical history pointing to a previous pulmonary tuberculosis, and a comparative absence of temperature, it is highly probable that tuberculosis is present. If a patient be fairly well advanced in years, of course, the possibility of a malignant growth must be considered. As pointed out by Hartmann, Lartigau, and other authorities, tuberculosis of the cecum, especially of the hyperplastic form, has often been taken for sarcoma. This has been due to the massive infiltration with small round cells. But provided that we remember that they form a definite infiltration, instead of one or more large foci, and further, that the cells are uniform in size instead of being large and small and actively dividing, confusion is not likely to occur.

The gross diagnosis between tuberculosis and carcinoma of the cecum may offer numerous difficulties, but on microscopic examination no confusion can exist, as in the tuberculous process the epithelial elements play an entirely passive role or have disappeared. Moreover, the demonstration of the tubercle bacilli is generally easy.

The diagnosis between cecal tuberculosis and appendicitis is usually dependent on the tuberculous history and the slow growth of the tumor, together with the absence of a temperature suggestive of a pus accumulation. Of course, in a case similar to the present one, a differential diagnosis would be absolutely impossible.

*Treatment.*—If tuberculosis of the cecum be diagnosed early operation is indicated. Resection of the entire diseased area is, of course, necessary for an absolute cure. Lateral anastomosis between the ileum and ascending colon is the ideal operation. If after resection of the diseased portion of the gut very little mobility be obtainable, in order to avoid tension an end-to-end anastomosis is the only alternative. Where there are numerous strictures scattered over an area of several feet of gut, the question arises as to whether the entire diseased area should be excised or several anastomoses be made, removing only the diseased segments and leaving the intervening normal gut. If the span of gut involved by the tuberculous process be not over three or four feet, it is wiser to remove this portion in its entirety. In one of the cases reported six or seven feet were removed, and the patient recovered. With the diseased cecum it is always necessary to carefully examine the glands of the mesentery, and if they be involved, they too should be excised. The results from resection have been very gratifying, Hofmeister in his table of 83 operative cases showing a recovery of 62 per cent.

*Tuberculous stricture of the ascending colon, with sudden total obstruction of the bowel; perforation of the intestine; removal of the cecum and half the ascending colon. Recovery.\**

The following is taken from my case-book, November 29, 1902: At 11 p.m. I saw, in consultation with Dr. Charles F. Simon, Miss K. G., aged twenty-four years. The day before she had had indefinite pains in the region of the appendix. They were, however, not very severe and lasted but a short time. Today she did her work as usual and prepared supper, but shortly afterward was taken with severe pain in right side and was forced to go to bed. At 9 p.m. Dr. Simon saw her. There was marked rigidity of the right rectus over the appendiceal region. There was little temperature. On examination of the blood Dr. Simon noted that all eosinophiles had disappeared and that there was an evident leukocytosis.† When I saw her two hours later the rigidity of the right side had in part disappeared, probably as she was slightly under the influence of morphine. The general condi-

\* Extracted from the *American Journal of Medical Sciences*, March, 1901.

† Simon lays much stress on the frequent absence of eosinophiles where pus is accumulating and thinks that this sign is of more practical value than the degree of leukocytosis.

tion was good; pulse full and regular. Nevertheless, I advised immediate operation.

At 1.30 a.m. the abdomen was opened and a thin, watery pus immediately escaped from the peritoneal cavity, and the pelvis

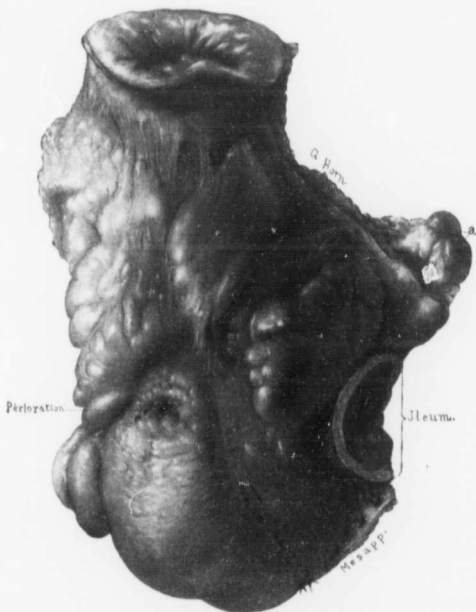


FIGURE IV.—TUBERCULOSIS OF THE CECUM WITH PERFORATION.

Above is a cross-section of the ascending colon. Below and to the right the ileum. At a point directly opposite the ileum is a perforation of the cecum, and just above the perforation the adipose tissue is thickened and there is a constriction of the gut. At *a* are two enlarged and tuberculous lymph glands. (For the interior view of the specimen, see Figures 5 and 6.)

was found to be completely filled with pus. The intestinal loops, however, on the whole, presented a fairly normal appearance. Here and there they were covered by a few flakes of fibrin. The appendix was easily recognized and was bound down by adhesions.

It was tied off from tip to base. As the distal extremity appeared to be normal, we expected to find a perforation near the cecum, but on complete removal of the appendix it was found that, apart from adhesions, no alteration was present. After removing the pus from the abdomen, a sponge was passed into the right renal pocket to see if any pus was there, and, to our surprise, some dark fluid escaped. This was entirely different from that found in the pelvis. The abdominal incision was continued upward to the ribs, and we immediately saw a perforation, about 4 mm. in diameter, in the ascending colon. As there was a good deal of fluid escaping, I temporarily closed this fistulous opening with a purse-string suture. I then drew the ascending colon out and made a longitudinal incision, and on introducing the finger into the colon found total obstruction a short distance above the ileocecal valve. The lower third of the ascending colon, the cecum, and a small portion of the ileum were tied off and removed, together with some enlarged glands in the mesocolon. The ascending colon and ileum were then united by end-to-end anastomosis. Lateral union would have been preferable, but we had no choice, as the tissues would have been on too great a tension. A Connell suture was employed for two-thirds the circumference of the gut, the remaining third being turned in with rectangular mattress sutures. The entire line of suture was reinforced by running mattress sutures. The pelvis was carefully sponged out, the intestinal loops were brought up into the abdomen, and the entire pelvis was loosely packed with iodoform gauze.\*

A gauze drain was left at the site of the anastomosis. The patient stood the operation well. Her pulse did not rise above 100. The outlook, however, was not particularly flattering, considering the fact that there was a commencing peritonitis and also considerable edema of the intestinal wall. Eight days after operation, on removal of the last of the gauze, some fecal matter was found on the dressing. The fistula gradually closed, and the patient made an excellent recovery.

February 12, 1904.—The patient has been at work for several months, performing general household duties without the slightest inconvenience. Her general condition is excellent. From her I learned that she had had typhoid (?) fever six years previously and was in bed for two weeks. For the last year she has had cramp-like pains throughout the abdomen two or three times a month, and recently the bowels have been more constipated than usual.

\* For several years, where the pelvis has been filled with free pus, I have made it a practice, after having wiped the pelvis and intestines off, to place the patient for a moment in the Trendelenburg posture. The pelvis has then been loosely but fully packed with gauze, the ends of which are brought out through the appendix incision. My object has been to prevent the intestinal loops from dropping down and becoming adherent or kinked in the pelvis. In my hands this procedure has yielded very gratifying results. The loops, although still liable to become adherent, are on a level and are not nearly so prone to become obstructed.

She gives no history whatever of injury or bruising of the abdomen. For about a week before her admission to the hospital she had had intermittent abdominal pain. From the family history we were unable to get any data suggestive of hereditary tuberculosis.

March 1, 1906. The patient is now in excellent health.  
*Pathological Report.*—Gynecological-Pathological No. 6316.)

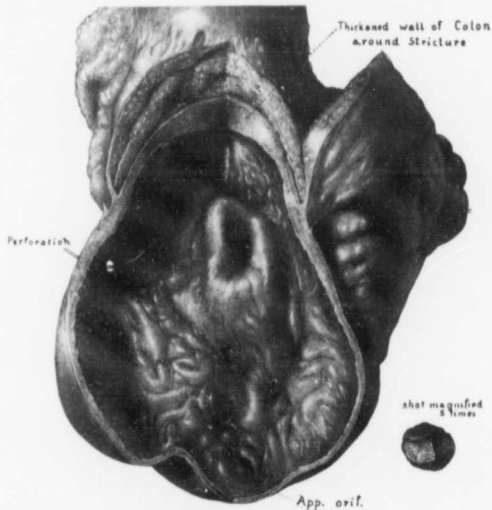


FIGURE JV.—COMPLETE OBSTRUCTION OF THE ASCENDING COLON WITH PERFORATION ON THE PROXIMAL SIDE OF THE STRICTURE. (k)

The walls of the colon are greatly thickened and the narrowed lumen is completely obstructed by a small bird-shot. Opposite the ileo-cecal valve is the small perforation and at the lower end of the picture the inverted appendix stump is seen.

The specimen consists of a small portion of the ileum, of the cecum, and of about one-half of the ascending colon. The mucosa of the ileum is unaltered, that of the cecum in most places is normal, but at a point directly opposite the ileocecal valve is a perforation 5 mm. in diameter (Fig. 4). The walls of the perforation are rather smooth and the surrounding mucosa, over an area 1 cm. in diameter, is somewhat thickened. The ascending colon,



about 5 cm. above the perforation, shows a marked constriction. At this point the lumen narrows down until it is not more than 2 mm. in diameter. Indeed, so small is it that a fine bird-shot would lodge and completely plug the canal at this point (Figs. 5 and 6). The intestinal wall at the point of constriction varies from 5 mm. to 8 mm. in thickness and is exceedingly firm in consistence. The constriction is 1 cm. in length and the ascending colon above this point is unaltered.

*Histological Examination.*—The appendix, beyond showing a few adhesions on its outer surface, is normal. The cecum in the vicinity of the perforation has entirely lost its glandular elements, the specimen consisting almost entirely of granulation tissue. The underlying muscle shows a varying amount of small round-celled infiltration. This is especially abundant in the vicinity of the peritoneal covering.

Along the margin of the perforation there is also much granulation tissue, and the underlying muscle is everywhere infiltrated by small round cells. The ulceration is evidently an old process, as nowhere is a very acute inflammatory reaction present. The walls of the stricture are, to a great extent, composed of fibrous tissue. Here and there we have some light areas somewhat suggestive of tuberculosis. No giant cells are, however, demonstrable. Several mesenteric glands were removed with the intestine. Some of these reached 1.5 cm. in diameter. On histological examination they show typical tubercles, some sections of which contain four or five giant cells. The tuberculous process in the lymph glands has here and there advanced to caseation.

The following points merit attention in this case:

1. The total absence of definite symptoms until a few hours before operation.
2. The presence of symptoms identical with those of acute appendicitis.
3. Marked contraction of the stricture.
4. The advisability of always exploring the right renal pocket in all cases in which there is free purulent fluid in the pelvis.

As seen from the history, the patient had practically no symptoms until about five hours before operation, and then there was moderate pain over the appendix, accompanied by rigidity of the right rectus.

Examination of the blood showed a total absence of eosinophiles. The only way in which we can account for the lack of symptoms is that for some reason there occurred an acute contraction of the stricture, which, up to that time, had permitted the free passage of feces. The possible existence of such a condition supplies another indication for early operation whenever trouble

exists in the appendiceal region. Already peritonitis had developed, although the symptoms had existed for so short a time; and had we delayed until morning there would have been little chance of saving the patient.

After having removed the appendix and wiped the pus from the pelvis, the abdominal cavity appeared normal, and I probably should not have explored the right renal pocket had I not been familiar with the renal work of Max Broedel, who has shown clearly that where there is a free accumulation of fluid in the



FIGURE VI.—TUBERCULOUS STRICTURE OF THE ASCENDING COLON WITH PERFORATION OF THE CECUM.

Directly opposite the ileocecal valve is a small perforation with slightly ragged edges. A short distance above this point the intestinal walls grow thicker and then form an annular constriction. The lumen of the ascending colon at the stricture has been so narrowed that a small bird-shot, when introduced, lodged therein and completely plugged the gut.

region of the appendix, by gravity it will travel down into the right renal fossa.

I should have preferred a lateral anastomosis, but we were forced to make an end-to-end union on account of tension.

#### CARCINOMA OF THE SIGMOID FLEXURE.

We have had one uncomplicated carcinoma of the sigmoid flexure. The patient was 53 years of age and, when I saw him, was very weak. He had lost much in weight and toward the last had had copious hemorrhages several times a

week. We had no alternative but to make an end-to-end anastomosis. As noted in the history he succumbed on the tenth day, but there was no evidence of peritonitis. He was too weak to stand the strain and developed cardiac depression similar to the attack of a year previous, at which time his life had been despaired of.

Our second case of carcinoma of the sigmoid flexure was accidentally discovered during a hysterectomy for a large myomatous uterus which was firmly wedged in the pelvis. The intestinal obstruction was thought to be caused by the myoma. There had been no symptoms on which one could definitely base a diagnosis of carcinoma. In this case the patient returned after several weeks and died from peritonitis in the right upper abdominal quadrant, a point far removed from the site of the anastomosis. The autopsy also clearly demonstrated that metastases were freely scattered throughout the abdomen, and further that we had not entirely removed the original growth. A more extensive operation would not, however, have been feasible.

*Adeno-carcinoma of the sigmoid flexure; resection of the diseased area, end-to-end anastomosis; death on the tenth day.*

Dr. A. G. W. This patient has been failing for nearly two years. First he noticed that he was losing in weight, but was able to go around and do his work fairly well. He was very easily fatigued; could not do as much night work as before; had been under treatment for some time with apparently no relief. When I saw him there had been rectal hemorrhages for over a year. On careful palpation we were unable to detect any growth in the abdomen, and on using a short proctoscope could make out nothing. As he continued to lose greatly in strength we sent him to the mountains, deeming that he could not stand an operation. He improved slightly, but soon again lost ground as a result of the frequent hemorrhages. Finally he was admitted to the hospital, and we decided to make an exploratory operation, remembering, however, that his heart a year previous had given rise to such alarming symptoms that it was thought he would succumb. After entrance the patient improved slightly, but the hemorrhages continued.

Sept. 22, 1904.—We made a median incision and examined the appendix. This we found twice its natural size and partly filled with fecal matter. It was removed. We then carefully examined the intestines and found hard masses throughout the transverse colon. These proved to be fecal concretions. In the pelvis was a hard mass which on pressure proved to be a malignant growth involving the bowel just below the brim. No glandular enlargement could be detected, but here and there fine

white lines—evidently dilated lymphatics—were seen passing down the meso-sigmoid. We carefully walled off the abdominal cavity and also the abdominal incision, clamped above and below the growth, and after removing the growth did an end-to-end anastomosis with a Connell suture for three-fourths the circumference of the bowel. The remaining portion was closed in with mattress sutures. Posteriorly the lower portion of the sigmoid on the right was rather thin and there was just the faintest possibility that there might be a subsequent leakage. Everything, however, looked perfectly solid. On account of the fecal concretions, we brought up a loop of the descending colon into the left inguinal region. This loop was opened the same night.

Sept. 29.—The patient since operation has had a practically normal temperature, but on one or two occasions it ran up to 100° F. His pulse has been fairly good. During the entire time there has been a good deal of nausea, but no vomiting. He has had an ice bag over his stomach, which has been exceedingly sensitive. At no time has there been any distension. The bowels moved thoroughly after calomel and magnesia. This morning at 12.30 he woke up in a profuse perspiration. His pulse was almost imperceptible, although an hour before he had been in excellent condition. I examined him between two and three o'clock. The pulse was not demonstrable either in the facial or in the radial region. He was given strychnin and digitalis. He soon lost consciousness, was very restless, and died at 4 a.m. We had here a definite cardiac syncope. He retained his nourishment from the beginning. It may be noted that a year ago he had a similar attack, and on that occasion his heart's action became so weak that he was not expected to rally.

Gyn.-Path. No. 7786. The specimen consists of six inches of sigmoid flexure (Fig. 7). Outer surface of bowel looks fairly normal except for a slight bulging. On palpation it is found to be very firm and gristle-like. On examination two distinct and separate growths can be detected. One is 4 cm. in diameter, the other 5 cm. Each one has raised edges and is sharply circumscribed. The growth extends on an average about 5 mm. from the surface, but in some places projects at least a centimetre into the cavity. While the edges are markedly raised the central portions present depressions. The growths are rather porous in appearance. The surrounding mucosa looks perfectly normal. Sections through the growths show that they are typical adenocarcinomata. All resemblance to the bowel mucosa has, however, entirely disappeared. The growths show irregular invasion of the submucosa and of the muscular layer of the bowel. There is considerable small round-celled infiltration.

*Diagnosis.*—Adeno-carcinoma of the sigmoid flexure.

*Acute intestinal obstruction; large myoma wedged in the pelvis; non-suspected adeno-carcinoma of the sigmoid flexure; hysterectomy; resection of the diseased bowel; end-to-end anastomosis. Temporary recovery.*



FIGURE VII.—CARCINOMA OF THE SIGMOID FLEXURE.

Path. No. 7786. The specimen shows two distinct foci of carcinoma. *a* and *b* each has depression in the centre with wavy elevated margins sharply circumscribed from the surrounding healthy bowel. They are separated from one another by an interval of at least 1 cm. of healthy mucosa.

Gyn. No. 12000. E. S., colored, aged 40. Admitted to the Johns Hopkins Hospital, March 26, 1905; discharged, June 9. I saw this patient in consultation with Dr. Clement A. Penrose. On admission she was suffering from intestinal obstruction. This

was thought to be caused by a myoma which had been known to exist for fifteen years. The family and previous history was negative. The menses began at 16, were always regular, and caused a great deal of pain; the flow was excessive. Twelve years ago she had a severe attack of abdominal pain. This was sharp and shooting in character, but there was no intestinal obstruction. For the past six weeks, beginning at the time of a menstrual period, she again noticed sharp, shooting pains in the abdomen. These were intermittent and practically limited to the left side. The bowels have not moved for several days, and the pains have been spasmodic, occurring at intervals of four to five minutes. She does not think that she has had any fever. There had been no blood in the stools before the obstruction. On the morning of her admission she vomited a small amount. On admission the lower abdomen was found distended by a mass. The tumor reached as high as the umbilicus on the left side, presenting a large nodule which pressed down in the left iliac fossa. A similar and smaller nodule was present in the right iliac fossa. Around the umbilicus peristaltic movements were marked, and were accompanied by loud gurgling in the intestines. Tympany was marked everywhere except just over the nodules and above the symphysis. The abdomen was opened at once. A myomatous uterus was found reaching as high as the umbilicus. Springing from the region of the right cornu was a pedunculated tumor about 10 cm. in diameter. There were no adhesions above and the appendages appeared to be normal. As the tumor was free above, but could not be easily lifted, we suspected an intra-ligamentary growth or inflammatory adhesions in the pelvis. The round ligaments on both sides were tied and the ovarian vessels controlled. The enucleation was begun from left to right. The uterus was amputated through the cervix, but its removal was accomplished with a great deal of difficulty owing to the broad cervical attachment.

After removal of the uterus the rectum was found to contain a growth which seemed to be malignant in character and was adherent to the cervix posteriorly (Fig. 8). The rectal tumor was loosened as carefully as possible from the cervix; it lay entirely below the brim of the pelvis. There was a nodule apparently about 7 cm. in diameter and the intestines for a length of 8 cm. were involved. The general peritoneal cavity was again carefully walled off and the bowel clamped above and below the diseased area. After removal of the growth an end-to-end anastomosis was done. Three-fourths of the bowel was closed by Connell sutures, the remaining one-fourth by mattress sutures. The entire suture line was reinforced by continuous sutures. The

posterior vaginal fornix was punctured and the pelvis packed with one strip of iodoform gauze. The anastomosis was very satisfactory and the condition of the bowel good. The growth was very low down, thus rendering anastomosis difficult. It was, however, too high up to permit removal through the anus. In order to give the anastomosis a complete rest a left inguinal colostomy was done, the descending colon being sutured to the peritoneum and opened later on in the evening. As we found it very difficult to get a good exposure for the anastomosis we incised the



FIGURE VIII.—BROAD-BASED MYOMATOUS UTERUS FILLING THE PELVIS—CARCINOMA OF THE SIGMOID FLEXURE.

The multi-nodular uterus is very broad-based, rendering the hysterectomy difficult. *a* indicates the uterine cavity. The myoma *b* contained many cancerous areas. Occupying the sigmoid flexure is the carcinoma *c*. This almost completely occluded the bowel. Its upper limits are indicated by *d*, its lower by *e*.

abdominal wall transversely, making an incision three inches long extending through the left rectus. We were thus enabled to greatly facilitate the operation and save much time. The liver and the omentum were free from nodules. The patient was returned to the ward in a very weak state, but in fairly good condition considering the severity of the operation. Her tempera-

ture at that time was 101.5° F. For several days after operation the patient was very restless and it was difficult to keep her quiet. She was continually trying to remove the binder. She gradually improved, however, and on May 13th an attempt was made to close the fecal fistula. In this, however, we were not successful, as when she left the hospital, on June 9, there was still a slight fecal discharge from the fistulous tract. She seemed to be in very good condition. The bowels moved well; there was little pain, but some tenderness over the region of the anastomosis. She was gaining in weight and strength.

Gyn.-Path. No. 8447. E. S. The specimen consists of a large myomatous uterus, of both tubes and ovaries and of a portion of the sigmoid flexure. The myomatous uterus has been amputated through the cervix. It is 16 cm. in length, 12 cm. in breadth and 11 cm. in its antero-posterior diameter. Attached to the surface are several interstitial and one pedunculated myomata. The pedunculated nodule is rough, oblong in shape, 7 cm. in its longest diameter. The undercut surface is 10 cm. in diameter (which would account for the difficulty encountered in the enucleation). On section many myomata are seen scattered throughout the walls.

Our chief interest is centred in the section of the sigmoid flexure. This is 9 cm. in length. The outer covering of the bowel looks fairly normal except for some slight whitish elevations. Occupying the entire thickness of the bowel near the centre is a hard, light-colored growth (Fig. 8). This is 4 cm. in length and extends throughout the entire thickness of the bowel. The growth itself with the indurated adipose tissue surrounding it is fully 3 cm. in thickness.

*Histological examination* shows in some places perfectly normal mucosa surrounded on either side by colonies of small glands. In some of these colonies the epithelium is so proliferated that the gland arrangement is lost. The epithelial cells of the new growth are much smaller than those of the normal epithelium. They stain more deeply and some of them are rather large. On the whole, however, they are of uniform size. The muscular coat is involved and here the nests of cells are much denser. They are, however, in many places surrounded by fibrillated tissue that takes the hemotoxylin stain and resembles mucin. The growth has extended to the outer surface of the bowel, but the chief thickening here is due to new connective-tissue formation in the fat.

The picture is one of typical adeno-carcinoma of the rectum. Gyn. No. 12204. The patient was again admitted on June 24, 1905. At the seat of the former colostomy was a small sinus



just admitting a probe. There had been no fecal discharge from this for several days. Until a week previously she had been in good condition. The bowels became constipated, there were frequent attacks of pain in the abdomen and during the last seven days there had been no movement. For the last two or three days the pains had increased in severity, but there had been no vomiting. Her temperature and pulse were normal. The abdomen was slightly distended. No peristaltic movements were visible. Enemata were ineffectual.

On June 25 the bowels moved spontaneously. On June 27 considerable vomiting occurred and distension was noted; there was great tenderness on palpation in the right upper quadrant. On June 28 enemata were given and there was some fecal discharge through the wound. The distension, however, continued and the vomiting persisted. On July 3 patient was taken to the operating room, as the condition had become alarming. No operation, however, was performed. She died the same day.

Autopsy No. 2558. Autopsy July 4, 1905, by Dr. W. Francis. Anatomical diagnosis. Old abdominal operation wound, hysterectomy and resection of the sigmoid for carcinoma, anastomosis of the colon, recurrence of carcinoma in anastomosis with stricture of the lumen, metastases in the peritoneum, small fecal fistula in the left inguinal region communicating with the descending colon. Fibrino-purulent peritonitis, source not determined. Atelectasis in the lower lobes of both lungs.

There is a small opening in the left inguinal region. The abdomen is slightly distended and on opening it a quantity of foul gas escapes. In the right upper quadrant in the region of the liver and extending over to the left upper quadrant is a little fibrino-purulent peritonitis. Large masses of fibrin cover the intestinal walls, surface of the liver, etc. This is walled off above the umbilicus by recent adhesions. Elsewhere about the abdomen there are adhesions which for the most part can be broken down. At the seat of the operation wound the structures are closely adherent to the abdominal wall. The intestines are everywhere bound down by adhesions which are of three varieties, fibrous, fibrous, and nodular. In other places throughout the small intestines adherent coils are found to be strongly bound together, but there are also localized small areas of adhesions consisting of round, hard nodules varying in size from a pea to a walnut and on examination consisting of dense, hard, more or less fibrous tissue studded with yellowish, opaque points. These new growths in many places project into the lumen, but in no way seem to have destroyed the mucosa. The nodules of new growth in the peritoneum are few in number, but each is apparently of con-

siderable size. Except for these points the peritoneum seems to be free from new growth. The lower nine inches of the colon were removed three months previous to the autopsy and an end-to-end anastomosis was made between the colon and the rectum. This line of junction runs behind the stump of the cervix uteri. The lumen of the bowel at this point is greatly contracted, admitting only the tip of the little finger. On section through this line of junction, it is found to consist of dense fibrous tissue with very fine, yellowish, opaque points through it. The mucosa of the rectum is injected. The source of the peritonitis in the right upper quadrant is not determined. The appendix is perfectly normal. The vagina and the stump of the cervix appear normal, but the scar tissue around the cervix and along the line of the peritoneum is suggestive of a new growth. There is a large amount of carcinomatous-looking tissue between the cervix and the rectum.

On histological examination sections from the region of the anastomosis show normal mucosa and a thickened muscular coat. There is a thick mass of fibrous tissue with carcinomatous alveoli scattered throughout it. These show the type of the original tumor. The growth is a typical adeno-carcinoma. Sections from the large fibrous nodules in the peritoneum which bound the intestines together at several points show that they also consist of fibrous tissue with abundant areas of adeno-carcinoma scattered throughout them.

The mesentery consists chiefly of fat. It also shows alveoli. Sections from the scar tissue in the region of the intestinal anastomoses also contain masses of cancer cells. The original growth was evidently not entirely removed, and there had also been metastases before the operation was undertaken.

#### CARCINOMA OF THE RECTUM, SECONDARY TO A PRIMARY GROWTH IN THE RIGHT FALLOPIAN TUBE.

This case is of interest on account of the extent of the operation. Complete removal of the uterus by Wertheim's method is usually sufficiently severe to tax the patient's strength without any attempt to remove a large segment of the bowel. In this case the rectum was fortunately very lax, and after freeing it without in any way disturbing the blood supply, we were able to do an exaggerated Whitehead operation, bringing down and cutting off the necessary amount of bowel, while still preserving the sphincter. Although in the end a hopeless case the patient was absolutely relieved of the distressing bowel symptoms, and to the day of her death, months later, never suffered from the slightest intestinal obstruction.

*Primary carcinoma of the right Fallopian tube (Fig. 9) with secondary involvement of the uterus, both ovaries, pelvic peritoneum, omentum, and rectum. Removal of omentum, uterus and appendages, one-third of the pelvic peritoneum, and six inches of the bowel. The patient was comfortable and considered herself well, five months after operation. The respite was, of course, only temporary.\**

Mrs. Z. was seen in consultation with Dr. J. Milton Lintieum, Jan. 5, 1905. The patient was 55 years of age. She was sparely built, fairly well nourished, but slightly anemic. For months she had had some hemorrhage from the uterus and later great pain on defecation; in fact, her discomfort had been so great that she said she could not endure it much longer. On examination, under anesthesia, I found the uterus slightly enlarged and on the right side a firm mass about 6 cm. in diameter. I thought it to be a myoma.

Jan. 7.—On opening the abdomen I found the omentum everywhere studded with nodules, some of them being very small, others 1 cm. or more in diameter, and umbilicated. I questioned the advisability of operating, but Dr. Lintieum thought it wiser to operate, as the patient said "she would rather die than go through the torture that she had been experiencing for several weeks." The omentum was separated close to the transverse colon, as in the vicinity of the colon no metastases were to be found. The right tube was much enlarged and apparently involved in a malignant growth. It was attached to the pelvic floor and the peritoneum at this point, over an area fully 5 by 6 cm., was involved in the process. On the right side the ureter ran directly beneath the thickened peritoneum. On the left side the ovary, although small, was glued down to the pelvic floor directly over the ureter. Posteriorly the uterus was firmly attached to the rectum. It was found necessary to carefully dissect out the ureters first, as it was evident that much of the pelvic peritoneum must be removed. The hysterectomy was carried out practically along the lines laid down by Wertheim's operation. Fully one-third of the pelvic peritoneum, however, was removed. I had hoped to remove part of the rectum with the uterus in one piece, but found that it was impossible. Consequently it was necessary to separate the uterus from the rectal growth. The rectum was freed on all sides, care being taken, however, not to interfere with the blood supply. The patient was then placed in the perineal position and the skin separated from the rectal mucosa, just as is done in a Whitehead operation. Six inches of the rectum were drawn down through the sphincter and cut off and the upper edge

\* From the *Johas Hopkins Hospital Bulletin*, Vol. XVI, No. 177, December, 1905.

of the rectum was sutured to the skin. The ureters were covered over as far as possible with the remaining peritoneum. A medium-sized gauze drain was introduced into the pelvis and brought out through the vagina. The entire operation took a little more than three hours. The patient had a very feeble pulse when she left the table, which was not surprising, as she was in a weak condition at the commencement of the operation.

Jan. 8.—The patient is improving greatly. Her pulse is 126, temperature normal, respirations about 30. This evening there has been considerable vomiting. Sixteen ounces of water were ordered with the hope of washing the stomach out. She vomited four ounces, fortunately retaining the twelve. There have only been about 70 c.c. of urine in twenty-four hours, but the general condition does not seem to indicate any uremia.

Feb. 1.—The patient has steadily improved since operation. There has been a great deal of discharge from the pelvis, but that is rapidly diminishing. She occasionally has a temperature of 101° F. The sphincter action at first was rather tardy, but is now much better.

March 1.—The patient is up and around and suffering little or no discomfort. Of course, a complete recovery is out of the question. The operation was performed merely to relieve her intense suffering.

*Subsequent History.*—During the spring and part of the summer she was free from pain, journeyed to distant points, and looked very well. About the middle of August she became rather weak; after seven days' rest in bed she suddenly grew worse and died in half an hour. From the symptoms it is possible that death was due to embolism. The operation relieved her of great suffering and gave her over six months of comparative comfort.

Gyn.-Path. No. 8114. The specimen comprises the uterus and enlarged right tube, both ovaries, the small left tube, and a cuff of pelvic peritoneum, the greater part of the omentum, and several inches of the rectum.

The uterus has been removed entirely. It is 7 by 5 by 3.5 cm. and is covered with numerous adhesions. The uterine cavity is of the normal size. The mucosa is thinner than usual and shows nothing of interest.

The right tube at the uterus is 3 mm. in diameter. After passing outward 1.5 cm. it suddenly increases in size, reaching a diameter of 1.8 cm. It gradually increases until near the fimbriated extremity it is 4 cm. in diameter. The entire length of the tube is approximately 12 cm. It is for the most part smooth, but at two points on its inner aspect the muscular coats

have given way and we have hernial spaces .8 by 1.8 cm. in diameter covered only by peritoneum (Fig. 9). The under surface of the extremity of the tube is roughened where it has been attached to the peritoneum of the pelvic floor. The tube was not opened until hardened. Sections near the uterus show that the lumen is fully 1 cm. in diameter, and that it is filled with a friable, porous, granular-looking growth which is free on the under side, but intimately blends with the upper or convex side

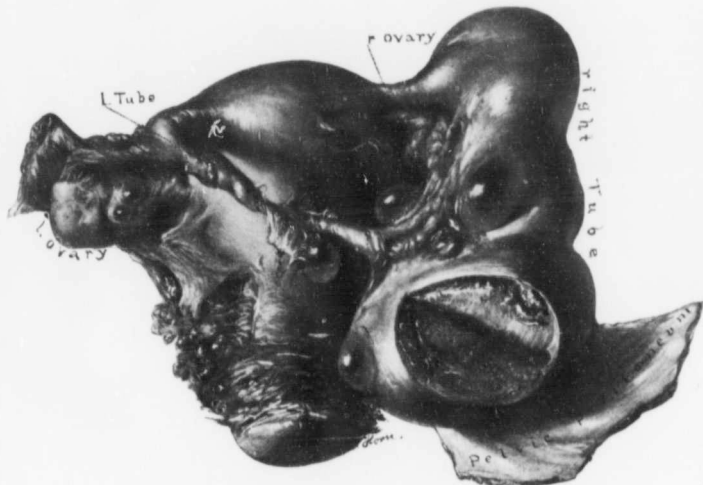


FIGURE IX.—PRIMARY CARCINOMA OF THE RIGHT TUBE.

of the tube. Sections near the outer end of the tube show that the walls are not over 1 mm. in thickness. Here also the tube lumen is filled with a similar friable growth which is whitish yellow or mottled, evidently as a result of old hemorrhages. The tube itself is nearly as large as the uterus.

The left tube is about 5 cm. in length, is slightly beaded, and varies from 3 to 5 mm. in diameter. The fimbriated end is patent and the tube has grown fast to the lower and outer end of the right tube. The right ovary is very small, is approximately

1.5 by 1 by 1 cm. The left ovary is also atrophic, being 2 by 1.5 by .6 cm. Attached to the right side of the cervix is an irregular area of peritoneum which was approximately 7 by 6 cm. The central portion of this is hard and indurated, the outlying portions are smooth.

The rectum is atrophied to a considerable extent. The length of the portion removed, in its fresh state, is about six inches. The rectal mucosa is smooth and apparently normal. The constriction was due to infiltration of the adipose tissue surrounding the rectum. The nodules in the omentum, as noted in the clinical description, are firm. Some of them measure fully 3 cm. in length.

*Histological Examination.*—Sections from the uterus show that the surface epithelium is intact. The glands are normal. At numerous points the muscle is becoming active and growing up into the stroma of the mucosa. It shows us fairly well how an adeno-myoma may develop from an in-growth of the muscle fibres.

Sections from the tube near the uterus show that springing from the upper wall of the tube is a new growth, as indicated in the gross description. The lower part of the tube is free. Projecting from the side of the tube where the lumen is free are little finger-like outgrowths covered by a single layer of delicate epithelium. The nuclei are oval and vesicular. Some of the nuclei stain very deeply and are rather increased in size. They immediately remind one of a malignant growth. Springing from the wall of the tube and filling almost the entire cavity is a papillary growth. The stroma of the out-growth consists of spindle-shaped connective tissue cells. The epithelial covering is one or many layers in thickness. In numerous places the epithelial covering has greatly proliferated, and we have solid masses of cells many layers thick. Here also there are large and deeply staining nuclei. In the deeper portion of the growth the connective tissue predominates and we have solid nests of cells. The epithelium tends to retract from the connective tissue. At numerous points large areas of the growth have undergone coagulation necrosis and we have fragmentation of the nuclei. The outer muscular wall in most places is still preserved. At some points, however, the entire thickness of the tube has been involved by the growth. Sections from the outer portion of the tube yield practically the same picture. The papillary arrangement is particularly well marked and many of the nuclei are spindle-shaped or irregular, very large and deeply staining. In some sections fully three-fourths of the field have undergone coagulation necrosis. In such areas only a few of the cells around the larger blood vessels still

retain their vitality. Scattered throughout the muscular walls of the tube are definite masses of growth chiefly in the form of cell nests or penetrating glands and on the outer surface of the tube are little bunches of new growths. We have undoubtedly a primary carcinoma of the Fallopian tube with a penetration of the entire tubal wall at numerous points.

Sections from the right ovary, which was very small, show that the organ in some places is normal, but at many points it has been penetrated by masses of carcinoma which send out branches in all directions. The cells present exactly the same characteristics and are manifest in the depth as well as on the surface. Here also there is some breaking down. The left tube near the uterus is practically normal. The left ovary, although also very small, shows diffuse infiltration by the growth. The structure is recognized as that of typical, carcinomatous glands or as isolated, large, irregular cells with irregular and deeply staining nuclei; in fact the ovary is riddled by the growth.

Sections from the omentum show a most typical picture. In such areas the fat of the omentum is to a great extent replaced by young and old connective tissue, and lying in the connective tissue are masses of epithelial cells, very solid, with a definite glandular-like arrangement. The same large, deeply staining and irregular nuclei are also here in evidence. The nuclear figures are particularly well formed. We find considerable hemorrhage and also breaking down of the carcinomatous elements. The only extension to the rectum is by continuity from the outer surface. The rectal mucosa has not been involved.

*Diagnosis.*—Primary carcinoma of the right Fallopian tube with extension to the peritoneum of the pelvic floor, to both ovaries, and also to the rectum by continuity, general pelvic adhesions; extensive metastases into the omentum.

For a further discussion of the various forms of cancer of the tube, we would refer the reader to Dr. Elizabeth Hurdon's article, published in the *Johns Hopkins Hospital Bulletin*, Vol. XII., p. 315, 1901, and to the recent article by G. J. Tomson, published in *La Gynécologie* in February, 1905.

#### RECTAL DIVERTICULA.

Rectal diverticula are not common. They are usually encountered at autopsy, but rarely detected during life. Had it not been for the perforation of two of these with subsequent development of an abscess between the indurated bowel and the uterus, the surgeon's aid would hardly have been required. As noted in the pathological report the greater part of the tumor is made up of indurated fat surrounding the diverticula. Had no micro-

scopic examination been made this would have been classed as a brilliant and permanent recovery after removal of carcinoma of the rectum.

Operations on the sigmoid or lower rectum are much more easily handled in women than in men, as we can so readily drain through the vagina if need be. Gauze coming in contact with the point of anastomosis is, however, very prone to cause suppuration and then leakage from the bowel.

As the contents of the lower bowel are solid and usually rather hard, we have erred on the safe side and in each case brought out a loop of the descending colon and attached it to the skin, being prepared to open the bowel with the cautery if the slightest unfavorable symptoms should present themselves.

*Diagnosis.*—*Pelvic abscess, with retroverted myomatous uterus. Actual condition: Rectal diverticula, with rupture into the surrounding rectal fat, producing a definite tumor. Small abscess between the tumor and the pelvic floor\** (Fig. 10).

*History.*—This patient was seen early in February, 1904, in consultation with Dr. S. T. Haffner. She was 60 years of age. For some time she had experienced slight difficulty in defecation, and for a few days had been running a temperature varying from 100 to 103° F.

*Examination.*—On vaginal examination, I found the uterus somewhat enlarged. Posterior to it, and apparently continuous with it, was a globular mass. This was very hard and resembled a myoma in contour. There was, however, a hard ridge over its lower portion, as is so often noted where pelvic abscess exists.

*Operation.*—On February 13 I made a small incision in the vaginal vault just posterior to the cervix, and after peeling back the mucosa entered Douglas' pouch with a pair of blunt artery forceps. A very small amount of pus and a few flakes of fibrin escaped, but the mass was in no way diminished in size. Realizing the presence of an unusual condition, I packed the opening in the vault and immediately entered the abdomen from above. Filling Douglas' sac almost completely was a tumor mass evidently springing from the sigmoid flexure, which had rotated 90 deg. and had become firmly embedded in the pelvis. It closely resembled a rectal cancer. On careful manipulation it was brought out of the pelvis, and on inspection no lymph glands were demonstrable. The diseased segment of gut was removed and an end-to-end anastomosis done with Connell and Lambert sutures, the former being employed at the mesenteric junction and for about two-thirds the circumference of the gut. A portion of the descending colon was brought up into a small incision in the left

\* Reprinted from the *Journal of the American Medical Association*, November 1, 1904.



inguinal region and made fast, so that if occasion demanded it could be opened with a thermo-cautery at a moment's notice. Drains were then introduced into the vagina and also through the lower angle of the abdominal incision. At the end of the fourth day there was considerable abdominal distension and the



FIGURE X.—DIVERTICULA OF RECTUM WITH ABSCESS BETWEEN —  
BOWEL AND UTERUS.

patient was very weak. We accordingly opened the descending colon at its point of attachment to the abdominal wall and at the same time forced the patient's nourishment. She promptly recovered. The small fistulous opening was a few weeks later readily closed under local anesthesia, and the patient is now (March 1, 1906) perfectly well.

*Examination of Tumor.*—On laying the tumor open we found that there were two rectal diverticula passing out into the adipose tissues, and communicating with the lumen of the gut by openings not more than 1 mm. in diameter (Fig. 10). The larger diverticulum was 1 cm. in diameter and filled with a fecal mass. The floor of this diverticulum had given way, and the surrounding fat was everywhere infiltrated by inflammatory products. The excessive hardness of the tumor was due to replacement of the fat in many places by recent connective tissue. The small abscess between the tumor and the pelvic floor was due to the extension of the inflammatory process to the peritoneum of Douglas' pouch. The diverticula were lined by atrophic mucosa.

A rectal examination of this case would have yielded little information beyond the detection of some narrowing of the lumen of the bowel, which is often present in cases of pelvic abscess. In this case cancer of the bowel might very readily have been diagnosed and a colostomy performed.

Immediate Examination of Uterine Mu-  
cosa and Myomatous Nodules after  
Hysteromyectomy to Exclude  
Malignant Disease.

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BALTIMORE.

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CHICAGO:

PRESS OF THE AMERICAN MEDICAL ASSOCIATION,  
ONE HUNDRED AND THREE DEARBORN AVENUE,  
1906.

IMMEDIATE EXAMINATION OF UTERINE MUCOSA AND MYOMATOUS NODULES AFTER HYSTEROMYOMECTOMY TO EXCLUDE MALIGNANT DISEASE.\*

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BALTIMORE.

It has long been known that sarcomatous changes may occur in myomata. In 1860<sup>1</sup> Virchow gave a very clear account of the gross and histologic pictures in such cases. In 1872<sup>2</sup> Chrobak drew attention to this class of cases, and in 1887<sup>3</sup> Ritter gave a full survey of the literature up to that date. The question was fully discussed by Williams,<sup>4</sup> as well as by Schreiber,<sup>5</sup> in 1894; and in 1895 by L. Pick.<sup>6</sup> The article of Gessner,<sup>7</sup> published in 1899, is the most exhaustive that we possess, and will well reward a thorough study. Among the more recent and lucid articles is that of Wier,<sup>8</sup> published in 1901, and that of Jacobi and Wollstein,<sup>9</sup> which appeared in 1902.

But it was the excellent paper by Charles P. Noble,

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\* Read, before the Johns Hopkins Hospital Medical Society.

1. Virchow: *Die Krankhaften Geschwülste*, vol. III, p. 201.

2. Chrobak: *Arch. f. Gynäk.*, vol. IV.

3. Ritter: Inaugural Dissertation, "Ueber d. Myosarkom," Berlin, 1887.

4. Contributions to the Histology and Histogenesis of Sarcoma of the Uterus. J. Whitridge Williams, *American Jour. of Obstetrics*, 1894, vol. xxix, No. 6.

5. Schreiber: "Ueber d. Complication von Uterusmyom mit secundärer sarcomatöser Degeneration," Diss. Inaug., Jena, 1894.

6. Pick, L.: "Zur Histogenese und Classification der Gebärmutter-sarcome," *Archiv. f. Gynäkologie*, 1895, vol. xlviii, p. 24; and "Zur Lehre vom Myoma sarcomatosum und über die sogenannten Endotheliome der Gebärmutter," *Arch. f. Gynäkologie*, 1895, vol. xlix, p. 1.

7. Gessner: *Velt's Handbuch der Gynäkologie*, 1899, vol. III, 2d half, p. 957.

8. Wier, Wm. H.: "Muscle-cell Sarcoma of the uterus," *Amer. Jour. of Obstetrics*, 1901, vol. xlili, p. 618.

9. Jacobi, Mary Putnam, and Wollstein, Martha: *Amer. Jour. of Obstetrics*, 1902, vol. xlv, p. 218.

that first thoroughly aroused gynecologists to an appreciation of the possible danger of allowing myomata to remain year after year without operative interference. His paper was closely followed by those of Hunner and McDonald. In going over the large number of myoma cases that we have had at the Johns Hopkins Hospital I have been surprised at the number of instances in which myomata were associated with carcinoma either of the cervix or body, and at the relatively frequent pictures of sarcomata developing in myomatous tumors. All these cases will shortly be reported in detail by Dr. Kelly and myself.

These findings have a very practical bearing, and at the New Orleans session of the American Medical Association in May, 1903, I advised opening the uterus immediately on its removal as a routine procedure to see if by any chance carcinoma of the body existed.<sup>10</sup> Since that meeting I have seen several cases that indicate a still further precaution, namely, that we not only carefully explore the uterine cavity at once, but also examine the myomatous nodules. Had such a precaution been adopted in the present case there is a strong probability that the patient might have been saved. The uterus on removal showed nothing unusual. On opening the uterine cavity the mucosa was found everywhere intact and apparently normal. Further examination in the operating room was not undertaken and the specimen was sent to the laboratory. There a longitudinal section was made through the tumor and some degenerative changes were noted, but through an unfortunate circumstance no further examination was made. It was not until after the second operation, more than two years later, when we found a sarcoma springing from the cervical stump, that the original tumor was again examined. The most casual glance showed not only areas of hyaline degeneration in the myoma, but also round and irregular areas of typical sarcoma.

*Supravaginal hysterectomy supposedly for simple interstitial and subperitoneal myomata. Two years later sudden collapse due to hemorrhage from a sarcoma developing from the cervical stump (Fig. 1). Re-examination of the original tumor showed typical sarcomatous transformation of the myoma (Fig. 2). Later intestinal*

10. Thomas S. Cullen: "Sarcomatous Transformation of Myomata." *Journal A. M. A.* Aug. 8, 1903.

*obstruction; artificial anus with complete control. Death eight months after the second operation.*

*Patient.*—Mrs. W., aged 42, was seen in consultation on Jan. 22, 1903. For several years the menstrual periods have been exceedingly free. From time to time she has been treated for dyspepsia and for some cardiac lesion, but not until recently has any abdominal enlargement been detected. She is well nourished, but is exceedingly pale. The mucous membranes are blanched and the hemoglobin is 30 per cent. On vaginal examination the cervix is found to be normal. Filling the vaginal vault and extending half way to the umbilicus is an irregular myomatous uterus. Above and to the right is a globular mass the size of a kidney. One of the most interesting phenomena is a bruit felt by the examining finger along the course of the left uterine vessels.

*Operation.*—The uterus was brought up without much difficulty and the large mass felt in the region of the liver proved to be a subperitoneal and pedunculated myoma. The uterus was removed from left to right. The left tube and ovary were not disturbed. The patient stood the operation well and lost very little blood. Phlebitis developed some days after operation, but did not retard her progress very much. Within a month her color had returned, and in less than three months she was in perfect health. I saw her on Jan. 1, 1905, and she was in excellent condition.

*Second Operation.*—Feb. 17, 1905. The patient felt perfectly well and went to market yesterday morning. About 1 p. m. she was taken with pain in the lower abdomen, and a little later on almost fainted while at stool. Dr. Gorter was called to see her and advised immediate removal to the hospital.

On examination, under anesthesia, we found the *per vis* partly filled by a mass about the size of a small coconut. This apparently involved the left side more than the right. The left ovary having been saved at the previous operation, we thought that this tumor was certainly ovarian in origin. On opening the abdomen the left ovary was found to be perfectly normal, but projecting from the stump of the cervix and extending down between the cervix and rectum was a definite sarcomatous nodule fully 10 cm. across (Fig. 1). This was somewhat lobulated. It had been slightly lacerated and free bleeding had occurred. We removed at least a quart and a half of free blood and clots from the abdominal cavity. Her sudden discomfort was evidently due to partial tearing of the growth. We were able to peel the growth out to a great extent, but it was impossible to remove it in its entirety.

The left lobe of the liver was sharp, the right lobe very blunt and thickened. We thought that we were dealing with a hepatic metastasis, but on continuing the incision upward found there was merely thickening of the liver. The omentum was free. The appendix was removed.

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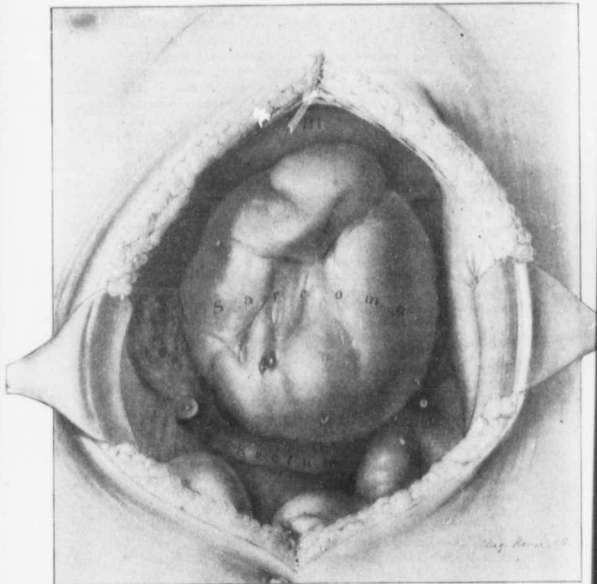


Fig. 1.—Sarcoma developing in the cervical stump. (Gen. Path. No. 8270.) The pelvis is viewed from above. Rising from the pelvis between the bladder and the rectum is a smooth lobulated growth presenting a somewhat scarred appearance. To the left is the intact and normal left ovary. The right appendages were removed at the first operation.

The condition is particularly interesting when we remember that the uterus had been removed fully two years before and that for two years the patient had remained perfectly well.

*Postoperative History.*—Patient was readmitted to the Church Home Aug. 21, 1905. For the preceding four or five weeks she had had great difficulty in securing an evacuation



Fig. 2.—Sarcomatous transformation of a uterine myoma. Supravaginal amputation with return of the growth in the cervical stump. (Natural size.) (Gyn-Path. No. 6421.) The picture represents a longitudinal section through the entire uterus. *a*, Upper limit of the uterine cavity; *b*, lower or cervical portion. It is thus seen that the myoma occupying the posterior wall projected into the uterine cavity and put the mucosa on tension. The myomatous nodule is approximately circular and in many places yields the usual myomatous striation. At *e* is an area of typical hyaline degeneration recognized by its homogeneous appearance. At numerous points indicated by *d* we find sharply outlined granular or spongy areas which are at once recognized as sarcomatous. At *e* along the outer margin of the myoma are areas of sarcoma and the tissue between *f* and *f'* is partly myoma, partly sarcoma; *g* is an area of calcification.

3. (Gyn-Path. No. 6421.) The picture represents a longitudinal section through the entire uterus. To the left is the uterine cavity.

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of the bowels. On examination we found that the pelvis was practically filled with a new growth and that it would be necessary to make an artificial anus. The bladder showed definite involvement by the growth and the urine contained large quantities of blood. I made an incision through the left rectus, brought out the sigmoid flexure, cut it in two, closed the lower end, brought the upper end out through the rectus, passed it outward beneath the sheath of the rectus for about an inch and a half, then made a longitudinal section through the sheath of the rectus and through the fascia to the skin, attaching the bowel to the skin. The bowel, therefore, was brought upward, then outward and then upward again. The patient experienced a great deal of relief. Her bowels moved once or twice a day, but she had practically absolute control, as there was no escape of fecal matter except at stool. She improved considerably. Occasionally there was some discomfort from the rectal tenesmus due to the ever-increasing growth pressing on the remaining portion of the rectum; otherwise she was comfortable. She remained in the hospital until about the first of October. During the last two weeks of her life she became much weaker and died Oct. 30, 1905.

*Description of the Sarcoma Developing from the Cervical Stump.*—The specimen (Fig. 1) consists of a mass of tissue 10 by 8 by 5 cm. It is somewhat lobulated, is rather smooth and on its under surface has a basal attachment, extending over an area of about 5 by 5 cm. The tissue is of brain-like consistency, yellowish white in color. It tears with the utmost readiness. On section the mass is found to contain a large irregular area of hemorrhage. At one point is a cystic space 2 by 1.5 cm. This is divided by trabeculae into smaller spaces and is filled with blood clots. The general character of the growth is clearly evident without histologic examination.

*Histologic Examination.*—The tumor is found to be made up of a sea of cells. Most of these cells have oval, vesicular nuclei and bear a striking resemblance to those of muscle fibers. The cells themselves are spindle-shaped, with deeply-staining nuclei two or three times the natural size. Others are irregular and also stain deeply. Again we have masses of protoplasm containing five or six deeply staining nuclei. At other points there are giant cells where the nuclei are not over one-third the usual size. In places are seen spindle cells undergoing division. There are large irregular plaques of protoplasm containing fragmented nuclei and cells showing typical nuclear figures. The nucleus itself is sometimes dividing into five or six young nuclei. The blood vessels are large and abundant. The majority of them appear to be veins. Some are filled with thrombi, and the tumor cells are gradually obliterating them. In fact, dividing tumor cells can be demonstrated lying free in such blood vessels. In some places the tissue is much rarified, and in such areas giant cells are particularly abun-

dant. The growth is essentially a spindle-celled sarcoma which shows a marked tendency to giant cell formation.

*Description of the Original Tumor.*—The specimen (Fig. 2) consists of a globular uterus, approximately 18 cm. in diameter. It is smooth and glistening. On the surface one or two nodules can be detected. Attached to the right cornu is a kidney-shaped subperitoneal nodule 13 cm. in length and 8 cm. broad. It is attached by a pedicle, 2.5 by 1.5 cm., and is freely movable. The uterine cavity is 17 cm. in length and is markedly convex, owing to the fact that the growth projects inward from the posterior wall. The mucosa, on the whole, looks normal, but is atrophic. Near the fundus it has undergone in some places almost complete atrophy, the growth in the posterior wall shining through.

The greater enlargement of the uterus is due to a circular nodule, 13.5 cm. in diameter, occupying the posterior wall. This nodule is almost spherical. The central portion has, in part, undergone typical hyaline degeneration, as is evidenced by large and small spaces traversed by delicate trabeculae. On careful examination there are several areas presenting a homogeneous spongy appearance. These form a part of the myomatous tissue. They vary from 1 to 4 cm. or more in diameter, are irregular in their distribution, and have undoubtedly developed from the myomatous tissue. They give the characteristic appearance of sarcoma, and are distributed throughout the solid portion of the tumor, being also intermingled with areas of hyaline degeneration. Macroscopically one is able to diagnose with absolute certainty that we have a sarcoma developing in the myoma. The uterine wall posterior to the tumor varies from 1 to 1.5 cm. in thickness, and in some places there is a covering from 2 to 5 mm. of uterine muscle separating the growth from the mucosa.

*Histologic Examination.*—The areas indicating hyaline degeneration are entirely devoid of nuclei. Here the tissue has undergone the usual complete hyaline transformation. Many sections have been taken from the areas suggesting sarcoma. In the majority of these, most of the elements have undergone complete coagulation necrosis. Here and there, however, in the vicinity of the blood vessels, are a good many small round cells. In some of the sections, in which there is incomplete hyaline degeneration, we have a good many muscle fibers still preserved, and there are quantities of mast cells. The nuclei of the muscle fibers show considerable variation in size and in staining properties. One is instantly reminded of a sarcomatous transformation. In the more characteristic sarcomatous areas where the cells are still preserved we see the same histologic changes. The nuclei are four or five times the natural size, are irregular in outline and stain very deeply. In other places we have very large irregular cells with protoplasm which takes the eosin staining deeply, and irregular nuclei

situated in the center or at the margin of the cells. Again, some cells contain six or seven nuclei. The picture instantly suggests sarcoma, but it is impossible to tell with certainty whether the growth really started in the muscle fibers or whether it originated from the connective tissue. On the whole, we think that the evidences of muscle origin are the more reliable. In some of the hyaline areas the blood vessels still persist, but the endothelium is present and the cells of the vessel wall are stained deeply and are irregular, suggesting that the connective tissue of the vessel wall is also undergoing a malignant change. The deeply staining cells stand out in sharp contrast to the surrounding areas of hyaline degeneration. Both macroscopically and microscopically areas of calcification are evident. At no point do we find any evidence that the sarcoma extends below the confines of the myoma.

After thinking over this case the surgeon will naturally ask, "Why should we not do a complete hysterectomy in all cases?" The supravaginal operation is the easier one; it leaves a better support to the pelvic floor, there is less danger of tying the ureters, and, as the blood supply of the bladder is little interfered with there is less likelihood of a postoperative cystitis. The advantages of the supravaginal operation appear to more than outweigh the dangers from malignant changes occurring in or associated with myomata. This case, however, clearly indicates that we should carefully examine not only the uterine mucosa for carcinoma, but also the myomata for sarcomatous changes before the cervical stump is closed.

3 West Preston Street.

## A Series of Interesting Gynecologic and Obstetric Cases.

I.—An Eighty-Nine Pound Cystic Myoma. II.—A Large Parasitic Myoma. III.—Multiple Perforation of the Uterus Due to a Macerated Fetus. IV.—Abdominal Pregnancy of Four Years' Duration. V.—Chorioepithelioma.

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535 N. DEARBORN AVENUE,  
1907.

A SERIES OF INTERESTING GYNECOLOGIC

AND OBSTETRIC CASES.

1.—AN EIGHTY-NINE YEAR OLD GYNEC. MYOMA. II.—A LARGE PARASITIC MYOMA. III.—ALTERED REGULATION OF THE UTERUS AND TO A MAGNIFIED PERIN. IV.—ABNORMAL PRESENCE OF FOUR YAKAB' DERATIONS. V.—CHROMOGENETICALLY

THOMAS S. CULLEN, M.D.

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BALTIMORE.

STUCCESSFUL REMOVAL OF AN EIGHTY-NINE YEAR OLD GYNEC.

MYOMA IN FACT.

As will be noted from the following history, this patient was cognizant of the fact that the tumor had existed for over 20 years. At that time she was under the care of Dr. James Bosley. Further, it will be seen that this large growth did not prevent her from looking after her household duties until recently, and less than three months before the operation she took a 150-mile trip with no ill effects. This, so far as we can learn, is the largest myoma of the uterus that has been successfully removed. The patient is now, eight months after the operation, in perfect health and is gaining rapidly in weight.

Case I.—Mrs. MCA., aged 58, was seen in consultation with Dr. Marshall Smith, June 25, 1906.

*History.*—Twenty years ago she noticed a tumor in the lower abdomen and later was seen in consultation with Dr. W. T. Howard, emeritus professor of gynecology in the University of Maryland, who at that time advised an operation. Some time after this she was delivered of a healthy child, now 18 years of age. This patient, although suffering from a large abdominal tumor, was able to go around and to do her work until three weeks before I saw her. Her chief inconvenience had been her inability to lie on her back in bed. And sometimes when she would get "stalled," it was necessary for her husband to turn her over quickly, otherwise she would have suffocated. For two weeks before admission she had a temperature sometimes

reaching as high as 103 F. She was admitted to the Church Home and Infirmary July 27, 1906. There was considerable edema of the lower part of the abdomen and some edema of the legs. On admission to the hospital her temperature was 100 F., pulse 105. On the morning of operation the temperature was 100 F., pulse 100, respiration normal.

*Operation.*—July 30, 1906. Prior to receiving the anesthetic the patient was thoroughly washed and all preparations for operation were made, so that she might remain as short a time as possible under ether. It was impossible for her to lie down, consequently she was operated on in the sitting posture. An incision was made over the most prominent part of the tumor and I attempted to puncture it; the growth, however, started to bleed and no cystic fluid escaped. I continued the incision upward, for the reason that many large veins projected into the tumor from some structure above. The incision was gradually continued upward until the xiphoid was reached (Fig. 1). We found that the large vessels going to the tumor were omental in origin and that they were spread out over the entire upper surface. Some of them were fully 7 or 8 mm. in diameter. The tumor was densely adherent to the anterior and to the lateral abdominal walls. These adhesions were gradually shelled off with the hand, but I had to use the utmost care and do all liberating under sight, as the rupture of one large vein might have caused the loss of the patient's life before the hemorrhage could have been checked. Accessory vessels also passed from the stomach and the liver to the tumor. The pedicle of the tumor was not more than 1.5 cm. in diameter and was situated directly beneath the ribs. On removal of the tumor I found that I had brought away a piece of liver tissue 3 cm. in diameter. We had no liver needles handy, so I used sharp Hagedorn needles, running the eye through instead of the sharp end. This device answered admirably and the liver bleeding was easily checked by four catgut sutures. The uterus and the right tube and ovary lay under the surface of the liver. Anticipating the possibility of great difficulty in controlling the tumor, we had prior to operation sterilized a large foot-bath and covered it over with a sterile sheet. The foot-bath held about one-third of the tumor and the person who took charge of it was able to guide the tumor in the desired direction without allowing it to slip from his grasp. The tumor was drawn downward and outward and finally delivered from the abdomen. In the lower part it was extraperitoneal. I closed the abdomen, but left a small cigarette drain in the extraperitoneal pouch just over the symphysis.

*Postoperative History.*—The patient stood the operation well, but was commencing to collapse by the time we finished. She was under ether for one hour and twenty minutes; 200 grams of ether were used. The operation, from the incision to complete closure, took fifty-five minutes; a much longer time would

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have been consumed had it not been for the combined assistance of both the Johns Hopkins and Church Home staffs. The patient's temperature rose to 102.2 F. within eight hours after operation, but dropped to 100 F. by evening. The highest pulse rate was 130. There was no postoperative vomiting. The legs were bandaged on account of the edema. The patient voided urine on the evening of the day of operation. She was catheterized only once. The usual after-treatment was employed. On the fourteenth day she had considerable discomfort from frequent stools. The diarrhea persisted off and on for a couple of weeks. At this time, however, the weather was excessively hot and diarrhea was general throughout the hospital. It affected chiefly those patients who were somewhat weak. The



Fig. 1.—Tremendous abdominal enlargement due to a cystic myoma. The abdomen is markedly and uniformly distended and the growth extends down almost to the knees. It will be noted that there is no sagging in the flanks. Coursing over the surface were very large vessels. When it is realized that the abdominal incision extended from the xiphoid cartilage down over the entire length of the tumor and then back to the symphysis it is readily seen that the incision was nearly 4 feet in length.

patient on admission to the hospital weighed 174 pounds. Twenty-three days after operation she weighed 80½ pounds. The condition of the abdomen in this case was particularly interesting. I did not even resect a portion of the abdominal wall, because we had to save as much time as possible during operation. At the first dressing it was noted that the ribs extended out fully 6 inches from the abdomen and that the recti muscles lay on the bed on either side, while there was a good deal of loose and wrinkled skin covering the abdomen. Another interesting point was that the gauze, which drained the extraperitoneal pocket just at the symphysis, now lay in the

middle of the abdomen as the tissues were gradually contracting. After the lapse of two weeks the recti muscles could be felt gradually contracting and coming in and the costal arch was flattened down to some extent. When I examined her six weeks after operation the recti muscles were well up in the abdomen, being not over 10 cm. apart. The skin had contracted down wonderfully. The pendulous skin over the symphysis had retracted to a marked extent and the ribs were almost in their normal position. At the time of operation there was a good deal of edema of the abdominal walls. There was also edema of the legs and of the buttocks. Although the utmost care was used, a bed sore developed several days after the operation, there being a black slough over the sacrum 6 cm. in diameter and surrounded by a faint red halo. It had resulted from pressure on the table. The patient had marked edema of the back, but was forced to sit up during almost the entire operation. After she went home she rapidly regained her strength. The bed sore gradually diminished and in time entirely healed. It is astonishing that she had so little inconvenience after the operation.

*Description of Tumor.*—Miss N. Ellicott, superintendent of nurses, weighed the tumor immediately after its removal; the net weight, after deducting that of the vessel in which it lay, was exactly 89 pounds. The thin part of the tumor lay posteriorly, otherwise we might have evacuated the tumor. Had we done so, however, it would have been much more difficult to have gotten at the large vessels, which we encountered at almost every point. Had this condition persisted much longer the posterior wall of the tumor would certainly have given way and then operation would have been almost out of the question. As it was, the hardened specimen collapsed of itself when placed on the table.

*Macroscopic Examination* (Gyn. and Path, No. 10382).—The hardened specimen is about 50 cm. in length, 45 cm. in breadth and approximately 25 cm. in thickness. Over the entire anterior surface and laterally are numerous adhesions. Attached to the upper border is an area of omentum 20 cm. in breadth and the hardened vessels range from 5 to 6 mm. in diameter. The pedicle of the tumor is 1.5 cm. in breadth, 1 cm. in thickness and the portion removed is 1.5 cm. in length. Situated just beneath the pedicle and attached to the surface of the ovary is a piece of liver substance 3 by 2 cm. (Fig. 2). On pressure the tumor in part seems to be solid, in part cystic. At operation when I attempted to puncture the tumor, nothing but blood was encountered. The growth is, however, evidently made up of one large cystic space and numerous smaller ones, together with the semi-solid area. Over the part that is cystic the muscle fibers have been greatly stretched and thinned out and there are little hernial projections, the picture being analogous to that found in a slightly sacculated urinary bladder. On section the greater part of the tumor is found to consist of one



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cavity, which is approximately 42 by 35 cm. The walls vary from 2 mm. to 5 cm. in thickness. Only at one point is the wall very thin, namely, on the under surface where it lay over the vertebral column. The greater part of the wall consists of simple myomatous tissue, but at numerous points small cystic areas are visible and the tissue has undergone the characteristic hyaline transformation. One of the cysts measures 2 by 3 cm. The inner surface is covered with blood and the greater part of the tumor is filled with blood, which has undergone coagulation during the hardening.

*Microscopic Examination.*—On histologic examination the growth is seen to be made up of typical myomatous tissue. In many areas hyaline transformation has taken place and at

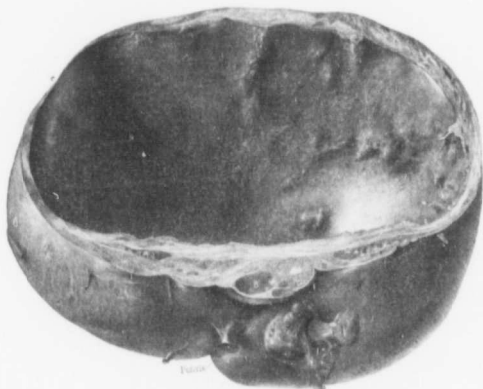


Fig. 2.—Cross-section of a cystic myoma weighing 89 pounds. The pedicle is clearly seen and in the fresh specimen is not over 1.5 cm. in diameter. Attached to the top over the pedicle are the tube and ovary and near the tube is a piece of liver substance. The tumor has been converted into one large cavity the walls of which consist of muscle. In the walls are numerous cystic spaces particularly well shown at the points indicated by *a*. There are several large cystic dilatations in the wall. The largest is indicated by *b*. The myomatous walls vary from 5 cm. to 1 or 2 mm. in thickness. At the point *c*, where the tumor lay over the vertebral column, the wall is exceedingly thin. The entire inner surface is lined by partly organized blood clots, which give the growth a very shaggy appearance. The entire tumor was filled with blood. The outer surface of the tumor is in many places covered by adhesions containing large vessels.

some points there is typical liquefaction. The inner surface of the cyst has no epithelial lining; it is covered with blood which is faintly organized.

Dr. Herbert P. Cole, in looking over the literature for me, has found in all about 240 cases of large tumors of the uterus.

The largest authentic successful case found was that of Clarence Webster. The tumor weighed 87 pounds. This was also a cystic myoma and much of the fluid was removed before the tumor was extirpated. Among other successful cases is that of Eastman, in which the tumor weighed 60 pounds.

There are numerous instances of tumors weighing from 40 to 60 pounds. Keith, for example, reported one of 52 pounds, and in Dr. Kelly's service at Johns Hopkins we have had very large ones. Knowsley Thornton reported an instance of a fibrocystic tumor weighing 91 pounds; Tait reported one of 68 pounds, and Stockard one of 135 pounds. Stockard's patient died after tapping. McIntyre of St. Louis operated on a patient with a tumor weighing  $93\frac{1}{2}$  pounds. The woman died of peritonitis.

Platonoff saw a patient with a tumor weighing 90 pounds. Two unsuccessful operations were performed and the woman died of gangrene without removal of the tumor.

Hunter speaks of a 140-pound tumor seen at autopsy. Gilliam says that 200-pound tumors have been seen. Such data, however, are hardly reliable unless careful histologic examinations have been made. The tumor in Webster's case weighed just two pounds less than ours. The operation was performed Dec. 16, 1902. There were numerous adhesions, and the entire growth was removed under Schleich's solution and a few drops of chloroform.

Those wishing to get full data on this subject should read the articles by George W. Johnson,<sup>1</sup> G. Piquand,<sup>2</sup> Joseph T. Johnson,<sup>3</sup> McIntyre<sup>4</sup> and Clarence Webster.<sup>5</sup>

1. Johnson (G. W.): Collected Cases of Fibromata of the Uterus with Tables. Amer. Jour. Obst., 1885, 1272.

2. Piquand (G.): Les Tumeurs Fibro-Kystiques de L'Uterus. Rev. de Chir., 1906, xxxiii, 462.

3. Johnson (Joseph T.): Amer. Jour. Obst., December, 1891, 1429.

4. McIntyre: THE JOURNAL A. M. A., 1891, xvii, 13.

5. Webster (Clarence): Jour. Obst. and Gyn., Brit. Empire, August, 1903, 135.

A LARGE PARASITIC MYOMA WITH MARKED DEVELOPMENT OF THE OMENTAL VESSELS, SOME REACHING 1 CM. IN DIAMETER.

At Johns Hopkins Hospital we have been studying with a great deal of interest the gradual weaning away, as it were, of pedunculated myomata from their parent



Fig. 3.—A large parasitic myoma, which weighed 18 pounds and was attached to the uterus by a pedicle 2x.5 cm. At the top is a broad omental adhesion carrying vessels to the tumor. At *b* is a cross-section of a portion of the "rope of omental vessels," which pass down beneath the tumor to *b* and then turn upward again, plunging into the tumor. *a* represents one of the largest vessels, which stand out prominently. Crossing these large vessels are numerous adhesions. *c* is a portion of the large vessel which passed down perfectly free from the omentum to the under surface of the tumor.

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blood supply in the uterus. As the pedicle becomes smaller the blood supply from the omentum becomes more vigorous until eventually the uterus forms an insignificant source of nourishment and the omentum, as in this case, sends in very large vessels. I have studied a large series of such cases, which will be published by Dr. Kelly and myself at a later date. In the more advanced cases the omental fat disappears completely and the vessels lie just between two peritoneal folds. In this case the cord of omental vessels forming a rope 6 cm. in diameter seems almost unique.

CASE 2.—C., a colored patient of Dr. Scheller, of Hagerstown, was admitted to the Hagerstown Hospital, Aug. 4, 1906. She had had an abdominal tumor for five years. The tumor rose abruptly and projected fully 18 inches from the general abdominal contour. The vagina posteriorly was greatly encroached on.

*Operation.*—On opening the abdomen a tumor was encountered which was adherent everywhere to the anterior abdominal wall and also laterally. Running into the anterior surface of the tumor from its upper end were blood vessels, some of them nearly 1 cm. in diameter. They were spread out over an area 16 cm. in breadth. Passing down the right side of the tumor and lying beneath it was a regular rope of blood vessels (Fig. 31). These lay perfectly free from the surrounding structures, could be lifted up, were covered with peritoneum and were evidently omental; but no fat was present. These vessels formed a mass 6 cm. in diameter and looked and felt like small masses of snakes. They could be traced down to the lower end of the tumor, where they spread out over its surface and plunged into its substance. One of the vessels, 5 mm. in diameter, passed down by itself and lay absolutely free. It was isolated for a distance of 18 cm., being devoid of any attachment whatever. It originated in the omentum and extended downward and plunged into the tumor. After liberating the vascular supply we found that the tumor was attached to a small myomatous uterus. The pedicle was 3 cm. in breadth, 5 mm. in thickness and contained but one blood vessel of any size. The pedicle was cut and the tumor delivered. In the vessels passing from the omentum we encountered, as a rule, one artery and two veins. The artery was about one-third the size of a vein. As the patient's condition became rather serious, although she had not lost more than two ounces of blood, we ceased the operation, the patient still retaining her myomatous uterus and a second myoma fully 25 cm. across. This also had vessels from the omentum plunging into its upper part and was attached to the uterus by a pedicle 2 cm. in diameter. As soon as the patient regains her strength thoroughly I hope to remove the uterus and the large parasitic myoma.

*Result.*—The patient made a satisfactory recovery and left the hospital about six weeks after her admission.

*Description of Specimen.*—On examination of the hardened specimen, it is found to be 23 cm. in length, 25 cm. in breadth and 20 cm. in its anteroposterior diameter. It is markedly nodular, exceedingly hard and weighs 18 pounds. The upper omental attachment still clinging to the tumor is 15 cm. in width and 8 cm. in length. The omental attachment that ran down its attachment at the lower border is 20 cm. broad. Even in the hardened state some of the blood vessels are nearly 1 cm. in diameter.

DEATH OF FETUS WITH SUPPURATION; PERFORATION OF UTERINE WALLS; SUPRAVAGINAL HYSTERECTOMY; RECOVERY.

This case demonstrates how Nature, if left alone, may successfully ward off an attack of general peritonitis. Here there was suppuration in the uterine cavity, numerous perforations of the uterus—fortunately situated entirely in the anterior wall—and then successful walling off by the abdominal wall becoming adherent to the uterus.

CASE 3.—A. P., colored, aged 21, was admitted to the Cambridge Hospital, March 4, 1906. The patient had been thought to be pregnant one year before. She had been carefully watched for some time, but no further developments had taken place. She had had some slight fever. Nothing more definite could be learned, however. When I examined her the cervix was soft; the uterus was globular and lay half way between the umbilicus and the xiphoid. The growth was apparently somewhat movable.

*Operation.*—I made an incision over the growth and immediately came in contact with what looked like grumous material, which suggested a suppurating ovarian cyst. As the tissues were densely adherent, I continued the incision upward and opened up the general peritoneal cavity. On loosening the other adhesions I found the omentum adherent. This was clamped and cut. The tumor was intimately blended with the thickened abdominal peritoneum. It was shelled out as rapidly as possible, but pus oozed from the surface in various directions (Fig. 4). I thought that I was dealing with an ovarian cyst, but was surprised to find on releasing it from the adhesions that it was the enlarged and globular uterus. I amputated through the cervix. The tubes and ovaries were covered by a few slight adhesions, but were otherwise normal and were left behind. It was with the greatest difficulty that enough peritoneum was obtained to close the abdomen, as so many raw areas had been left where the uterus had been adherent to the abdominal wall. A gauze drain was introduced into

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the lower part of the incision. The patient improved rapidly and left the hospital feeling perfectly well.

*Description of the Uterus* (Gyn. and Path. No. 9810).—The specimen consisted of an irregular and globular mass approximately 18x17x15 cm. in diameter. Its surface was everywhere covered by adhesions, and at numerous points were openings irregular in shape and varying from 3 mm. to 5 mm. or more in diameter. Through these openings quantities of pus welled out during the operation. The pedicle or cut surface was 4 cm. in breadth, 3 cm. across and in the central portion of this was what looked like the cervical canal. On opening the specimen after it had been hardened we found that this tumor was the uterus (Fig. 5). The walls varied from 1.5 mm. to 4 mm. in thickness.

Fetus: Snugly filling the entire cavity was a fetus (Fig 5). The length of this fetus from elbow to axilla was 7 cm., from elbow to shoulder 8 cm. The breadth of the fetus in the axillary line was 13 cm. Other measurements could not be made on account of the distortion of the child, but it appeared to be an eight-month fetus. The skin was somewhat macerated. The child had evidently been a mulatto, as in many places the mottled appearance was still present. At other points, however, the outer skin had been rubbed off and the surface had the pale appearance of a white child. The hair which was matted up against the uterine wall was curly and black and several centimeters in length.

Placenta: The placenta occupied the lower quadrant of the uterus and projected over the cervix; there had been a partial placenta praevia. The placenta at the thickest portion was 2 cm. in thickness. Attached to the surface of the child, especially in the vicinity of the hair, was much friable, yellowish material. This looked very much like inspissated pus. It was from the surface of the uterus at points of perforation that the purulent discharge came during the operation.

Sections of Uterine Wall: Sections from the uterine wall showed that the outer surface, at certain points, particularly where it was adherent to the abdominal wall, was covered by numerous adhesions. On the protected side cuboidal cells were visible. The muscle at such areas showed a great deal of small round celled infiltration. The inner lining of the uterus was much altered. There was a good deal of canalized fibrin and also regular ribbons of hyaline and canalized fibrin. Just beneath the surface and on both sides of this were numerous small round cells and polymorphonuclear leucocytes. At a few points calcified villi could be made out. Decidual cells were still in evidence, but they had become smaller.

*Remarks.*—There had evidently been a chronic inflammation of the inner surface of the uterus coupled with an inflammatory process on the outer surface at the points where the uterus was adherent to the abdominal wall. In this case there had been

death of the fetus for some cause or other and discharge or absorption of the liquor amnii. Suppuration had taken place in the uterine cavity. At some points the uterine walls had become perforated and the pus had trickled out over the surface. Fortunately, no intestines lay in the way and the pus had glued the uterus to the anterior abdominal wall. This is certainly one of the rarest conditions to be met in the literature.



FIG. 4.—The perforated pregnant uterus as seen on removal. It is everywhere rough and covered by adhesions. In the lower part of the field is seen the stump of one tube. At points *a*, *a* are perforations of the uterus, whence pus was seen oozing out; at *b*, *b* the walls are exceedingly thin, there have been many adhesions and pus is lying on the surface. One would not for a moment take this to be the uterus except for the presence of the tube.

#### ABDOMINAL PREGNANCY OF FOUR YEARS' DURATION; OPERATION; RECOVERY.

In this case there was a typical history of a pregnancy going on apparently to term. Labor pains developed and soon ceased and the patient retained a tumor for between three and four years without any marked discomfort. It is certainly remarkable that this abdominal tumor per-

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sisted so long without giving rise to any alarming symptoms. The nourishment of the abdominal pregnancy was, of course to a great extent furnished by the omentum.

CASE 4, Gyn. No. 13272.—J. A., colored, married, aged 28, was admitted to the Johns Hopkins Hospital from the dispensary, Sept. 27, 1906.

*History.*—She complained of pain and swelling in the abdomen. Her general health had always been good and she had never consulted a physician before. Her menstrual history was unimportant. She had been married fifteen years and had had four children, the eldest nearly 15 years old. The second child was deficient mentally but lived five years. The third was 10 years and the youngest 8 years of age. Her labors had all been normal; there had never been any miscarriages. For some years she had had a slight amount of thick, white, foul-smelling discharge, more marked before and after her menstrual periods than at any other time. For several years she had been constipated, the bowels not moving for two or three days at a time. She had passed no blood nor mucus.

*Present Illness.*—About four years ago she noticed a small lump in the lower part of the abdomen. This was the size of a baseball situated below and to the left of the umbilicus. The tumor increased in size at a uniform rate and the patient thought she was pregnant. At the end of nine months the tumor reached above the umbilicus. The breasts were enlarged and contained colostrum. The patient had had no nausea or vomiting. Her menstrual periods had been regular, although she had had a very scanty flow. She was certain that she had felt movements of the child. About the time that labor should have come on she had bearing-down pains beginning in the evening and lasting until early morning. The pains ceased then and never returned. The patient thinks that she has never had any other signs or symptoms since that night. The breasts gradually became soft and dried up. The tumor seemed to decrease slightly in size. No movements were felt and the patient suffered no discomfort. She became convinced that she had a tumor.

*Symptoms:* Until about a year ago she could go about her work without difficulty, but then she began to notice a little soreness and the "tumor began bothering her."

Within the few months previous to admission she had felt an increase in the amount of soreness. She had had headaches at times, her tongue had been coated, she had frequently felt nauseated but had not vomited. After walking a good deal there was a burning sensation in the lower part of the abdomen, and during the last two months the headaches had been quite severe. The patient had to stop work on account of the burning pain that would come and go. This pain was eased by



lying down. She slept well, but her appetite was poor and she said she did not gain in weight. There was no pain nor burning on defecation or urination.

*Examination.*—Dr. Hutchins, the resident gynecologist, found



Fig. 5.—Pregnant uterus, the fetus and placenta intact. After the uterus had been well hardened the anterior surface was removed. The cervix presents the usual appearance and the uterus is firmly contracted around the fetus. The head lies in the upper portion. The left arm is firmly adherent to the left side of the chest and the skin is macerated to some extent. Situated in the lower part is the placenta which extends slightly over the internal os.

the patient rather emaciated. The abdomen was distended rather more on the left than the right side by a tumor which rose from the pelvis and reached 4 cm. above the umbilicus in the median line. The tumor felt cystic; it was movable, dull everywhere on percussion and no fluid wave was noted. On vaginal examination no evidence of infection could be found.

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The cervix was firm. There was slight bilateral laceration. The uterus was in ante-position, normal in size and apparently in no way connected with the abdominal tumor. Movement of the tumor did not draw the cervix upward. Clinically, the tumor was thought to be an ovarian cyst or a myoma, but no definite diagnosis could be made.

*Operation.*—Sept. 28, 1906. After making a long abdominal incision it was found that the abdominal cavity was occupied by a large "tumor of the left ovary," to which were adherent the omentum, the entire transverse colon, a portion of the sigmoid, and the ascending colon. The uterus was densely adherent to the right side. The omentum was tied and cut, a portion being left attached to the tumor, the proximal portion being reflected backward with the transverse colon. In doing this the thin wall of the tumor was ruptured and an ounce or two of thick creamy, yellowish material escaped. This was rapidly sponged up, and further escape controlled by pressure with gauze. In order to avoid infection, so far as possible, the right tube which had been converted into a pus sac and was adherent to the cystic tumor was liberated. The broad ligament on the left side was clamped and cut so that the tumor could be shelled out of the pelvis and tipped over to the left side. In this way the gummy contents of the cyst were prevented to a great extent from escaping into the abdominal cavity. After the tumor was shelled out there was a great deal of bleeding from the mesocolon. This bleeding was checked as far as possible by sutures and the transverse colon was then curved in on itself, so that the mesocolon formed a funnel. A gauze drain was introduced into this as it dropped down on the pelvic brim and was brought through the vagina. In this way we were able to check the bleeding almost completely. The abdomen was closed without drainage from above.

*Result.*—The patient made a very satisfactory recovery and was discharged Oct. 21, 1906.

*Description of Tumor* (Gyn. and Path. No. 10417).—The specimen consists of an abdominal tumor which was connected with the left broad ligament and the left tube and ovary. It was absolutely free from the uterus, which was not removed. The specimen in the hardened state measures 24 cm. in length, 18 cm. in breadth and 16 cm. in its anteroposterior diameters (Fig. 6). Attached to its right side are the right pus tube and the right ovary. To its left are the tube and ovary, which are plastered down on it. Covering almost the entire upper surface of the tumor is omentum, which is densely adherent to the mass and furnishes a large part of its blood supply. The walls of this tumor vary from the thickness of paper to two or three millimeters. From this tumor gummy material, like fat mixed with pus, escapes and at several points hair can be seen. On cutting a window out (Fig. 6) the interior is found to be filled with a fetus, which is of at least seven or eight

months' growth. On account of the distorted condition it is difficult to get the exact age, but the sole of the foot measures 6.5 cm. in length and looks mature. The other parts are correspondingly large. The hair of the child is black and curly.



Fig. 6.—Abdominal pregnancy of four years' duration.—The illustration is an exact reproduction of the abdominal contents and has been drawn from the specimen. The uterus is normal in size, normal in position. Attached to its right side is a large pus tube which is densely adherent to the sac. On the left side the structures are not clearly outlined, as the broad ligament was intimately attached to the pregnant sac. Passing over the anterior surface of the sac in its upper portion, and considerably flattened, is the transverse colon. Densely matted to the surface of the sac is the omentum. In the upper part of the sac a window has been cut out and to the left a hand, at the top a foot, and between these two and lying in the vicinity numerous tufts of hair represented in black may be seen. The sac passes down and almost completely fills Douglas' pouch. This tumor had lain in the abdomen nearly four years. Apart from the adhesions to the transverse colon the intestines were perfectly free.

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There are several points where slight ulceration of the surface has taken place. These points correspond to the very thin areas noted in the outer covering. The right tube, which was so firmly glued down that it was thought necessary to remove it, in the hardened state, measures 10 cm. in length. It is entirely covered by adhesions, and at its fimbriated end reaches 2.5 cm. in diameter. The ovary is also covered by adhesions, but is not enlarged.

The left ovary is very much flattened and covered by adhesions. The tube runs over into the tumor mass and is lost. It is flattened out and at one point measures .8 cm. in diameter. The placenta is attached to the left side of the mass.

*Histologic Examination.*—The sac enclosing the fetus shows that where the omentum has been adherent it has been transformed almost entirely into new and old connective tissue; even the outer adhesions which contain islands of adipose tissue are for the most part made up of dense fibrous tissue. Passing inward the fibrous tissue looks older and then hyaline areas are seen which in size and form closely resemble placental villi. Between these are many small round cells and spindle cells. The inner portion is composed of similar hyaline areas surrounded by a zone of brown pigment that has evidently resulted from an old hemorrhage. The inner surface is lined by necrotic tissue which is especially rich in canalized fibrin, containing chiefly polymorphonuclear leucocytes. In no place is there evidence of muscle fibers and it looks as if the case was one of an abdominal pregnancy in which the sac, which was partly supported by the omentum, had gone on to new connective tissue formation.

*Remarks.*—As noted in the description of the operation the uterus was in no way implicated in this growth. It was situated in the center of the abdomen and gave no signs of being half of a bicornuate uterus.

*Diagnosis.*—Abdominal pregnancy of 4 years' standing, supuration of the sac, dense omental adhesions.

**CHORIOEPITHELIOMA WITH THE UTERUS THE SIZE OF THAT OF A FIVE MONTHS' PREGNANCY; HYSTERECTOMY; APPARENT RECOVERY.**

This disease, although by no means rare, is not very common. From Baltimore only two cases have been reported. In 1895 J. Whitridge Williams,<sup>6</sup> under the title "Deciduoma: Malignum" reported a case occurring in the University of Maryland Hospital; and in the last edition of Kelly's "Operative Gynecology" a case is cited from the Gynecological Department of the Johns Hopkins Hospital. Thus at the Johns Hopkins Hospital only two cases have been encountered in 17 years.

6. Johns Hopkins Hosp. Rep., vol. IV, 1895.

By a fortunate coincidence on the morning on which I operated on the patient whose history is here given, Dr. Cuthbert Lockyer of London, England—the man who has worked so much on this subject in Great Britain—was present. Even from the macroscopic examination the gross appearance was so characteristic of the placental growth that both of us at once said "chorioepithelioma." In this case the decidual-like cells, those supposed to originate from Langhan's layer, predominated, but in some places the large sinuses, the brown-staining protoplasm and the characteristic vacuoles were in evi-



FIG. 7.—Chorioepithelioma. The specimen consists of a uniformly enlarged uterus. The cervix is perfectly normal, the body was as large as that of a five months' pregnancy. Occupying the entire body of the uterus is a new growth with many depressions and cystic spaces extending into the wall. The growth itself presents a peculiar porous appearance (b), and the finger-like process so characteristic of carcinoma is absent. In the lower part of the uterus the outer muscular walls are still clearly seen, but in the upper part of the cavity the growth has extended almost to the peritoneal surface. The growth could hardly be mistaken for anything else. It is remarkable to see such a uniform involvement of the entire uterine wall. a Indicates clearly the sharp line of demarcation between the malignant growth and the outer muscular covering.

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dence. The specimen is particularly interesting on account of the uniformity of the distribution of the growth throughout the entire uterine body.

CASE 5, Gyn. No. 13204.—The patient was admitted to the Johns Hopkins Hospital on Aug. 31, 1906, and was discharged on Sept. 25, 1906.

*Examination.*—She was not very well nourished. The mucous membranes were of a fairly good color. There was no glandular enlargement. The heart and lungs were normal. On examination Dr. Rushmore found the abdomen somewhat distended by a firm mass which rose out of the pelvis and extended as high as the umbilicus, rather more prominently on the left than on the right side. The mass was slightly movable and not tender except just above Poupart's ligament on the left side. It was regular in outline and on deep inspiration its upper border was obliterated by the surrounding intestines. The vaginal outlet was moderately relaxed, the cervix was high in the vaginal vault, lying far back and pointing downward. The cervical lips were not hypertrophied; the os was slightly patulous. There was no induration suggestive of new growth. The mass in the pelvis was uniformly fixed. On examination, under ether, the tumor seemed to be freely movable, but resembled a fibroid about 6 inches in diameter with a cystic mass on the left. The breasts contained colostrum.

*Operation.*—September 3: On exposure of the enlarged uterus the appearance suggested pregnancy very strongly. The vessels were much dilated. No definite nodules could be made out in the fundus, but on the posterior surface was a slight prominence, with a curious yellowish discoloration of the tissue beneath, and there were numerous dilated blood vessels suggestive of a malignant new growth. As a definite diagnosis could not be made from palpation we decided to incise the uterus over the prominence, at the same time carefully walling it off, so that there would be no danger of infection and the general cavity would be protected. On incision a vascular new growth was immediately seen. This had a spongy appearance and immediately suggested a malignant growth differing entirely from carcinoma and in no way resembling sarcoma. The incision was immediately closed with silk and the uterus removed. A vaginal drain was inserted in the lower angle of the abdominal wound in order to drain down to the peritoneum. The liver was carefully examined for metastases, but none could be detected.

*Result.*—The patient was examined on September 24, prior to her discharge. The abdominal incision was well healed; neither induration nor tenderness could be made out in the vaginal vault. Dr. Holland, writing me on Oct. 29, 1906, says: "I received a letter from her two days ago. She was able to be about the house, is cheerful, and is gaining in strength. She still complains of pain in the right arm which developed when she was in the hospital."

*Remarks.*—In this case there was no positive history of a recent miscarriage, although the possibility can not be excluded. The contour of the uterus on pelvic examination strongly suggested a myomatous uterus and with the abdomen opened it was impossible for one to exclude the possibility of pregnancy.

*Description of the Tumor* (Gyn. and Path. No. 10278).—The specimen consists of a greatly and uniformly enlarged uterus measuring 20 cm. in length, 13 cm. in breadth and 12 cm. in thickness. The anterior surface is smooth and glistening; the posterior is covered by many adhesions, thin and fan-like. Attached near the left cornu is a tag of omentum. On section the uterine cavity is found to be 15.5 cm. in length. The uterine walls vary from 3 to 6 cm. in thickness. The outer portion of the wall consists of muscle varying from 1 to 1.5 cm. in thickness. Lining the entire uterine cavity is a spongy, porous growth. The uterine mucosa as such is not recognized, but is represented by hills and hollows. The projections into the cavity are dome-shaped and vary from .5 to 2 cm. in depth. Here and there on the surface are cystlike depressions with narrowed bands of tissue stretching from side to side. There are also numerous cavernous spaces bridged over by bands of the growth. This growth involves the entire uterine wall, both anteriorly and posteriorly. The great thickening in the wall is due to the presence of the growth, which varies from 1 to 6 cm. in thickness. At the fundus it extends almost to the peritoneal covering. The growth in no way resembles a carcinoma, nor is there any appearance suggestive of a sarcoma. One is instantly reminded of the growths that occasionally occur after a miscarriage. The cervix is somewhat flattened, is 6 cm. in breadth, and its lips appear to be normal (Fig. 7).

*Microscopic Examination.*—Sections from the cervix show little alteration save for the fact that many of the glands are small and round, and that they appear to be somewhat dilated. Here and there they extend for some distance into the muscle. They do not, however, show the slightest evidence of any active process. The tissue lining the cavity has undergone almost complete necrosis. It is still represented, however, by a great deal of canalized fibrin containing polynuclear leucocytes, and here and there, especially in the vicinity of the large blood vessels, are areas where the cells are still preserved. These consist of large discrete cells containing small vesicular nuclei, nuclei of moderate size that have stained deeply, and still larger nuclei containing vacuoles and great masses of protoplasm staining very deeply. The protoplasm of many of the cells contains vacuoles or clear spaces. In the deeper portion, that is, in the vicinity of the muscle, there are large blood sinuses, and lining these are cells closely resembling decidual cells. They have for the most part vesicular nuclei, which vary considerably in size from very small ones to others very

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large and lobulated. Scattered throughout this decidual-like tissue are numerous vacuoles. In the vicinity is much canalized fibrin with isolated cells of a smaller character scattered throughout it. The protoplasm of these so-called decidual cells, wherever situated, is of a brownish tinge. At numerous points are isolated masses of these decidual-like cells lying perfectly free in the blood, thus showing that they are either isolated and free masses or finger-like projections cut across. In some places are large plaques of protoplasm containing six or more nuclei, and in the immediate vicinity the canalized fibrin contains collections of polymorphonuclear leucocytes. At a few points are elongated, very deeply staining masses of chromatin lying free in hyaline material. The line of demarcation between the muscle and the new growth is at some points sharply defined, but in numerous places the cells of the new growth are wandering in and completely overwhelming the muscle fibers. In the advancing margins there is a certain amount of small round-celled infiltration, and in the corresponding deeper portions there is a great tendency for the growth to undergo coagulation necrosis. This is undoubtedly a chorioepithelioma, but one in which no placenta villi are demonstrable.

*Remarks.*—The contour and general form of this growth before the uterus was opened corresponded almost identically with those of a myomatous uterus. There was on the left side a slightly nodular elevation which was most suggestive of myoma. Curettings, of course, in this case would have yielded nothing but necrotic tissue, but this should immediately have put us on our guard. Such a finding would exclude myoma and would also tend to rule out adenocarcinoma, as in an adenocarcinoma such extensive areas of coagulated necrosis are rarely to be found.

*Histologic Examination of Scrapings Four Months Before Admission to Hospital.*—These scrapings were made by Dr. Holland and fortunately had been put aside and were examined after the removal of the uterus. It will be seen that although there are a few suspicious changes no positive diagnosis could have been made.

Gyn. and Path. 10275. The greater part of the tissue is entirely necrotic; it takes the eosin stain, or when the hematoxylin is noted the cells are very cloudy. In some places there are shadows of very large nuclei and here and there the nuclei are still perfectly preserved. These, however, are elongated, some of them are irregular and stain deeply. The picture is not one that would enable a pathologist to make a satisfactory diagnosis. There are, however, islands that strongly suggest sarcoma or that, considered in conjunction with the history, suggest a malignant placental growth. The section is one that would certainly call for further examination.



SURGERY OF THE LIVER

A SERIES OF LIVER CASES IN WHICH IT WAS NECESSARY TO REMOVE A SEGMENT OF THE LIVER  
OR TO SUTURE TORN AREAS

BY THOMAS S. CULLEN, M. D., BALTIMORE, MARYLAND

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May, 1907

Reprint from

## SURGERY, GYNECOLOGY AND OBSTETRICS

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### SURGERY OF THE LIVER

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By THOMAS S. CULLEN, M.D., BALTIMORE, MARYLAND

**I**N the *Journal of the American Medical Association*, April 22, 1905, in a brief review of the literature on the surgery of the liver, I emphasized the fact that, although Brunn, in 1870, had removed a small hepatic tumor, the surgery of this organ had attracted little attention until 1886, when Lin successfully performed a partial resection. Between 1886 and the date of my paper, over one hundred resections of portions of the liver had been reported.<sup>1</sup>

In this review, reference was made to the excellent work of Keen, Tiffany, and others in America, of Terrier and Auvray in France, and of Langenbuch in Germany, as well as to the various animal experiments that had been performed. The various methods of suturing the liver were illustrated, and the great value of Kousnietzoff's liver-needles was pointed out. Since the publication of my paper, in two cases in which I found it necessary to remove wedges of the liver substance, I approximated the raw surfaces by means of blunt needles; and in two other cases, where the liver had been lacerated, I readily brought the friable surfaces together and completely checked the bleeding by the use of the blunt needles. In all of the five cases the outcome, as far as the operative technique was concerned, was eminently satisfactory.

#### REMOVAL OF A PORTION OF THE LIVER

CASE 1. Removal of a large secondary carcinoma of the liver.

CASE 2. Hysterectomy for a large myoma. Excision of the gall-bladder and removal of a wedge of liver substance, where carcinoma of the gall-bladder could not be excluded.

CASE 3. Excision of the gall-bladder and a wedge of liver substance, where there was great thickening of the wall of the gall-bladder and a suspicion of malignancy.

<sup>1</sup> Mayo Robson, in his third edition of *Gall-bladder and Bile-ducts*, reports a most interesting series of cases where he performed partial hepatectomy.

A reference to the first case will show that a secondary carcinomatous nodule, 16x14x13 cm., was cut away from the lower portion of the liver and that the raw surfaces were approximated with little difficulty. It will also be noted that very little blood was lost during the operation, and that although the patient had only one kidney, she promptly recovered, despite the fact that at the time of operation the urine from this remaining kidney contained blood and pus. It would be difficult to find a case offering less chance for a successful liver resection. It is now over two and a half years since this liver tumor was removed, and although there is a definite local return where the left kidney was taken away, the liver appears to be free from any new growth.

In our second case, operated upon in the Hamilton General Hospital, after removing a myomatous uterus which extended far above the umbilicus, we found the enlarged gall-bladder filled with stones, and in its upper portion a densely thickened area, strongly suggestive of carcinoma. In this case, after liberating and clamping the cystic duct, I removed the gall-bladder, and with it a wedge of liver substance. The bleeding was not excessive, and not having liver-needles, I used a bodkin, which can be readily obtained in any hospital or home. This case afforded, also, a rather severe test of liver surgery. The patient was a stout woman. She had been suffering for years from transitory glycosuria, and her urine contained some albumin and casts. Moreover, a tedious hysterectomy was performed before the liver complications could be dealt with.

In case 3 the patient was thin, and there were no other complications. The omentum was densely adherent to the gall-bladder, and the walls of this viscus were much thickened. We strongly suspected carcinoma, and even

after the gall-bladder had been removed, it was impossible to exclude carcinoma entirely.

#### INDICATIONS FOR RESECTION OF A PORTION OF THE LIVER

It is important to determine: 1. Whether the growth be malignant or not; and 2. If malignant, whether it is primary or secondary. In the case of metastatic neoplasms, as a rule, operation is contra-indicated, inasmuch as they are usually multiple. Primary carcinoma or sarcoma of the liver is rare. Should the hepatic growth be primary, the glands along the vessels and at the base of the liver should be carefully palpated, to ascertain whether they have become involved. This point was first insisted upon by Tuffier. In cases of lymphadenoma with secondary nodules in the liver, operation is not advisable. In all cases of liver growths the following points should be carefully considered: (a) Whether the growths be single or multiple; (b) The situation; (c) The size; (d) Whether they are pedunculated or not.

If the growths are multiple and scattered over a wide area, removal is difficult or impossible. On the other hand, provided that they are near the lower edge of the organ, resection is feasible. In fact, in the majority of cases, the situation is all-important.

The size is of little importance when the growth is pedunculated and situated near the lower margin of the liver. In the case of a large tumor, however, located near the middle of the organ, removal is exceedingly difficult or impossible. If it is located near the edge, amputation is not difficult; but if it is near the middle of the lobe, a very large portion of the liver must be resected; otherwise a cavity is left, which may be the source of an alarming or even of an uncontrollable hemorrhage. When the growth lies near the portal vein or hepatic arteries, operation is contra-indicated, since large branches of these vessels are liable to be injured, with a resulting necrosis of correspondingly large areas of liver substance and the death of the patient. If the growth be pedunculated, its removal is easier, inasmuch as the liver substance forming the pedicle is much tougher than other portions of the organ. This toughening is due to partial atrophy of liver-cells.

#### REPORT OF CASES IN WHICH PORTIONS OF THE LIVER WERE REMOVED

*A large carcinomatous tumor of the liver; removal seventeen months after nephrectomy for carcinoma of the left kidney (Figs. 1, 2, 3); temporary recovery.<sup>1</sup>*

I saw this patient in consultation with Dr. E. R. Trippé, of Easton, Maryland, on June 6, 1903. She was 30 years of age and of very slight build. For six months she had felt a small lump in the left side, but had hesitated to speak of it until a week previously. The lump was very noticeable in the region of the left kidney, and at first had increased in size only gradually, but later at a much more rapid rate. The patient was operated upon on January 8, 1903, and we found a very large carcinomatous kidney measuring 20 x 13 x 12 cm. The capsule of this was very delicate, and ruptured during the removal of the tumor, so that I did not think that the entire growth had been removed.

Histological examination of this kidney showed the growth to be a typical adenocarcinoma. The patient made a satisfactory recovery, and left the hospital after the fifth week.

On March 6, 1903, I received a letter from her, saying that she was very much improved; the wound had healed entirely, and she was feeling much stronger.

*Subsequent History.* On June 2, 1904, I received a message from Dr. Trippé, saying that the patient was not so well and her temperature was 102° F. Five days previous to this, the patient had noticed a small lump just below the free edge of the ribs, on the right side. At first it gave her no concern, but apparently doubled in size within a few days.

*Examination.* When I saw her, the tumor occupied the region between the edge of the ribs and the anterior superior spine. It was round, tense, and somewhat movable. We were very careful in our examination, fearing that it might be a friable secondary growth following the removal of the large carcinomatous kidney in January, 1903. Her pulse was rapid; the temperature was 102.5° F.

*Operation.* As she was losing ground rapidly, an immediate operation was decided upon. An incision having been made over the tumor, it was found to be perfectly smooth and free from adhesions. The incision was continued upward to the free margin of the ribs and downward almost to the anterior superior spine. The growth had originated in the liver. It was larger than a child's head and almost globular in form. The edge of the liver appeared as a slightly elevated ridge, forming a crescent over the center of the anterior surface of the growth. (Fig. 1.) Attached to the inner side of the growth was the gall-bladder. I carefully

<sup>1</sup>Abstracted from *Jour. Amer. Med. Assoc.*, April 22, 1905.

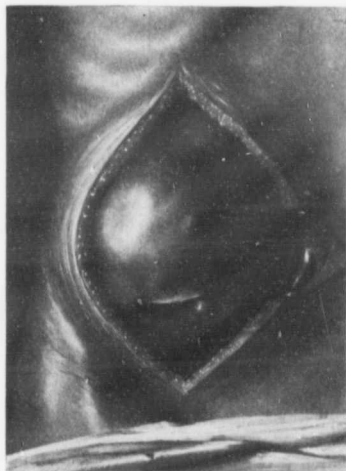


Fig. 1. Secondary carcinoma of the liver. The liver is markedly displaced downward. Occupying the greater part of the right upper quadrant of the abdomen is a hepatic tumor. Downward, this reaches almost to the anterior superior spine; medianward, it passes nearly to the umbilicus; and laterally, it makes the abdominal wall prominent. The growth seems tense, is slightly lobulated, and, although sharply outlined, gradually blends with the liver substance. The edge of the liver forms a prominent ridge along the lower margin of the growth, and the gall bladder is seen lying against the under and inner surface of the tumor. It is readily seen that when the cystic duct was severed the greater part of the liver could be rolled out of the abdomen. For a cross-section of the hepatic growth, see Fig. 2.

examined the liver, but failed to find any secondary growths, and also was unable to detect any evidence of metastases in the abdominal organs or any thickening in the renal region on the left side. The right kidney was about half as large again as usual, but was perfectly normal, considering the absence of the other. The urine, however, contained some pus and a little blood. On careful examination it was impossible to determine whether we were dealing with a cystic new growth or an abscess formation. (Fig. 2.) After some hesitation, we decided to remove the growth, together with a small part of healthy liver substance. The gall-

bladder was exposed, the cystic duct clamped and cut, and the proximal portion of the duct tied off. The lower half of the liver was then readily drawn out through the abdominal incision. It was everywhere walled off from the abdominal contents by gauze, and a gauze rope was securely fastened around the liver about an inch above the point at which the cut was to be made. A cautery was called for, but, fortunately, as after-results showed, the instrument would not work. I then took a long blunt needle and started from left to right, passing mattress sutures through the entire substance of the liver. These were about 1 cm. apart, and each overlapped the other for about 2 or 3 mm. The greater number of sutures consisted of Pagenstecher thread, the supplementary ones being of catgut. After placing two or three mattress sutures, I commenced to cut, the tumor at the same time being held taut. The sutures were then tied. This process of applying sutures and cutting and then tying was continued until



Fig. 2. Secondary carcinoma of the liver. As the specimen was very soft, it was impossible to cut it before hardening. Encircling the entire growth is a definite capsule, varying from 1 to 3 mm. in thickness. It is the sharp edge of liver substance that passed over the lower surface of the growth. This growth bears much resemblance to the parent kidney tumor, and in its central portion has undergone complete necrosis. The cut surface of the liver indicates the line of amputation. This growth measured 16x14x13 mc.

the entire growth had been removed. Five or six large blood-vessels were encountered, which spurted freely. They were picked up with artery-forceps and tied freehand with fine Pagenstecher thread. The entire growth was removed without the loss of more than two drams of blood. After the sutures had been tied, there was absolutely no bleeding from the surface. After removal of the growth there remained a raw surface fully 16 cm. in length and 6 cm. in breadth. On making traction on the sutures I found that the raw surface could be rolled in upon itself, so that the two halves formed flaps. These were brought together until little or no raw substance remained. The ends of the sutures that had already been tied were utilized to bring the opposite sides together. Iodoform-gauze was placed beneath the edge of the liver and also on its surface. Although the patient was apparently in a desperate condition when she went upon the table, she stood the operation well, and when she was taken from the operating room her pulse was only 104, and on the next day her temperature dropped to 100° F., the general condition was excellent, and the pulse 84. To look at her, one would hardly

realize that any operation had been performed. She made a rapid recovery, and left the hospital in about four and a half weeks.

November 26, 1906. About August 4, 1904, suspicious areas of thickening were noted along the renal scar on the left side. In February, 1905, Dr. Trippe informed me that from time to time some sutures had come away through a small sinus, and that later the wound had healed entirely. At the present time there is marked local return of the cancerous growth where the kidney was situated, but there is not the slightest evidence of any return of the growth in the liver. There is no doubt whatever that the patient will soon succumb to the original renal growth, but it is now\* four years since the kidney was removed, and the patient, up to a few weeks ago, had been able to go around everywhere.

*Hysteromyomectomy; excision of a large gall-bladder containing a thickened area suggestive of malignancy; resection of a wedge of liver substance with the gall-bladder (Figs. 4, 5 and 6); approximation of the cut surface of the liver by mattress sutures of catgut; recovery.*

\* January 15, 1907.

THE CHURCH HOME AND INFIRMARY

THE CHURCH HOME AND INFIRMARY

At 10:00 AM. Trippe. Admitted. Temp. 102.0. Head 2 inches. At 10:00 AM. Trippe. Admitted. Temp. 102.0. Head 2 inches.

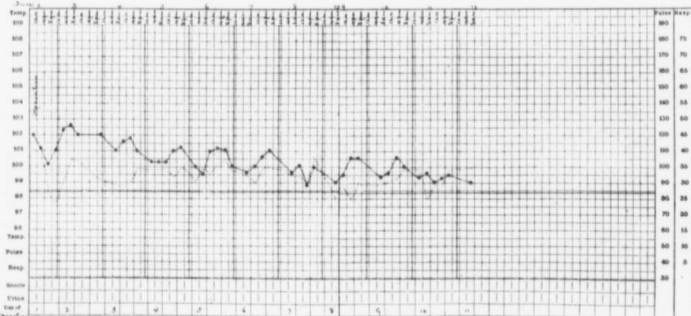


Fig. 3. At the time of operation the temperature was 102°. It gradually dropped from the time of operation, reaching normal on the eleventh day. The pulse-curve follows the temperature-curve closely.

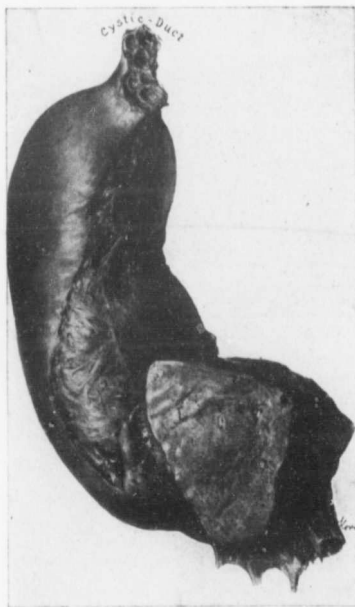


Fig. 4. A large gall-bladder removed in its entirety. In the upper part of the figure is represented a cross-section of the cystic duct and of the surrounding tissues. The gall-bladder is greatly enlarged, uniformly distended, and resembles a sausage. The raw area seen in front corresponds to the attachment of the gall-bladder. At the top of the gall-bladder, and firmly attached to it, is a wedge of liver, and attached to the surface of this are several adhesions. For the appearance of the gall-bladder on section, see Fig. 6.

Mrs. R., aged 47, seen in consultation with Dr. E. B. O'Reilly of Hamilton, Ontario, on August 20, 1906. This patient for a number of years has had sugar in the urine at frequent intervals, and has also had some albumin. Eight years ago she noticed a small lump in the uterus. This has greatly increased in size, and has been associated with much uterine bleeding. At present the tumor is larger than an adult's head, and extends above the umbilicus. The patient is a very stout, well-nourished woman, weighing nearly two hundred pounds.

**Operation.** On August 24, 1906, I operated in the Hamilton General Hospital, assisted by Drs.

O'Reilly, Griffin, and Wallace. After removal of the large myomatous uterus, it was noticed that the gall-bladder was enlarged and prominent, and that it was filled with stones, and furthermore, that, projecting from the top of the gall-bladder, there was a glistening area, which appeared to be a new growth and to extend some distance into the liver substance. Fortunately, the liver was much farther down than usual, and we were able to bring it fairly well out of the abdomen. We removed the gall-bladder and also a wedge of the liver. (Fig. 4.) We had no liver-needles with us, nor did we have Hagedorn needles, which might have been introduced eye first. We accordingly used a bodkin, and mattress sutures of catgut were then introduced, which completely approximated the raw surfaces and checked all oozing. The patient stood the operation well.

October 5, 1906. I am just in receipt of the following communication from Dr. O'Reilly, who had charge of the patient: "She is up daily, and the wound is almost closed. There is no sugar; no albumin."

November 12, 1906. I have just received the following communication from Dr. E. B. O'Reilly: "Patient leaving hospital to-morrow. Looks 15 years younger. No sugar; no albumin."

**Description of the Gall-bladder.** Gyn-path. No. 10419. This specimen consists of a large gall-bladder and a wedge of liver. (Figs. 4, 6.)

The gall-bladder is sausage-shaped, 11 cm. long and averaging 4 cm. in diameter. Attached to its upper surface are a few delicate adhesions. Where it comes in contact with the liver is a dense area 3 cm. in diameter. This, at operation, strongly suggested malignancy, and had encroached markedly on the liver substance. The wedge of liver removed is 4 cm. in breadth and 5 cm. in length, and varies from 1.5 cm. to 3.5 cm. in thickness. A small portion of the cystic duct is attached to the specimen, and averages 5 mm. in diameter.

On section, the gall-bladder walls are found to average 2 mm. in thickness. Near the cystic duct, however, there is a sacculcation 1 cm. in length, 2.5 cm. in breadth. (Fig. 6.) Here the walls vary from 0.3 cm. to 1.5 cm. in thickness. The inner surface of the gall-bladder is slightly corrugated and has delicate trabeculae. Near the cystic duct there is some pus. Almost completely filling the gall-bladder are two stones, one barrel-shaped and with a little excrescence on one side. This stone is 2.5 cm. in length, 2 cm. in breadth, and has facets on either end. Beside this is a large, irregular stone about 3 cm. in diameter. The gall-bladder also contains several smaller stones.

The thickened portion of the gall-bladder, that was attached to the liver, is 3 cm. in length and 4 cm. in breadth. It presents a pearly white appearance, and has irregular yellow mottled areas scattered throughout it. Even on section it is impossible to tell whether this

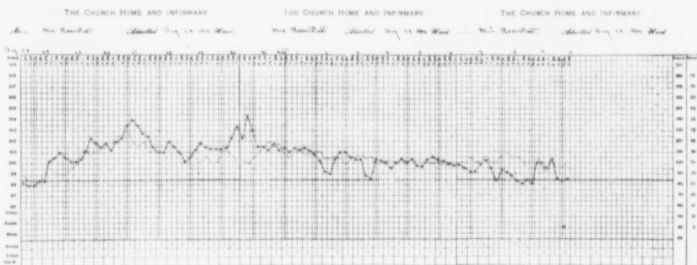


Fig. 5. At the time of operation the temperature and pulse were normal. The temperature on the evening of the day after operation rose to  $102^{\circ}$ . The next day it rose to  $102.4^{\circ}$ , and on the fourth day reached  $104^{\circ}$ , came down considerably, but did not reach normal. On the seventh day it ran up to  $104.4^{\circ}$ . From that time it slowly dropped to normal. It will be noted that the pulse-curve was similar to that of the temperature.

is malignant or not. The relation between the thickened area and the liver is most intimate, and it would be impossible to separate the gall bladder from the liver by blunt dissection without injury to the liver.

**Microscopic Description.** Sections from the inner wall of the gall bladder in many places show a typical granulation tissue, consisting of new connective-tissue cells, capillaries, and of polymorphonuclear leucocytes. In the vicinity of such areas no epithelial lining is present, but at protected points the epithelium is cuboidal or high cylindrical. Even at such points, however, the underlying stroma shows marked small round-celled infiltration.

The great thickening noted in the upper end of the gall bladder is due, in part, to massive infiltration by small round cells, but also in a large measure to the replacement of adipose tissue by connective tissue. The connective tissue of the gall bladder merges imperceptibly with that of the liver capsule, and in the liver we have quantities of small round cells surrounding the lesser bile ducts. Whether the gallstones antedated the inflammation it is impossible, of course, to determine.

**Diagnosis.** Chronic purulent cholecystitis, with extension to the inflammatory process to the liver.

*Obscure thickening of the gall bladder, with dense adhesions to the liver and omentum; cholecystectomy, with removal of a wedge of liver  $5 \times 5$  cm. (Figs. 7, 8 and 9); approximation of raw liver surfaces by mattress sutures of catgut; recovery.*

F. G., aged 32, married, white; referred to me by Dr. Stump of Phillips, West Virginia. She was admitted to the Church Home, October 12, 1906. She complained of sudden, cramp-like pains in the epigastrium. Apart from the fact that one brother had died of "scrofula" about eighteen years before, her family history was good. Her menstrual history had been of no im-

portance. She had been married fourteen years, and had had six children. Five weeks previously, she had complained of sudden, cramp-like pains in the epigastrium. These occurred intermittently for the first twenty-four hours, and the pain became so severe that she had to go to bed. She was nauseated, took several emetics, but vomiting gave only temporary relief. She remained in bed for two weeks. On the morning after the attack commenced, the patient noticed a swelling beneath the right costal margin. This caused much discomfort. By the end of the first week the pain had ceased completely, but since the first attack there had been occasional sharp pains. On admission the tumor was smaller than when first observed.

**Examination.** The tumor is situated in the right upper abdominal quadrant. It can be moved around to some extent. It feels in contour very much like a prolapsed right kidney. It is firm on palpation. The patient gives an indefinite history of jaundice five weeks ago, otherwise we should have felt relatively certain that we were dealing with a kidney. The patient has not been able to work since her attack five weeks ago. She thinks she has lost in weight.

October 14, 1906. A careful cystoscopic examination showed perfectly normal urine and a normal bladder mucosa. On examination the blood showed a leucocytosis of 14,000, although the temperature and pulse on her admission were normal.

**Operation.** October 15, 1906. On opening through the right rectus, we encountered a thickened and adherent omentum. This was fast to the gall bladder, and the stomach and transverse colon were also firmly adherent to it. The gall bladder seemed to be exceedingly firm, and was encroaching upon the liver to some extent. It was necessary to free the gall bladder from the liver, but the connection be-

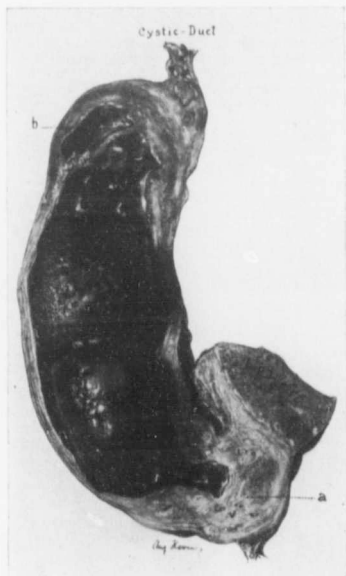


Fig. 6. Longitudinal section of the gall-bladder. For the outer appearance, see Fig. 4. The cystic duct is slightly thickened. The walls of the gall-bladder are increased in thickness, and at point *a* reach a thickness of fully 1.5 cm. It is here that the picture is so suggestive of a commencing malignant growth, that without microscopic examination it was impossible for us to say whether we were dealing with an inflammatory thickening or with a commencing cancer. Attached to the surface is a wedge of liver substance. The interior of the gall-bladder is much distended by two large and several smaller stones. There is a tendency toward partial partitioning off of the gall-bladder into smaller areas, as seen at *b*.

tween the two was so intimate that we decided to take a wedge 5 cm. in breadth out of the liver. (Fig. 7.) The raw areas in the liver were brought together by eight mattress sutures of catgut. The gall-bladder was now freed down to a point where the cystic duct was not much thickened. It was tied off on both sides, and the duct cut across with a cautery. After all bleeding had been checked, three iodoform-drains were carried down to the stump of the



Fig. 7. Complete removal of the gall-bladder, together with a wedge of the liver. The cystic duct is thickened. The gall-bladder is somewhat enlarged. Attached to it is a wedge of liver tissue, and at the upper portion we have a broad band of omental adhesions. For the appearance of the gall-bladder on section, see Fig. 9.

cystic duct and to the under surface of the liver. The bleeding was slight and was reduced to a minimum.

In this case we were somewhat suspicious, from the thickening of the gall-bladder, from the densely adherent omentum, and the intimate relation between the liver and the gall-bladder, that a malignant growth was commencing, and consequently decided that it would be much safer at once to remove a wedge from the liver.

The patient was returned from the operating-room in good condition, and spent the remainder of this day fairly comfortably; she vomited once. On the second day she vomited 540 c.c. The pulse was about 130; the temperature dropped from 101° to 99° in the evening. On



the second day there was considerable vomiting, and bile-stained fluid was present in large amounts on the dressings. This evidently came from the cut liver. Dressings changed on the second day were saturated. On the third day there was slight vomiting and the pulse was irregular. From this time on the patient made a very satisfactory recovery.

November 14, 1906. The patient's wound has healed, and she is to go home on the 17th.

*Description of Gall-bladder.* Gyn.-path. No. 10418. This specimen consists of the gall-bladder, a wedge of the liver, and of a densely adherent piece of omentum. The description and measurements are of the hardened specimen.

The gall-bladder itself is 9 cm. in length and is pyriform in shape (Fig. 7), varying from 1.3 to 5 cm. in diameter. The cystic duct is 8 mm. in diameter and considerably thickened. Intimately attached to the gall-bladder is a wedge of liver, 4 cm. in breadth and 4 cm. in length. This wedge of liver varies from 2 mm. to 2 cm. in thickness.

The omentum is snugly tucked down to the edge of the liver, and forms an almost integral part of the free surface of the gall-bladder for a distance of 5 cm.

On section, the gall-bladder wall is found to vary from 3 to 6 mm. in thickness. The inner surface presents a worm-eaten appearance, as if it were the wall of an abscess. At the fundus is a marked softening, the wall has given way over an area 1.2 cm. in diameter, and at this point the outer covering is only 1 mm. in

thickness. Here it is that the omentum is most densely adherent. (Fig. 9 a.)

The gall-bladder is filled with pus, and scattered throughout the cavity are many yellow-faceted gallstones, which average 5 mm. in diameter. The relationship between the gall-bladder and the wedge of liver removed is intimate. The connective tissue of the gall-bladder wall can be seen penetrating the liver. It would have been impossible to separate the gall-bladder from the liver without a great deal of tearing. The danger of infection would then have been infinitely greater.

Cover-slips from the pus show quantities of polymorphonuclear leucocytes with detritus, and here and there long and narrow bacilli. No culture was made, as we wished to harden the specimen before examining.

Sections from the gall-bladder show that in some places the lining epithelium consisting of high cylindrical cells is intact, and that the gland-like spaces, due to depressions, present a characteristic appearance. The stroma of the folds at such points shows small rounded infiltration, and here and there polymorphonuclear leucocytes. Polymorphonuclear leucocytes are also present between the individual epithelial cells, and the cavity of the gall-bladder contains desquamated epithelium, small round cells, leucocytes, and detritus. At other points the lining epithelium has entirely disappeared, and we have nothing but typical granulation tissue consisting of young connective-tissue cells, and capillaries, with here and there on the surface numerous polymorphonuclear leucocytes, and in the deeper portions cells that have taken up the brown pigment, evidently from hemorrhage. At one point in this

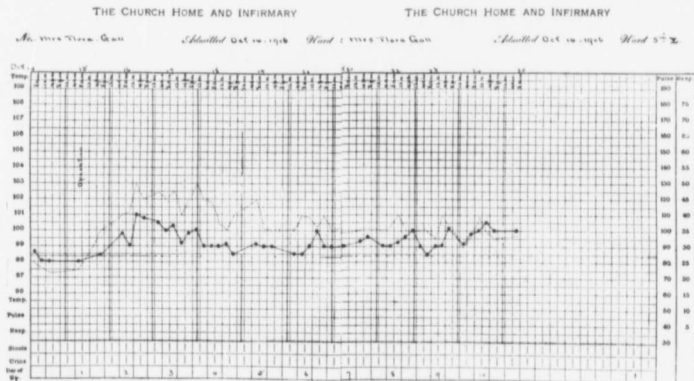


Fig. 8. As will be noted, at the time of operation the temperature was normal. On the next evening it rose to  $101^{\circ}$ , and then gradually dropped to normal, only once subsequently reaching  $100.5^{\circ}$ . The pulse at operation was normal. The next day it reached 130, and remained between 120 and 130 until the end of the third day, when it gradually dropped.

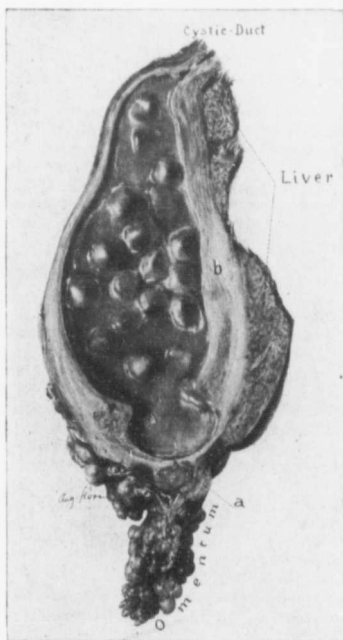


Fig. 9. Longitudinal section of a gall-bladder, showing adherent liver substance and a cavity filled with pus and gallstones. The cystic duct is considerably thickened. The gall-bladder is enlarged. Attached to its surface at two points are masses of liver substance. The walls of the gall-bladder are much thickened, especially at *b*. At *a* there is atrophy, and had it not been for the adherent omentum, rupture of the gall-bladder at this place might very readily have occurred. The gall-bladder is filled with pus, and scattered throughout this are biliary calculi. See Fig. 7 for the unopened gall-bladder.

granulation tissue we have a typical giant cell containing at least twenty-five or thirty small round vesicular nuclei, bunched chiefly in the center. There is, however, no suggestion of tuberculosis. The underlying stroma shows a good deal of small round-celled infiltration, and in the walls are abscesses. The inflammatory changes persist throughout the walls of the gall-bladder. The adherent omentum has to a great extent undergone fibrous change; in some places there is little more than old con-

nective tissue, with here and there foci with small round-celled infiltration. Clumps of fat globules—remnants of omental tissue—still persist throughout this fibrous tissue. The inflammatory thickening extends outward until it reaches the liver substance, and it is impossible to tell where this fibrous tissue stops and the capsule of the liver commences. The nuclei of the liver-cells vary considerably in size and in their staining qualities. We have a good deal of small round-celled infiltration and numerous eosinophiles. The eosinophiles are also abundant in the thickened wall of the gall-bladder.

*Diagnosis.* Acute and subacute cholecystitis, with large quantities of pus and gall-stones in the gall-bladder; implication of the adjoining liver tissue in the inflammatory process; dense omental adhesions undergoing fibrous change.

Removal of a wedge of liver substance with the gall-bladder certainly has a somewhat restricted field. Personally, in the majority of cases I would prefer to drain the gall-bladder merely, agreeing with those who consider the thorough drainage of the dammed-up bile as only secondary in importance to removal of the stones so frequently found.

In some cases it is impossible to remove the gall-bladder without tearing the liver to some extent, and in a limited number of cases one cannot exclude the possibility of carcinoma. In all such cases I think it just as well to be on the safe side, and to remove not only the gall-bladder, but also a wedge of the surrounding liver substance. We have found one disadvantage in the entire removal of the gall-bladder; that is, the sudden elevation—in some cases—of temperature after operation. In both of our cases there was, as will be seen from the charts, an elevation of temperature, but it gradually dropped to normal. In our case of resection of a portion of the liver for tumor, however, it will be noted that the temperature, which was over  $102^{\circ}$  at the time of operation, gradually dropped to normal.

#### SUTURE OF ACCIDENTAL TEARS OF THE LIVER

I have had two cases of this character. In the first there had been an abdominal abscess which had communicated with the liver, and in exploring the cavity I tore the liver substance. The bleeding was excessive, but was rapidly and completely controlled by four mattress sutures of catgut. In the second case, in removing an 89-pound subperitoneal, pedunculated myoma, a piece of liver substance was

found adherent to the upper surface of the tumor. I was particularly anxious to close the abdomen without drainage, and by passing Hagedorn needles backward the bleeding was at once checked by a few mattress sutures of catgut.

*Abscess between the abdominal peritoneum and omentum four weeks after labor; implication of the liver, the edge of the liver containing an abscess; secondary exploration in the region of the liver, with marked tearing of the friable organ; hemorrhage controlled with blunt liver-needles; complete recovery.*<sup>1</sup>

Gyn. No. 12456. A. M., seen in consultation, October 20, 1905, and at once admitted to the Johns Hopkins Hospital. She is 36 years of age, married, white. Her family and previous history are negative. She complains of a good deal of abdominal discomfort and of fever. The patient has been married seventeen years and has had ten children; the eldest is 14 years of age; the youngest was born September 10, 1905, just one month before her admission. Her labors have all been difficult and instrumental, and on several occasions there was tearing of the perineum. Four years ago the perineum was repaired at the Johns Hopkins Hospital. For several days prior to her labor in September, she had been in bed with a fever. Her delivery was instrumental, and was followed by a most profuse hemorrhage. Fever and chills continued for four days after delivery, and since that date she has had chills and fever, and marked pallor has been noted. On admission to the hospital, she was exceedingly anæmic, with the hæmoglobin 26 per cent, and the leucocytes 11,200. There were distinct hæmic murmurs, but the heart was normal. The lung sounds were also normal. The right eye was inflamed; a white scar was visible on the cornea, and a distinct purulent exudate was made out.

The abdomen was distended. Just to the left of the umbilicus, and extending outward, was an indurated area 2.5 cm. in diameter. This was somewhat pointed. The lower part of the abdomen was hard and suggested a large abdominal tumor. There was no reddening. There was more or less tenderness over the entire abdomen, especially over the small tumor or elevation in the left side. On pelvic examination, nothing could be detected. The cervix was high up, the uterus was freely movable, and the appendages were perfectly free.

*Operation.* October 21, 1905. An incision was made over the hardened indurated area on the left side. On opening the abdomen we encountered a large abscess containing foul-smelling pus. On careful exploration of the cavity I found that it continued upward almost

to the free margin of the ribs and downward to within 8 cm. of the pubes. It apparently lay between the anterior abdominal wall and the omentum. No intestines or abdominal contents were to be seen. The cavity was loosely packed with iodoform-gauze, and the patient left the table in a precarious condition. Cultures from the pus showed no organism, but anaërobic cultures were not made. After a few days, large quantities of pus were discharged. The temperature kept up; the patient became delirious, and had to be isolated.

On November 3, 1905, the hæmoglobin was 25 per cent, and the leucocytes were 15,200. On the following day the patient was brought down to the operating room, as her condition was not satisfactory. We could detect an area of induration along the free margin of the ribs on the right side. Artery-forceps were introduced into the opening, and carried out to where the induration had been detected on the right side. We then cut down upon the indurated area in the flank, an incision being made on the outer side of the rectus. The peritoneum was thickened, and there was much œdema in the peritoneal tissues. The liver was found lying just beneath the incision, and over a considerable area it appeared to be necrotic. It broke up very readily under the examining finger, and there was free hemorrhage. The insertion of three or four catgut sutures, however, with a blunt needle checked the oozing completely. We cut down on the edge of the liver and exposed a large pus-cavity.

Apparently the abdominal abscess had had its origin in the gall-bladder or had been a primary liver abscess, but in no way had implicated the pelvic organs, and had apparently been almost entirely anterior to the omentum. The patient gradually improved.

November 25, 1905. She was taken out of doors, although her condition was still precarious. From this time on her mental condition rapidly cleared up, and a decided improvement was noted each day.

She was discharged on December 21, 1905, with the abdominal wound completely healed. There was no tenderness at any point. The hæmoglobin was 76 per cent, and the mental condition was perfectly satisfactory.

In this case it was remarkable to see with what ease we could control the liver-oozing. It was only necessary to introduce a few catgut

<sup>1</sup>Abstract from the *Johns Hopkins Hospital Bulletin*, p. 153, 1906.

sutures through the friable material, and the bleeding was absolutely stopped. Had we used too much force, however, in tying, the sutures we would have undoubtedly cut through the liver tissue.

*Successful removal of an 80-pound cystic myoma intact (Fig. 10); piece of liver 3 cm. in diameter removed with tumor (Fig. 11); suture of liver; recovery.*

Mrs. McA., seen in consultation with Dr. Marshall Smith on June 25, 1926. She is 38 years of age. Twenty years ago she noticed a tumor in the lower abdomen, and was later seen in consultation by Dr. William T. Howard of the University of Maryland, who advised operation. The tumor gave her little inconvenience until three or four weeks before her admission to the Church Home and Infirmary, which she entered on July 27, 1926.

*Operation.* July 30, 1926. There was very marked abdominal distention. Prior to receiving the anesthetic the patient was thoroughly washed up, and all preparations were made for the operation, so that she might remain as short a time as possible under ether. It was impossible for her to lie down; consequently she was operated upon in the sitting posture. The growth was removed with a great deal of difficulty, as it was everywhere adherent to the anterior abdominal wall and to the omentum. We found large vessels going to the tumor from the omentum, also numerous vessels from the stomach and transverse colon, some of them reaching fully 7 or 8 mm. in diameter. The adhesions were gradually shelled off by my hand, but I had to use the utmost care and do all liberating under sight, as the rupture of one large vein might have caused the loss of the patient's life before the hemorrhage could be checked. The pedicle of the tumor was not more than 1.5 mm. in diameter, and was situated directly beneath the ribs.

On removal of the tumor I found that I had brought away a piece of liver substance 3 cm. in diameter. We had no liver-needles handy, so I used a sharp Hagedorn needle, running the eye through instead of the sharp end. This device answered admirably, and the bleeding was easily checked by four catgut sutures. The uterus and the right tube and ovary lay under the surface of the liver. The abdomen was closed without drainage, and the patient made a very satisfactory recovery. In this case, of



Fig. 10. An enormous abdominal enlargement, due to an 80-pound cystic myoma. Sketch of the patient on the operating table. The picture is taken from the right. The general thickness of the abdomen is clearly seen. The tumor projects downward, extending almost to the knees. It is readily seen why the incision was nearly four feet in length, because it extended from the sigmoid cartilage to the symphysis, the tumor being removed in its entirety.

course, the removal of this huge myoma, which, as far as we can learn, is the largest myoma successfully removed, was the most important feature, and the bringing away of the piece of liver a minor consideration. The bleeding in the liver was checked with the utmost ease, in fact much more rapidly than we are usually able to control bleeding from the uterus; and furthermore, it was checked so thoroughly that we did not deem it necessary to drain the abdomen.

Liver surgery is still a vaguely explored field, and will certainly in the near future engross much of the attention of the abdominal surgeon. We agree thoroughly with the *dictum* of Mikulicz, expressed in the terse sentence: "To my mind, Kousnietzoff's needle is the egg of Columbus in the technique of liver surgery," and with W. W. Keen when he says, "After my experience with these three cases, I should hardly hesitate to attack almost any hepatic tumor without regard to its size."

#### APPENDIX

While operating on my first case I accidentally discovered the secret of applying liver sutures. An assistant gave me a long, straight needle that had lost its point, and as we did not wish to delay, I used this, and was surprised to see the absolute lack of hemorrhage from the



Fig. 11. A small segment of the wall of the cystic myoma, showing a piece of liver attached to its surface.

The cyst walls in places reached 5 cm. in thickness. The pedicle of the tumor was very small. The tube and ovary were glued to each other by adhesions, and attached to them was a piece of liver substance which was so densely adherent to the appendages that it came away with the tumor.

needle-holes. Several weeks later, when going over the literature, I found an article by Kousnietzoff, and read the hearty commendation of his work by Mikulicz. Later, I had needles made. These, instead of being wedge-shaped on cross-section, as were those of Kousnietzoff, are almost flat, and further, they are much more slender, making a smaller hole in the liver substance. The modifications are, however, so slight that these needles are merely improved Kousnietzoff needles, and all the credit for introducing the needle that will push the vessels to one side or the other instead of piercing them belongs to Kousnietzoff.

I sent long and curved liver-needles to some of my friends in different parts of the country. From one of them, Dr. M. H. Everett of Lincoln, Nebraska, I have recently heard, and he has had the same satisfaction with this method of suturing the liver as we have had, the control of the hemorrhage being perfect.

# Parasitic Uterine Myomata.

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BALTIMORE.

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AMERICAN MEDICAL ASSOCIATION,  
ONE HUNDRED AND THREE DEARBORN AVENUE,  
CHICAGO.

## PARASITIC UTERINE MYOMATA.\*

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By this term we mean myomata that have for some reason become partially or almost completely weaned away from the uterus and receive their main blood supply from another source.

Uterine myomata, while primarily getting their entire nourishment from the uterus, may in time derive the greater part of it from: 1, The omentum; 2, large or small bowel; 3, bladder; 4, mesenteric vessels; 5, Fallopian tube; or from several sources at the same time. We are here chiefly interested in the rôle that the omentum plays where the myoma gradually changes its source of blood supply. The following pages will show beyond peradventure that the omentum is the guardian of the abdominal organs. In many cases where myomata exist the omental adhesions are associated with dense pelvic adhesions or with pus tubes. Here it is perfectly natural that the omentum should become firmly adherent. We are interested chiefly in that group of cases where the tubes and ovaries are comparatively normal and offer no particular incentive for the omental adhesions, and yet where for some reason the omentum manifests a certain affinity for the subperitoneal and usually pedunculated nodule, becomes adherent to it and soon furnishes a large part of its sustenance. Sometimes only a few vessels pass from the omentum to the myoma. As the pedicle of the tumor becomes smaller and its original source of nourishment diminishes, the omentum sends in more and more vessels. These vessels may spread out over the surface or divide into smaller

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\* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-eighth Annual Session, June, 1907.

branches and then enter the tumor, or they may plunge at once into the depth. As a rule, we have found large arteries each accompanied by two veins. The veins in some instances reach tremendous proportions. In one case, for example, some of them were more than 1 cm. in diameter and looked like small snakes.

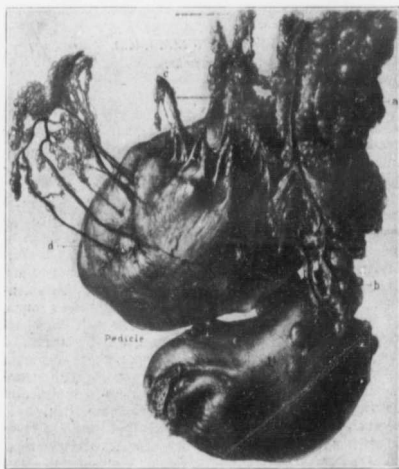


Fig. 1.—The gradual disappearance of omental fat when the omentum sends many vessels to a parasitic myoma (Path. 7925). The uterus is about twice natural size and contains several small myomata. Attached to its anterior surface by a short slender pedicle is a slightly-lobulated myoma and attached to the myoma over a wide area is omentum. At *a* the omental fat still presents the usual appearance. At *b* there is atrophy of the fat and the vessels stand out clearly. At *c* there is still further atrophy of the omentum, as only immediately around the vessels does the fat still persist. At *d* all semblance of fat has disappeared, and we see the omental vessels spreading out over the surface of the tumor or plunging directly into the depth.



## CHANGES IN THE OMENTUM.

The function of the omentum can be most beautifully followed in these cases. If the omentum be called on for a small blood supply a few vessels are at once sent in, and but little change is noted in the omentum, but where the tumor is large and much is required of the omentum then the vessels rapidly increase in size and the omental fat gradually disappears. The first change noted is that the vessels in the vicinity of the tumor stand out clearly and that the tissue between the vessels is becoming rarified (Fig. 1). Later the vessels near the tumor are merely supported by the peritoneal folds of the omentum. The fat continues to be absorbed until little or no trace of omentum remains, and the vessels are only recognized as omental on account of their relation to the transverse colon. This is strikingly well shown in one of our cases, where a small fringe of fat 1 cm. broad and lying against the transverse colon was all that remained of the omental adipose tissue (Fig. 3). The omental vessels seem to have an unlimited activity; for instance, in one of our cases where a very large myoma with a small pedicle existed, not only was there a liberal supply of omental nourishment to the upper surface of the tumor, but the omentum sent out a bunch of vessels into the lower pole of the tumor. These vessels formed a cord 6 cm. in diameter. The vessels were held together by peritoneum, but were free, the only fixed points being their points of origin at the transverse colon and their disappearance into the lower end of the tumor. At operation we lifted this cord up, completely encircling it with the hand. It looked just like a bunch of small snakes. One isolated omental vessel lay absolutely free for a distance of 18 cm. The function of the omentum is certainly marvelous, as was noted in one of our cases. Here the subperitoneal tumor weighed 89 pounds and was attached to the uterus by a very small pedicle, the chief nourishment coming from the omentum.

## DILATED LYMPHATICS IN THE OMENTUM.

Where large myomata exist dilated lymphatics are often found in the broad ligament. It is but natural that with the increased activity of the omentum its lymphatics also should be increased in size. In one of our cases we found marked dilatation in the broad ligament lymphatics, and coursing down from the omentum,

which was densely adherent to the pedunculated myoma, were markedly dilated and tortuous lymph channels. In another case the omentum, which was rapidly losing its fat, presenting here and there oval clear spaces where even the peritoneum had disappeared, a large tortuous lymph channel was clearly seen coursing down the omentum (Fig. 2).

CAUSES OF PARASITIC MYOMATA.

The cause seems inherent in myomata and not in the surrounding organs. The uterus is naturally trying to get rid of its interstitial nodules and they consequently become submucous and subperitoneal. If subperitoneal then with the continued uterine contraction they gradually become pedunculated and finally the mere weight of the nodule, making traction on the pedicle, will still further attenuate it. With the diminished blood supply these nodules are usually prone to degenerate, and often show hyaline degeneration or necrosis. The peritoneal surface evidently develops a slight roughening and the omentum at once becomes adherent.

If this reasoning be true, then we would naturally expect the part of the tumor farthest away from the pedicle to suffer first, and a reference to our cases has shown this to be true. The omentum appears to be fulfilling its normal useful function of guarding other abdominal organs from danger. If the omentum does not furnish the myoma with the necessary nourishment then the myoma will either develop an abscess in its interior and open into the intestine; for example, as in one of our cases, or it will call on the intestines or bladder for sustenance.

TECHNIC IN PRESENCE OF OMENTAL ADHESIONS.

Naturally the first thing to do after opening the abdomen will be to control the omental vessels. We always make it a point to tie off the omental vessels twice on the proximal and once on the distal or tumor side. These vessels are so delicate and tear so easily that we invariably tie instead of clamping and then tying. The mere weight of the artery forceps is at times sufficient to tear them and tremendous hemorrhage follows.

It is of the greatest importance always to tie under sight, consequently the incision must be sufficiently long to enable the operator to see all the vessels clearly.

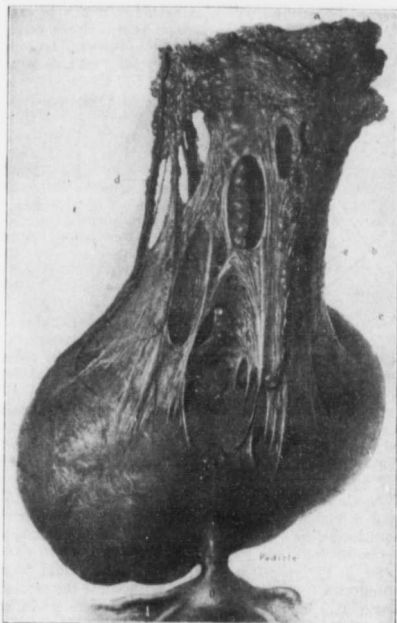


Fig. 2.—Parasitic myoma receiving a large blood supply from the omentum. Partial atrophy of the omental fat (Gyn. 1220).

The sketch was made immediately after operation. The uterus is normal in size. Attached to the fundus by a short slender pedicle is a myoma 19x14 cm. Covering the entire upper surface of the tumor are omental adhesions, and as seen from the pathologic report the greater part of the myoma had undergone hyaline and cystic degeneration.

The picture well depicts the gradual atrophy of the adipose tissue that follows when many omental vessels are furnished a tumor. At *a* normal omentum is seen, while at *b* the blood vessel has lost its adipose covering and stands out clearly. In the lower part of the omentum all trace of fat has disappeared, *c*, and nothing but the peritoneal layers of omentum and the vessels remain. At *d* the vessel is very clearly seen. At numerous points even the peritoneum is giving way, clear spaces resulting. In one of these a large tortuous vessel, *e*, filled with clear fluid, is seen. It is a markedly dilated lymph vessel.

Where the omental adhesions extend over a wide area we gradually lengthen the incision as it is found necessary, never attempting to liberate adhesions far out under the abdominal wall, as they may contain large veins or arteries.

In one case where the tumor weighed 89 pounds these precautions were carefully observed, and yet so intimately was the tumor everywhere attached that notwithstanding our care a small piece of liver came away with the tumor. With the careful and methodical tying of omental vessels even the largest tumors may often be removed with the loss of not over two ounces of blood.

#### ASCITIC FLUID ACCOMPANYING UTERINE MYOMATA.

Ascitic fluid is frequently associated with fibroma of the ovary, but rarely is there any appreciable amount with uterine myomata. We have had seven cases in which considerable ascitic fluid was detected at operation.

In Gyn. No. 9786, where the rounded myomatous tumor reached to within 5 cm. of the umbilicus, the abdomen contained 200 c.c. of free fluid. A glance at the history will show, however, that other factors were in all probability responsible for the ascites. The patient had a loud apical systolic murmur. There was marked edema of the feet and ankles, and the patient's hemoglobin, on her admission, was only 20 per cent., but reached 43 per cent. just before the operation.

In Case 6274 the uterus contained several subperitoneal myomata and was densely adherent. About three months before operation 1,550 c.c. of fluid had been aspirated from one pleural cavity. About eleven days prior to the operation 8,050 c.c. of ascitic fluid were withdrawn from the abdomen. In this case the cardiac lesion and the accompanying nephritis were probably responsible for the accumulation of ascitic fluid.

The presence of free fluid in the abdomen in five of our cases was undoubtedly due to the tumor and not to any constitutional impairment.

In Case 12155 a large pedunculated myoma had made a three-quarter turn on itself and the omentum was adherent over an area 14 cm. in extent. Some of its vessels entering the tumor were not 1 mm. in diameter. The abdomen in this case contained two ounces of clear yellow serum.

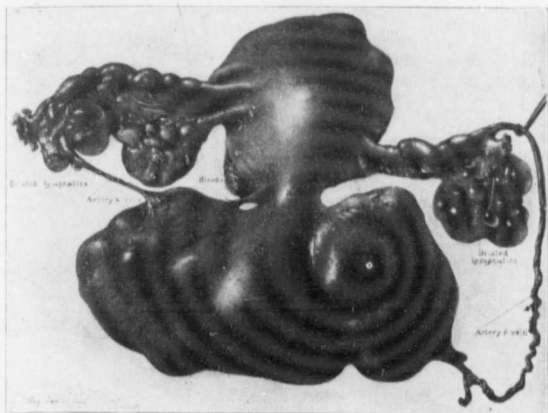


Fig. 4.—A partially parasitic myoma receiving part of its nourishment from the Fallopian tubes (Church Home and Infirmary No. 495).

The uterus contains several interstitial myomata. Attached to the posterior surface of the uterus by a short pedicle is a broad lobulated myoma. On the left side an artery and vein pass from the outer end of the tube to the anterior surface of the tumor. The branches of the artery spread out over the tumor. On the right side is what might be termed an unnecessarily long adventitious artery passing from the outer end of the tube to the posterior surface of the tumor, where it plunges into the depth. The accompanying vein clings like a vine to the artery, taking a very tortuous course. The fimbriated ends of both tubes are patent. The left ovary is normal. The right was not removed. The cystic spaces near the outer ends of both tubes seemed to be dilated lymph spaces. There was no evidence of pelvic peritonitis.

The further clinical history in such a case where operation is not undertaken would be of great interest. The pedicle would naturally become thinner and thinner until finally connection with the uterus would be severed. The tubal vessels would in the meantime, all have materially increased in size. With the entire weight of the tumor now on the arteries and veins any misstep or jolting might be sufficient to rupture one or both of the vessels and fatal hemorrhage would speedily ensue.

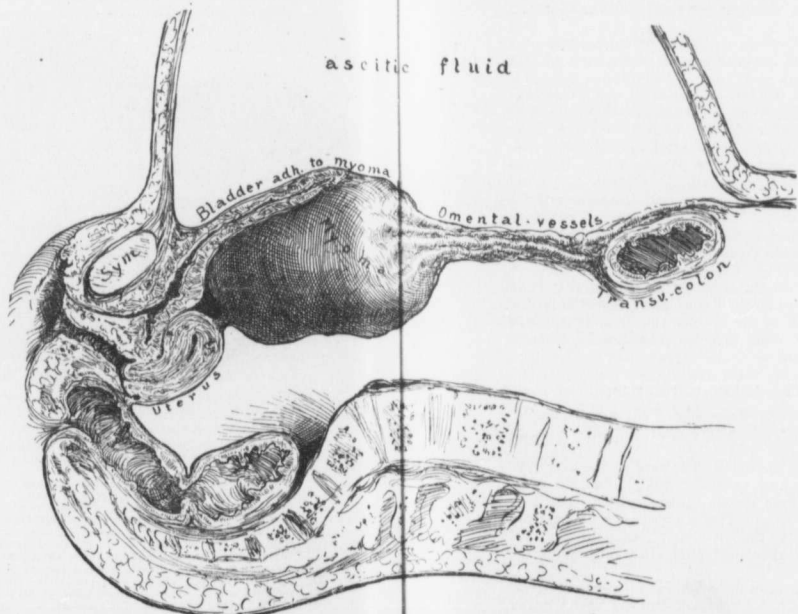


FIG. 3.—A partially parasitic uterine myoma associated with 70 liters of ascitic fluid. Attached to the fundus by a narrow pedicle is a subperitoneal myoma. Plunging into the edge of the myoma are the omental vessels. The omental fat has almost entirely disappeared. The myoma is intimately blended with the posterior surface of the bladder, from which it receives considerable nourishment. The abdomen is markedly distended with ascitic fluid. The small intestines were effectually held back by the tumor and the omental vessels.

In Case 6418 the subperitoneal myoma weighed 29 pounds, and the abdomen contained 500 c.c. of ascitic fluid.

In Case 3387, where a partially parasitic myoma existed, marked ascites was present, seven liters of free fluid being found.

In Gyn. 1383 one-half the omentum was densely adherent to the tumor and the abdomen contained 14,500 c.c. of straw-colored fluid and about 2,000 c.c. of clear jelly-like material that was scooped out with the hand. The urine contained albumin but no casts. With removal of the tumor the albumin disappeared.

Undoubtedly, one of the most remarkable cases of the intimate association of uterine myomata and extensive ascites is furnished by Case P., which I reported in detail in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* Nov. 19, 1904 (Fig. 3). In this case the subperitoneal myoma was almost completely weaned away from the uterus and received its chief blood supply from the posterior surface of the bladder and from tremendous omental vessels. The abdomen contained 51 liters of clear ascitic fluid.

#### CAUSES OF THE ASCITIC FLUID.

This fluid is clear, straw colored and usually limpid, but may coagulate, forming a clear, jelly-like mass, as has been noted.

As previously mentioned, fibromata of the ovary are usually accompanied by ascitic fluid. Here the large vessels in the loose pedicle become twisted, causing a transudation of serum. That the fibroma is undoubtedly responsible for the fluid is clearly proved by the total absence of free abdominal fluid after removal of the tumor.

In four of our cases the condition has been analogous. The myomata have been pedunculated and have received a large part of their blood supply from the omentum. Partial rotation of the tumor with twisting of the vessels has from time to time occurred and transudation of serum into the abdomen was the natural result.

On examination of the specimen from the case where 51 liters of ascitic fluid were present (Fig. 3), it will be noted that the myoma was attached by an exceedingly slender pedicle, and that a lateral movement of the patient was undoubtedly accompanied by partial twisting

of the tumor, shutting off the blood supply of the enormous omental vessels and favoring the pouring out of serum. It is now four and one-half years since the tumor was removed, and although the abdomen prior to operation contained 51 liters of fluid, there has never been a sign of ascites since then.

**A PARTIALLY PARASITIC MYOMA RECEIVING PART OF ITS BLOOD SUPPLY FROM THE FALLOPIAN TUBES.**

In this case the uterus was slightly enlarged and contained several small myomatous nodules. Projecting from the posterior surface was a broad lobulated subperitoneal myoma attached by a small pedicle. Passing into the anterior surface of the myoma was a small artery from the left tube and into the posterior surface of the tumor a large artery from the right tube. This artery was very long and lay perfectly free in the abdomen. Coiled around it was the accompanying vein, as is illustrated in Figure 4. There were no omental adhesions.

The fimbriated ends of both tubes were normal, hence it is at first glance difficult to explain how the tubal vessels ever reached the myoma. When the myoma formed an integral part of the uterus delicate adhesions have evidently formed between the outer ends of the tubes and the myoma, and as the myoma became more and more pedunculated the uterine blood supply diminished and the tubes gradually sent in vessels to the myoma through the tubal adhesions.

From a clinical standpoint the case is particularly interesting, because if the pedicle had become still more attenuated and had been finally severed then the myoma would have been entirely supported by the large tubal vessels, and any sudden jolting on the part of the patient might readily have caused a rupture of one of the adventitious vessels and fatal hemorrhage have followed.

**PARASITIC MYOMA AT PELVIC BRIM, RECEIVING BLOOD SUPPLY FROM SUPERIOR MESENTERIC VESSELS, PERITONEUM AND APPENDIX ADHESIONS.**

This is the only case in our series where the myoma was entirely separate from the uterus. It lay just above the pelvic brim and great care had to be exercised during its removal to avoid injury of the ureter and the neighboring vessels. The nourishment appeared to come from the arteries supplying the small bowel.



In this case the uterus was about three times the natural size, contained several myomata, and the appearance at operation indicated that the myoma originated in the uterus and had later engrafted itself on to the tissue at the pelvic brim.

ADVENTITIOUS INTESTINAL VESSELS NOURISHING UTERINE MYOMATA.

Uterine myomata, whether complicated with pathological lesions in the appendages or not, are prone to develop adhesions and naturally where adhesions exist the intestines may be implicated. As a rule, these adhesions consist chiefly of fibrous tissue, but should the uterine nourishment to the myoma diminish then arteries will occasionally be sent from the intestines to the myoma along the already existing adhesions.

In the accompanying group we depict only the most pronounced cases.

In Case 6324 a large pedunculated myoma sprang from the posterior surface of the uterus and attached to over half the anterior surface were dense intestinal adhesions containing many blood vessels. The intestines furnished a liberal blood supply to the myoma.

In Case 9027 a multinodular myomatous uterus received much nourishment from the omental vessels. The intestines were adherent to one of the tumors. These adhesions consisted almost entirely of blood vessels. The main tumor in this case weighed 29 pounds.

The multinodular myomatous uterus in Case 6774 was wedged in the pelvis and fixed by adhesions. The sigmoid flexure was densely adherent to the uterus and furnished the tumor with large adventitious vessels.

In Case 7226 the patient was in a precarious condition due to partial intestinal obstruction from the adherent multinodular myomatous uterus. One of the pedunculated myomata was becoming strangulated through torsion of the pedicle. On exposure the sigmoid flexure was found adherent to the tumor and sent numerous well-developed vessels to the myoma.

In some instances the relation between the pedunculated myoma and the intestine becomes an intimate one, so that the myoma undergoes degeneration with cavity formation. An opening may be established between the cavernous myoma and the intestine. Such a condition existed in Case 9078. The pedunculated myoma re-

ceived part of its nourishment from the omentum, part from the uterus and the remainder from the cecum. A direct communication existed between the interior of the degenerated myoma and the lumen of the cecum.

An even more advanced case somewhat similar in character came under the care of my friend, Dr. J. Mason Hundley, of the University of Maryland. The patient had been under the observation of another physician for over two years and a diagnosis of uterine myoma was made. At operation a uterus practically normal in size was found. It contained a small subperitoneal myoma. Filling the pelvis was a parasitic cystic myoma which received its entire nourishment from the small bowel. It had a broken-down cavity in its center. This communicated directly with the lumen of the gut, allowing the free passage of fecal matter from the bowel into the parasitic nodule. The myoma was attached to the uterus by a few slender adhesions. Such a condition as this is exceedingly rare, and yet the possibility of such a serious complication should not be overlooked.

#### ADVENTITIOUS BLADDER VESSELS NOURISHING UTERINE MYOMATA.

One of the first questions the surgeon asks before making an abdominal incision when a myomatous uterus exists is, Is the bladder high up? A knowledge of the dislocation of the bladder is of great importance to the surgeon, as he might otherwise open the bladder while making the abdominal incision. In our experience only five myomata derived any appreciable amount of nourishment from the bladder.

In Case 12194 a large multinodular uterus was present. The ovarian and uterine blood vessels were greatly distended. Rising from the anterior part of the uterus was a myoma with little or no uterine attachment. It apparently derived its blood supply from the tissue surrounding the bladder.

In Case 7739 a tumor filled almost the entire abdominal cavity. Much nourishment was furnished by the omentum, but a portion was contributed by very vascular adhesions from the bladder, anterior and left lateral abdominal walls.

The bladder in Case 3842 was so intimately attached to the tumor that a piece 1x6 cm. was excised with the

growth. In this case omental and intestinal adhesions also existed.

Probably the most extensive vesical blood supply to a myoma that one may encounter was noted in Case P. Here the bladder was drawn high up in the abdomen, and from its posterior surface many large and tortuous vessels passed to the tumor.

A reference to Case 5784 also showed a bladder supplying its quota of blood to the myomatous uterus. Here there were large tortuous vessels emerging from the pelvis and entering the tumor.

In Case 6915 the bladder also apparently supplied many vessels to the enlarged uterus.

MYOMATA EXTRUDED FROM THE UTERUS AND LYING FREE  
IN THE BROAD LIGAMENT.

In the foregoing pages we have described subperitoneal myomata that have become partially or completely separated from the uterus. Occasionally a myoma that has extruded into the broad ligament loses its connection with the uterus and receives a meager blood supply from the tissue in which it lies.

Gyn. 9674 was a very good example of such a condition. On opening the abdomen the uterus was found in retroposition. There were a few adhesions about the left appendages. Beneath the round ligament and in the broad ligament was a hard tumor the size of a small egg. It was slightly movable. The peritoneum was incised, the tumor shelled out and the hole left behind closed with catgut. The myoma in the broad ligament apparently had no connection with the ligament itself or with the uterus.

# Adenomyoma of the Uterus.

THOMAS S. CULLEN, M.B.  
BALTIMORE.

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## ADENOMYOMA OF THE UTERUS.\*

THOMAS S. CULLEN, M.D.  
BALTIMORE.

With the employment of the more exact clinical methods of examination and with the systematic study of all uteri removed at operation we have gradually gained an insight into the various diseases of the uterus.

Hemorrhage is one of the cardinal signs of carcinoma of the uterus, whether the disease be situated in the cervix or body. In the early stages of the disease an examination of a portion of the cervix or of scrapings from the body will as a rule enable the pathologist to say positively that a malignant growth is present.

Where uterine myomata exist hemorrhage may or may not be present, this phenomenon depending entirely on whether one or more of the myomata are partially or completely submucous.

Uterine hemorrhage also occurs where tubal pregnancy exists and is a frequent accompaniment of an acute tubal infection and is often noted where an ovarian cyst is present. In each of these cases the attending physician may gain a satisfactory clue as to the existing condition from the history.

Hemorrhage may be due to a constitutional tendency. Here also the family history will materially help the surgeon to make a satisfactory diagnosis.

In my experience there are three other conditions that are frequently responsible for uterine bleeding.<sup>1</sup> In the first group the patients are usually from 18 to 25 years of age. Much hemorrhage occurs at the menstrual period. On curettage the surface epithelium is found intact and the glands are normal, but there is a great increase in the stroma cells, and in their nuclei many

\* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

1. Uterine polyp are purposely omitted.

nuclear figures are found. In such cases curettage every three or four months for a period of several years is often necessary. The hemorrhage then usually ceases. I reported two such cases on page 479 of my book on Cancer of the Uterus.

In the second group of cases the patients have excessive menstrual bleeding and occasionally an intermenstrual flow. The histologic picture of the scrapings is characteristic, and I am at a loss to give the composite picture a name. The surface epithelium is intact, the glands are large and some of them are round and cystic, but the cystic change is not due to occlusion and pressure, as the epithelium instead of being atrophic is much thickened. The stroma is very rich in cell elements and the veins are often much dilated. In all cases where such conditions exist hemorrhage is present.

It is with the next group, namely, adenomyomata, that we are here chiefly interested. To the pathologist we are indebted for giving us the first clear and succinct account of this disease, and yet he can not aid the clinician in its diagnosis, as his examination of the uterine mucosa will yield nothing but perfectly normal mucous membrane.

In 1903 I<sup>2</sup> reviewed the literature on the subject in a supplement to Orth's Festschrift and reported twenty-two cases of adenomyoma examined by me up to that date. Since then I have paid especial attention to these growths and have been astonished at their remarkable frequency. In the examination of between 1,300 and 1,400 cases of myoma I have found seventy-three adenomyomata, in short in over 5 per cent. I have included only interstitial, subperitoneal and submucous adenomyomata and large adenomyomata of the uterine horns.

Glandular elements have from time to time been noted in myomata and, according to Breus,<sup>3</sup> Schroeder, Herr and Grosskopf were able to collect a total of 100 cases up to 1884. Not until the masterly work of von Recklinghausen<sup>4</sup> published in 1896 has this subject received much attention. These growths, as their name implies,

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2. Adeno-Myome des Uterus, Verlag von August Hirschwald, Berlin, 1903, 91 pages.

3. Ueber wahres Epithel Führende Cystenbildung in Uterus Myomen, Leipzig und Wien, 1894.

4. Die Adenomyome und Cystadenome der Uterus und Tubenwandung; ihre Abkunft von Resten des Wolff'schen Körpers, Berlin, 1896.

consist of gland elements and myomatous tissue. They form a distinct class of their own, and on microscopic examination their recognition is easy. Even in the gross specimen it is often possible to render a positive diagnosis. For the use of clinicians I have divided these growths into three classes, although it will be readily seen that one class may merge imperceptibly into the other. The divisions are: 1, Adenomyomata where the uterus preserves a relatively<sup>5</sup> normal contour; 2, subperitoneal or intraligamentary adenomyomata; 3, submucous adenomyomata.

ADENOMYOMATA IN WHICH THE UTERUS PRESERVES A RELATIVELY NORMAL CONTOUR.

The uterus may be normal in size or it may be found to be two or three times the natural size. Where the organ is considerably enlarged it is frequently partially covered by adhesions. In these uteri there is myomatous transformation of the muscle, the thickening extends from the mucosa outward and may involve half the thickness of the wall or reach even as far as the peritoneum. Sometimes it is limited to the anterior or posterior wall, but may involve both. Where such is the case we have a uterine cavity lined by a mucosa, which is surrounded by a thick zone of myomatous muscle covered externally by a mantle of normal muscle of variable thickness (Fig. 1). The myomatous thickening is diffuse in character, consists of bundles of muscle fibers running in all directions and along the advancing margins, gradually merging into the normal muscle in contrast-distinction to simple myomata which are sharply circumscribed. Given such thickenings of the uterine wall, we may always suspect the presence of gland elements.

On examining the uterine cavity it is usually found that the mucosa at one or more points extends into the diffuse myomatous tissue beneath. This is more readily discovered by examining with a loup, and on careful scrutiny of the diffuse myomatous growth small, round, irregularly triangular or oblong areas composed of a waxy, fairly homogeneous tissue are found lying between myomatous bundles. These areas correspond

5. I use the word "relatively" because if operative interference be long delayed some of the discrete myomata so frequently found may assume large proportions and almost completely overshadow the adenomyoma and likewise alter the contour of the uterus.

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closely in appearance with the uterine mucosa, and with the lens one can make out punctiform openings—cross sections of glands. Frequently such areas contain cyst-like spaces varying from 0.5 to 5 mm. or more in diameter. Other and larger cyst-like spaces are occasionally



Fig. 1.—Diffuse adenomyoma of the posterior wall of the uterus. Gyn. Path. No. 661. The uterus has been amputated through the cervix. The anterior uterine wall is unaltered. The posterior wall from cervix to fundus is greatly thickened, owing to the presence of a diffuse myomatous growth lying between the mucosa and the outer covering of normal muscle. This diffuse growth consists of fibers forming whirls, but also passing in all conceivable directions. It encroaches to a slight extent on the uterine cavity. At *b* we see the junction between the diffuse myoma and the normal muscle. The fibers of the one, however, blend imperceptibly with the other, and it would be impossible to shell this growth out, as can be done with discrete myomata. Near the internal os is a small polyp. The uterine cavity is somewhat lengthened. The mucosa lining the anterior wall is of the normal depth, but that covering the posterior wall is considerably thickened and at two points indicated by *b*, it can be traced for a considerable distance into the myoma. At *c*, just along the lower margin of the growth, the mucosa can be seen penetrating the uterine wall for fully 1.5 cm.



found. These have a smooth inner surface and a lining of mucosa often 1 mm. in thickness. They are in reality miniature uterine cavities. Many of these cyst-like spaces contain fresh blood or yellowish-brown pigment, the remains of old hemorrhages. Small cyst-like spaces may readily be mistaken for blood vessels, but the larger ones are easily recognized. Among the most instructive cases reported are those of Lockstaedt. In his Case 5 there was a diffuse myomatous thickening invading the posterior and part of the anterior wall. At several points the myoma had penetrated the outer muscular covering and had sent prolongations as far as the peritoneum. On section of the tumor a number of round lumina were seen. These had a diameter of 2 mm. In the fundus were six roundish depressions of the mucosa, into all of which one could easily pass a metallic sound, and in all it was possible to insert a bristle for a distance of 1 to 1.8 cm. ( $\frac{3}{8}$  to  $\frac{3}{4}$  in.) into the myomatous tissue. These canals branched with one another and also with the canals in the middle of the tumor. All were lined with a clear membrane, which was easily loosened from the underlying myomatous tissue. In short, the small canals in the myomatous tissue were channels from the uterine cavity and had a lining of uterine mucosa.

In his Case 7 Lockstaedt found a diffuse myomatous thickening of the posterior wall and of the right side of the uterus. Near the fundus he saw five roundish depressions of the mucosa and from these it was possible to pass into the myoma for a distance of 1.5 cm. ( $\frac{3}{4}$  in.). One of the canals was broad enough to be easily opened with the scissors, and here one could see the mucous membrane continuing directly out from the uterine cavity. Scattered throughout the diffuse growth were many cyst spaces, most of them filled with reddish-brown or chocolate-colored fluid. In order to determine whether these also communicated with the uterine cavity he introduced a solution of Berlin blue into all of them and was thus enabled to show that isolated cyst spaces were indirectly connected with the uterine cavity. From such cases as those of Lockstaedt we see that the uterine mucosa penetrates the diffuse myoma at several points and that these down-growths branch in all directions.

In Figure 2 we see just the earliest stage of such a

condition as Lockstaedt\* found. Here we find in the fundus coarse myomatous masses welling into the cavity and a large area of mucosa passing down into the crevice between. With the continued growth of the myoma a portion of the uterine cavity would soon be drawn into



Fig. 2.—Diffuse adenomyomatous thickening in the fundus and posterior uterine wall with extension en masse of the mucosa into a large crevice between myomatous masses. Gyn.Path. No. 788. The myoma is welling into the uterine cavity and into the space between myomatous masses a large area of mucosa is flowing. With the continued growth of the myomatous tissue this mucosa would in all probability be nipped off and carried outward, thus forming a large island of mucosa surrounded by myomatous tissue.

6. Ueber Vorkommen und Bedeutung von Drüsen-schlüchen in den Myomen des Uterus, Monatsch. f. Geb. und Gyn., 1898, vii, 188.

the depth and in all probability would eventually lose its continuity with the parent uterine cavity.

Rarely if ever do we find the slightest trace of glands in the outer covering of normal muscle. In the majority of these cases, besides the diffuse myomatous growth, a few circumscribed myomata are present. These are irregularly scattered, being submucous, interstitial or subperitoneal. They are usually several centimeters in diameter, but may reach 15 cm. (6 in.) or more before the uterus is removed. When the uterus is not enlarged the uterine cavity generally presents the usual appearance and is in no way altered, as the diffuse myoma does not usually press inward as a submucous myoma invariably does.

The uterine mucosa is usually smooth save for the occasional depressions as noted in Lockstaedt's case, is of the usual breadth or may reach a thickness of from 7 to 8 mm. Polypi, so common in cases of discrete myomata, are usually wanting.

#### HISTOLOGIC EXAMINATION.

The surface of the mucosa is usually smooth and has an intact epithelium. The glands present the normal appearance. The stroma of the mucosa just beneath the surface epithelium is often slightly edematous or rarefied. The diffuse thickening in the uterine walls consists of the characteristic myomatous tissue, but the muscle bundles show much more interlacing than is found in the ordinary discrete myomata, and then along the outer or advancing margin of the growth the myomatous cells gradually and imperceptibly merge into the normal muscle cells. The myomatous tissue, as was noted macroscopically, extends up to, but does not encroach on, the mucosa. In most cases the mucosa can be seen dipping down into the diffuse myomatous growth, and it will be noted that at such points the muscle bundles run at right angles to the mucosa, thus allowing the mucosa to dip down between them. Sometimes a single gland penetrates the myoma. Such a gland presents a perfectly normal appearance and is usually accompanied by the stroma of the mucosa which separates it from the muscle. In a favorable section such a gland can be traced far into the myomatous tissue. If it meets a barrier in the form of a muscle bundle running parallel to the uterine mucosa, instead of at right angles, it is

deflected along the surface of this until other muscular bundles are encountered that are again at right angles to the uterine cavity. It then passes still further outward between them.

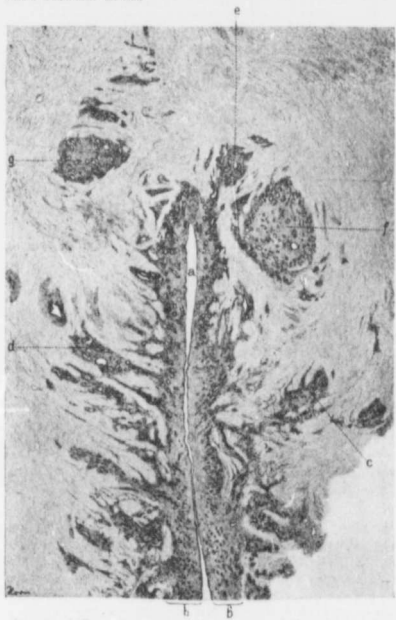


Fig. 3.—Diffuse adenomyoma in the body of the uterus. Gyn-Path. No. 9841. The section is from the upper part of the uterus. *a* indicates the uterine cavity and *b* and *b'* the normal thickness of the mucosa. The surface epithelium is intact, and the glands are of the normal appearance, but the mucosa is everywhere flowing into the underlying myomatous tissue, as is particularly well seen at *d*, *e* and *e'*. Sections at another level show that the apparently isolated islands *f* and *g* are also continuous with the mucosa lining the uterine cavity.

In other words, the gland follows the path of least resistance, winding in and out in all directions like a rivulet, but always penetrating toward the peritoneal surface. While single glands penetrate occasionally, larger portions of the mucosa, as a rule, find their way into the muscle (Fig. 3). These glands retain their normal appearance and, as has been noted, are invariably surrounded by normal stroma of the mucosa. These extensions of the normal mucosa can be traced by direct continuity for at least 1 cm. in many cases. In one of our cases they could be followed for over 1.5 cm. Of course, with the winding in and out of the down-growths of the mucosa the continuity will then be lost in the depths. Nevertheless serial sections and injections in favorable cases, as carried out by Lockstaedt, show that the bunches of glands found in the depths are direct extensions from the mucosa. In the outlying portions of the diffuse myoma round, oval triangular or irregular islands of glandular tissue are encountered. These consist, as a rule, of essentially normal uterine glands lined by one layer of cylindrical ciliated epithelium and surrounded by the normal stroma of the mucosa. Some of these glands become cystic, the dilation varying from 1 to 9 mm. or more in diameter. Such dilatations are easily explained by the kinking and bending to which the glands are subjected by the surrounding and ever growing myomatous tissue.

The epithelium of the dilated glands is usually pale staining and somewhat flattened. The cyst spaces frequently contain desquamated epithelium, sometimes are partially filled with blood pigment and also contain a varying quantity of blood. In several instances we have noted round giant cells containing from four to eight nuclei in their centers and probably originating from the coalescence of degenerated epithelial cells. Some of the large spaces are not dilated glands, but represent cross sections of the deep depressions from the mucosa as noted in Lockstaedt's cases. Here the entire mucosa is carried into the myoma, and on cross section we have a space lined by one layer of surface epithelium surrounded by typical uterine mucosa. Of course the mucosa on one side may be thinned out on account of the irregular stretching of the myomatous tissue and then we have a picture suggesting the "Hauptkanal" of von Recklinghausen. In one of my cases a miniature uterine

cavity was situated within 1 mm. of the peritoneal surface of the uterus.

From the pathologic description it is seen that the glands are naturally more abundant in the vicinity of the uterine mucosa, that they gradually diminish in number in the outer myomatous zone and are wanting in the normal outer muscular capsule. In short, where the myoma ends they cease. In some cases, although the glands in the diffuse myoma are identical with the uterine glands, their origin from the mucosa can not be clearly proven. In the majority of these cases very careful examination of serial sections will show that at some points at least the glands of the mucosa are continuous with those in the depth.

#### SUBPERITONEAL AND INTRALIGAMENTARY ADENOMYOMATA.

These are considered together inasmuch as the process is similar in both circumstances, namely, the extension to the outer surface of the uterus. If situated above the middle of the uterus the adenomyomata tend to become subperitoneal; below this point and lateral to the uterus they are likely to spread out between the folds of the broad ligament. Subperitoneal adenomyomata may be very small and completely isolated. I have examined subperitoneal nodules not over 1 cm. in diameter and have had others 13 by 10 by 8 cm. (5 by 4 by 3 in.). Where the nodule attains considerable size there is usually a large irregular cavity filled with chocolate-colored contents. The smaller ones also contain remnants of old blood.

On histologic examination the cyst walls are found to be composed of myomatous tissue. The cavities are lined by one layer of cylindrical ciliated epithelium, and in some places there is a moderate amount of underlying stroma separating the epithelium from the muscle. Neumann<sup>7</sup> in 1897 reported a case of a woman 44 years of age in whom he found an interstitial myoma the size of a fist and on the anterior surface of the uterus in the vicinity of the cervix a subserous myoma the size of a walnut. Lying in close proximity to this was a cyst as large as a hen's egg. This had a broad base. The walls of the cyst were composed of uterine muscle near the

7. Ueber einen neuen Fall von Adenomyom des Uterus und der Tuben mit gleichzeitiger Anwesenheit von Urnierenkeimen im Eierstock. Arch. f. Gynaek., 1899, Iviii, 593.

base having a thickness of 3 mm. but becoming thinner until at the convex and free surface they were not thicker than parchment. The inner surface of the cyst was smooth and the cavity contained a coagulated, friable, grayish mass.

In the vicinity of these cysts were two others the size of hazelnuts, with very thin walls. Situated in the tissue, at the base of these two, was still another cyst about as large as a bean. This was subdivided into several smaller cavities. The larger cyst had a wall composed of muscular tissue and was lined by a single layer of cylindrical ciliated epithelium. This rested on the connective tissue stroma which separated it from the muscle. Scattered throughout the myomatous muscle were glands bearing a marked resemblance to uterine glands and surrounded by stroma similar to that of the uterine mucosa. Neumann says that this was undoubtedly a large adenomyoma of the uterus, cystic in character. There was also an adeno-myomatous polyp in the uterine cavity and another adenomyoma in one of the uterine horns. He was unable to trace any connection between the uterine mucosa and the adenomyomata.

Probably one of the most remarkable subperitoneal adenomyomata of the uterus ever reported was the "voluminous" one of Pick,<sup>8</sup> which occurred in a woman 41 years old, sprang from the posterior surface of the uterus and was adherent to the anterior abdominal wall and to the intestinal loops. It consisted of many large blunt papillary masses, and in the vicinity of the median line the mass contained a glistening slimy cystic tumor about the size of a man's head. It was everywhere adherent. The cyst cavity contained clear muco-colloid material. On the surface of the growth were many isolated nodules consisting of myomatous tissue and containing large and small spaces. Pick found that the solid portions of the tumor consisted of a fibromyomatous substance surrounding a well-formed glandular tissue. This glandular tissue consisted of cylindrical glands lined by a single layer of cylindrical epithelium. Sometimes the glands occurred in groups were surrounded by a definite stroma. Others showed cystic dilatation. From the description it is seen that this tumor was a subperitoneal and adherent adenomyoma.

8. Ein neuer Typus des voluminösen paraoophoralen Adenomyoms. Arch. f. Gynaek. liv, 117.

## SUBMUCCOUS ADENOMYOMATA.

Submucous adenomyomata are certainly not very common. In one of my cases in which a myoma extended out into the broad ligament a large portion of it also projected into the uterine cavity. The growth at operation was thought to be a sarcoma, and consequently the entire organ was removed. Scattered throughout the submucous portion of the myoma were large and small cystic spaces filled with chocolate-colored contents and lined by a definite mucosa. Sections from some portions of these cavities showed mucosa that could not in any way be distinguished from normal uterine mucosa.

In Case 6855 there was a submucous nodule containing a few small uterine glands, and in Case 10872 a myoma containing three cystic spaces each 1 cm. in diameter and having a smooth lining, which consisted of one layer of columnar epithelium.

In Case 10314 we had a most beautiful example of a submucous myoma containing collapsed and dilated spaces lined by a definite mucosa. These were here and there filled with chocolate-colored contents, and on histologic examination they were found to be miniature uterine cavities.

In 1896, in a report of two cases of diffuse adenomyoma of the uterus,<sup>9</sup> I directed attention to cases of submucous adenomyomata reported by Diesterweg<sup>10</sup> and Schatz.<sup>11</sup> In Diesterweg's case a nodule the size of a hen's egg presented at the external os. Its surface was somewhat eroded, it was attached to a pedicle above the external os. The nodule was composed of myomatous tissue and in the center was a large cavity lined by mucosa and traversed by numerous small depressions producing an appearance suggestive of a ventricle. There was a similar cavity the size of a cherry. These cysts were lined by cylindrical ciliated epithelium and filled with brownish-black blood. Two years later, after the administration of ergotin, a submucous myoma measuring 9 by 7 by 6 cm. ( $3\frac{1}{2}$  by  $2\frac{3}{4}$  by  $2\frac{3}{8}$  in.) was expelled. This contained a cyst the size of a walnut.

9. Adeno-myoma Uteri diffusum benignum, Johns Hopkins Hospital Reports, 1896, vl.

10. Ein Fall von Cystofibroma uteri verum, Ztschr. f. Geb. u. Gyn., 1888, ix, 191.

11. Ein Fall von Fibro-adenome cysticum diffusum et polyosum corporis et colli uteri. Arch. f. Gyn., 1884, xxii, 456.



The cyst was lined by cylindrical ciliated epithelium and filled with blood.

In Schatz's case the uterus was 16 cm. ( $6\frac{1}{4}$  in.) long, 8.5 cm. ( $3\frac{1}{4}$  in.) in diameter. Its walls varied from 2 to 2.5 cm. ( $\frac{3}{4}$  to 1 in.) in thickness. The uterine cavity contained five rows of broad-based polypi, each row consisting of from two to sixteen polypi. Between the rows were deep depressions. The polypi pointed toward the internal os and varied from a pea to a hen's egg in size. The uterine cavity was filled with them. On section the polypi were found to have a rich blood supply and in several places bundles of muscle fibers could be seen extending into them and reaching almost to the free surface. Where the muscular elements predominated the polypi were firm. Scattered throughout the uterine wall were small myomata, which were not easily shelled out. In the myomata near the peritoneal surface no cysts were to be seen, but in those near the uterine cavity and also in the muscle they were present. The outer portions of the uterine wall were entirely free from cysts. The polypi consisted of spindle-shaped cells, and scattered throughout them were gland-like cavities lined by high cylindrical epithelium. It would appear that in these cases there had been a diffuse adenomyoma and that the uterus was trying to free itself of the new growth in the same manner, in which it extruded ordinary myomata. Accordingly, the polypoid condition had naturally resulted.

Remembering the diffuse adenomyomata of the uterus and subsequent extension of the growth to the outer surfaces with the formation of subperitoneal or intra-ligamentary cystic adenomyomata, it is easily understood that portions of the growth, at least, are forced inward and become submucous. In the submucous polyp we do not generally expect much cystic dilatation of the glands, since the growth is continually subjected to the uterine pressure on all sides.

#### CERVICAL ADENOMYOMATA.

From the study of adenomyomata of the body of the uterus we have seen that, in the first place, there is diffuse myomatous thickening of the inner muscular walls accompanied by a down-growth of the normal mucosa into this diffuse growth. Portions of this adenomyoma may become subperitoneal or intra-ligamentary and may form a large cystic adenomyoma. Portions of the diffuse

growth were also found to project into the uterine cavity, forming submucous adenomyomata. Should an adenomyoma develop in the cervix we would expect it, judging from analogy, to consist of cervical glands enclosed in a tissue made up of myomatous muscle and the dense stroma characteristic of the cervical stroma. In Case 3898 there was found a small myomatous uterus, in which remnants of an adenomyoma were present along the outer border of the cervix, that is, near the broad ligament or vaginal attachment. The glands in this small growth correspond to those of the body of the uterus and, in addition, they are surrounded by the usual stroma found in the mucosa above the internal os. Landau and Pick<sup>12</sup> reported a case in which the cervical canal was entirely obliterated by an adenomyomatous nodule which completely shut off the uterine cavity from the vagina. In this case also typical uterine glands with their accompanying stroma were the epithelial elements present.

In 1896, when reporting two typical cases of diffuse adenomyoma of the body of the uterus,<sup>13</sup> I described an adenomyoma of the cervix consisting of cervical glands, muscle and a moderate amount of fibrous tissue. This finding is very rare, as from the literature we have been unable to glean a single similar case. In this case a round submucous nodule 2.5 cm. (1 in.) in diameter projected from the cervix.

On histologic examination the outer surface of the nodule is found to be in places covered by cylindrical epithelium. Scattered everywhere throughout the muscle are gland-like spaces varying from a pinhead to 3 mm. in diameter. These are lined by a single layer of epithelium, which in the smaller glands is of the high cylindrical variety. In the dilated glands, however, it is cuboidal or has become almost flat. The cell protoplasm takes the hematoxylin stain, as is so characteristic of the cervical epithelium. The nuclei are oval and vesicular and in many places it is possible to make out cilia. The gland cavities are empty or contain granular material that takes the hematoxylin stain. The glands tally in every particular with the cervical glands. This

12. Ueber die mesonephrische Atresie der Müller'schen Gänge, zugleich ein Beitrag zur Lehre von den mesonephrischen Adenomyomen des Weibes und zur Klinik der Gynastresen, Arch. f. Gynæk., 1901, lxiv, 98.

13. Adenomyoma Uteri Diffusum Benignum, Johns Hopkins Hospital Reports, 1896, xi.

nodule is undoubtedly a cervical myoma and appears to be the only one of its character on record. It has evidently started near the internal os. Otherwise we would not have had so much muscular tissue.

#### ADENOMYOMA IN ONE HORN OF A BICORNATE UTERUS.

It is rather interesting to find one horn of a bicornate uterus the seat of an adenomyoma. Whether the opposite horn was likewise involved I can not say, as the uterus was not removed. From a clinical standpoint it is also instructive, as in this case there was absolutely no connection between the vagina and the uterine cavity, there being practically no cervix. The condition in this case absolutely excluded the possibility of pregnancy having had any causal relation to the development of the adenomyoma.

#### HYPERTROPHY OF THE CERVIX AND DIFFUSE ADENOMYOMA OF THE BODY OF THE UTERUS.

In the examination of thousands of specimens this is the most unusual one which I have ever seen. There is such a marked increase in the size of the cervix due to simple hypertrophy, while the fundus has kept pace by the development of an adenomyoma. We accordingly have a uterus which, although greatly enlarged, still has retained its relatively normal proportions.

#### CONDITION OF THE TUBES AND OVARIES WHERE ADENOMYOMA OF THE UTERUS EXISTS.

In forty-five careful examinations of the tubes and ovaries to find a causal relation between them and the development of adenomyoma in the uterus, I have failed to find any proofs of such relation. In fifteen cases I found the appendages on both sides normal. In the remaining thirty cases the appendages on one or both sides were covered by adhesions, there being a mild degree of pelvic peritonitis, in part probably due to the discrete myomatous growth, but to a greater extent undoubtedly caused by the diffuse myoma. In these cases the uterus showed a peculiar tendency to become adherent to adjoining structures.

Where pelvic adhesions are present the normal maturing of the follicle is often interfered with, and we consequently find small Graafian follicle or corpus luteum cysts. These pathologic changes in the ovaries are not

in excess of those usually found in a corresponding number of abnormal adnexa examined in the laboratory. Adenomyoma of the uterus does not seem to increase materially the pathologic changes in either the tubes or ovaries.

In forty-nine cases where I examined the uterus for adhesions twenty-five were perfectly smooth and twenty-four were more or less adherent. The adhesions were, as a rule, confined to the posterior surface of the organ, rarely was the anterior surface involved.

#### THE CLINICAL PICTURE IN CASE OF ADENOMYOMA OF THE UTERUS.

This will, of course, depend on the situation of the growth, also on the size and situation of the discrete myomata so often associated with adenomyoma. Where the diffuse growth is the chief factor the patient usually gives a history of lengthened menstrual periods accompanied by a great deal of pain, sometimes limited to the uterus but often also referable to the back and extending to the legs. This pain may be dull, aching or grinding in character. As the disease progresses the menorrhagia may be replaced by a continuous hemorrhagic discharge, as was observed in several cases, or alarming bleeding may occur. This hemorrhage is readily accounted for when we take into consideration the greatly increased amount of uterine mucosa existing under such circumstances, comprising that lining the uterine cavity and also that liberally distributed throughout the diffuse myomatous growth. The pain is also easily explained when we remember that the myomatous tissue is treated as a foreign body.

In some cases of discrete myomata there is also pain, but the uterus readily forces the nodule toward the peritoneal or submucous surface. In the diffuse growth while this is also possible, the difficulties in its accomplishment are much greater, as the mass is so intimately interwoven with the normal muscle. At each menstrual period the uterine mucosa is congested and thickened. In adenomyoma with an increased amount of blood in the islands of the mucosa scattered through the diffuse growth we should naturally have increased tension, producing a tenderness or sharp pain in the uterus.

In analyzing the clinical histories of thirty-seven cases for uterine discharge we find that twenty-six were free from any flow between menstrual periods or between

hemorrhages. In eleven there was a distinct flow, chiefly leucorrhœal in character and usually non-irritating. In a few instances it was greenish or yellowish in color and offensive. In Case 3192 there was a frequent white discharge, and in Case 1944 a watery discharge was present. This might readily be accounted for, as the patient had a hemoglobin estimate of only 40 per cent. One is naturally surprised to see that so few of the patients gave a distinct history of vaginal discharge. When we remember, however, that the uterine mucosa and that situated deep down in the muscle is practically normal, this relative absence of the vaginal discharge is readily explained. In those cases in which the adenomyoma becomes subperitoneal or intra-ligamentary and forms large cysts pressure symptoms may occur, and such cysts are usually firmly fixed in the pelvis. This is especially true in the intra-ligamentary variety, where the tumor is prevented from arising into the abdomen by the broad ligament.

#### AGE.

I have found this disease in women as young as 19 and as old as 60. In sixty-six patients in whose cases the age was obtained the following result was noted:

One was 19.

Three were between 20 and 30.

Twenty-one were between 30 and 40.

Nineteen were between 40 and 50.

Twenty one were between 50 and 60.

One was 60.

Showing that the period between the ages of 30 and 60 is the most frequent for this disease. The process seems to be a slow one, as is evidenced by the clinical history. Some patients date their trouble back five to ten years, while others have been complaining for only a few months. I have found this disease equally prevalent in the colored and white race.

#### RELATION TO PREGNANCY.

I have examined the clinical histories in forty-nine of the cases to determine the relative frequency of pregnancy, with the following results:

Nine were single.

Six were sterile.

Two had had miscarriages.

Thirty-two had had children.

One of the sterile patients had not married until over 40 years of age and might accordingly be equally well classed with the single patients from that standpoint. In thirty-one of the thirty-four patients that had had either children or miscarriages I have accurate records of the number of children. In all 141 children were born, approximately four children to each woman. In a few instances a woman had but one child, while in one case the patient was the mother of thirteen, in another of eleven, in a third case of ten. These figures show that the disease is found in the single as well as in the married women and, furthermore, that it does not seem to in any way militate against normal pregnancy.

#### PHYSICAL EXAMINATION.

On making a vaginal examination, where the growth is confined to the uterus, we find the cervix practically normal, the body of the uterus considerably enlarged and very hard. In the majority of cases we also feel definite small round bosses due to discrete myomata. In the early cases the organ may be free, but very often it is enveloped in adhesions and firmly fixed. In some cases the organ will be symmetrical and the size of that of a two or three months' pregnancy and very firm. Where the growth is large and cystic and lies in the abdominal cavity it is impossible to differentiate it from an ordinary myomatous uterus pure and simple or associated with an ovarian cyst. If the growth be intra-ligamentary it is more firmly fixed in the pelvis and is then comparable to a broad ligament myoma or to an intra-ligamentary cyst, although it may simulate a large pelvic abscess. The clinical history of pus will, however, be wanting.

From the foregoing it will be seen that the diagnosis of adenomyoma of the uterus is difficult. If we are dealing with a diffuse form the frequent and ever-increasing hemorrhages associated with a hard, slightly enlarged uterus containing a few small discrete myomata and yielding on curettage normal, although moderately thickened, mucosa, we may reasonably suspect an adenomyoma, although the hemorrhages may be due entirely to the discrete myoma. Where carcinoma of the body of the uterus is present the organ is likely to be somewhat soft; it rarely has small and isolated myomata on

its surface, and yields adeno-carcinoma instead of normal mucosa on curettage. Where the growth is subperitoneal or intra-ligamentary the diagnosis is impossible until the abdomen is opened, but then given a myomatous uterus containing large cystic areas with smooth velvety linings and chocolate-colored contents adenomyoma will usually be found.

#### TREATMENT OF ADENOMYOMATA OF THE UTERUS.

In the majority of these the case will be looked on as one of simple myoma and its true character only determined after operation. Should a diagnosis be made, abdominal hysterectomy is indicated. Myomec-tomy is inapplicable, as the growth is so interwoven with the normal muscle that it can not be shelled out. In cases of intra-ligamentary and cystic adenomyomata, evacuation of the cyst contents will often be found necessary before it is possible to shell the tumor and the uterus out from the pelvic floor. As these growths will lift up the peritoneum of Douglas' sac, it will be advisable to dissect the peritoneum back so that it can be replaced after removal of the tumor, thus avoiding a raw area on the pelvic floor. If this precaution be not taken, intestinal loops are apt to drop down and become adherent.

#### THE BENIGN CHARACTER OF ADENOMYOMA OF THE UTERUS.

When considering these growths in 1896, I agreed with von Recklinghausen that they are benign. The glands are perfectly normal uterine glands and are surrounded by the normal stroma of the mucosa. They are confined entirely to the new growth and do not show the slightest tendency to invade the normal muscle. Wherever possible, it is always well to back up the impressions gained from histologic study by the clinical outcome. And in two of my cases this has been unconsciously and yet admirably done. In Case 3600 (Fig. 4), on opening the abdomen, a diffuse myomatous thickening was found in the posterior uterine wall. It was considered to be only a myomatous thickening and a wedge-shaped piece of the growth was removed; in other words, a partial myomec-tomy was performed.

The histologic picture showed the growth to be adenomyoma of the uterus. The patient remained perfectly

well for years. A similar wedge was removed in Case 4415. The patient also remained perfectly well.

SQUAMOUS CELL CARCINOMA OF THE CERVIX AND ADENOMYOMA OF THE BODY.

In a previous communication<sup>2</sup> I reported one case of squamous-cell carcinoma of the cervix associated with diffuse adenomyoma of the body of the uterus. Since then I have examined five similar cases. The simultaneous occurrence of both these processes in six cases in the records of one laboratory certainly indicates that the coexistence of these two diseases is no rarity. When we see what a large number of adenomyomata have

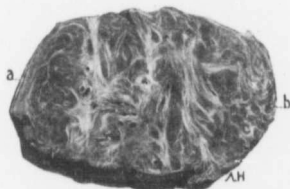


Fig. 4.—A portion of a diffuse adenomyoma in the posterior wall of the uterus. Gyn. Path. 777. At operation the posterior uterine wall was found much thickened. A wedge was cut out and the surfaces brought together as in an ordinary myomectomy. *a* is the peritoneal surface, just beneath which is a zone of normal muscle. The growth presents the typical appearance of diffuse myoma. Along the outer margin it gradually merges into normal muscle. *b* corresponds to the point nearest the uterine cavity. The uterine cavity posteriorly was not opened. Scattered throughout the myoma are small round, oval or oblong spaces. Some are dilated glands, others cross sections of small blood vessels. At the time the operation was performed we were not familiar with these adenomyomatous growths.

been detected where the uteri are carefully and systematically examined, and knowing how widespread squamous-cell carcinoma of the cervix is, it is little wonder that these two processes are frequently found in the same uterus. The symptoms of the carcinoma of the cervix would naturally completely overshadow those of the adenomyoma. Consequently the marked extension of the uterine glands into the depth would not be suspected until after removal of the uterus.



ADENOCARCINOMA OF THE BODY OF THE UTERUS  
DEVELOPING FROM AN ADENOMYOMA.

From the consideration of adenomyomata of the uterus, it is seen that the gland elements are practically normal uterine glands, both in their histologic and physiologic peculiarities. From normal uterine mucosa we often have developing an adenocarcinoma. Consequently we should not be surprised if an adenocarcinoma were sometimes detected in an adenomyoma. Von Recklinghausen, in his entire series of adenomyomata, found only two cases where he thought there was a carcinomatous change. Meyer also had a suspicious case, but from his description I would hardly venture a positive diagnosis of malignancy. In Case 4656, where carcinoma of the body of the uterus was present, I noted several dark areas deep in the muscle and surrounded by definite zones of stroma. They consisted of typical islands of uterine glands surrounded by the stroma of the mucosa. Some of the glands were dilated, forming cyst-like cavities. In one of these cavities lined by a single layer of cylindrical epithelium and separated from the muscle by a definite stroma, the epithelium had proliferated, forming new glands and papillary outgrowths consisting almost entirely of solid masses of cancer cells. This case is undoubtedly one of adenocarcinoma developing in part from a cystic gland situated in the adenomyoma.

In Case 1852 I also found a similar condition. The body of the uterus was the seat of a typical adenocarcinoma and deep in the muscle areas of adenomyoma were found. At one point the carcinoma was seen developing from one of the glands in the adenomyoma. In this case the histologic picture also strongly suggested the independent development of sarcoma of the body.

## ORIGIN OF ADENOMYOMATA OF THE UTERUS.

In 1896 von Recklinghausen reviewed the literature of adenomyomata and added many new cases. After a careful consideration of all, he concluded that in the vast majority of instances the glandular elements were derivatives of the Wolffian duct. This opinion was based on the supposed close analogy between the elements of the Wolffian duct and the glandular structures present in adenomyomata of the uterus. In only one case was he certain that the glands were due to down-

growths of the uterine mucosa. This case of von Recklinghausen's was included in the appendix to his most instructive treatise. Since his publication appeared, widespread attention has been directed to this subject and quite a number of new cases have been reported. Many writers have espoused von Recklinghausen's theory, but not a few have claimed that nearly all, if not all, of these cases owe their origin to the uterine mucosa or to a portion of Müller's duct. It would be unnecessary for me to review at length this lively controversy, but to those wishing the full details I would recommend the careful presentation of the subject as given by von Recklinghausen, Meyer, Pick and Kossman.

In my previous publication,<sup>2</sup> I reported 19 cases of diffuse adenomyoma and pointed out that in the majority of these cases the process was still limited to the uterus, thus enabling us to determine definitely the origin of the glands in most of the cases. Since then I have subjected each myomatous uterus to the most careful scrutiny, and wherever adenomyoma was suspected I have had very large sections made from many parts of the uterine cavity. If adenomyoma was present and no connection between the glands in the depth and the uterine mucosa could be detected, then I kept on cutting more tissue until finally in the vast majority of the cases I found that the gland elements were derivatives of the uterine mucosa. I have been greatly helped in this work by Mr. Benjamin O. McCleary, my laboratory assistant.

I have examined fifty uncomplicated cases of diffuse adenomyoma of the uterus, some very extensive, others in their early stages. In every one of these cases I have been able by persistent search to trace the uterine mucosa into the myomatous tissue. In other words, islands of mucosa in the diffuse myomata originated from the mucosa lining the uterine cavity in every case. The reader can verify this statement for himself by scanning the pathologic description of the cases which will later be reported in detail.

In six other cases there was squamous-cell carcinoma of the cervix and diffuse adenomyoma of the body. In five of the six cases the origin of the gland elements in the myoma could be traced to the mucosa. In the remaining case (Gyn. 9971), where the process was a

rather indefinite one, it was impossible to show the origin of the glands from the mucosa.

We thus see that in 55 out of 56 cases of diffuse adenomyoma of the body of the uterus the gland elements were, in part at least, derivatives of the uterine mucosa.

#### SUBPERITONEAL ADENOMYOMATA.

In eight cases I have found subperitoneal adenomyomata. In Case 4838 there was a large subperitoneal adenomyoma, and examination of the uterine mucosa showed that the glands extended 1.5 mm. into the muscle. Of course, no continuity with the subperitoneal nodule could be traced. In Case 3293 subperitoneal cysts of an adenomyomatous type were found, but in this case the uterine mucosa was normal. In Case 1872 where the most typical adenomyoma lay perfectly free from the uterus, being attached to the utero-ovarian ligament, the uterine mucosa extended into the muscle and the uterus was also the seat of discrete myomatous nodules. In Case 5782 the adenomyomatous nodule was small and the uterine mucosa was completely destroyed by the adenocarcinoma. In the remaining case of subperitoneal adenomyoma only the nodule was removed and we have had no chance to examine the uterine mucosa to determine if any continuity with the adenomyoma persisted.

#### SUBMUCOUS ADENOMYOMATA.

I have had seven cases of submucous adenomyomata. Some consisted of diffuse myomatous growths containing only a few small glands. In others the glands became cystic, while in one case the myoma was riddled with miniature uterine cavities. In this case the direct continuity with the uterine mucosa was readily established. Where the uterine glands are seen penetrating the myomatous muscle there is no question as to their being derivatives of the uterine mucosa, and, as will be seen from a study of these cases, in the majority of which the uterus was removed the mucous membrane origin was established. This fact is very significant when compared with the figures of those claiming the Wolffian duct origin. With the increase in thickness and the irregular growth of the diffuse myoma, it is very natural that the continuity of the uterine glands into the depth

is after a time lost, as is evidenced by the formation of cysts.

It is not necessary that the uterine glands be traced by continuity to establish the mucous membrane origin. The islands of glands lying deep down in the myomatous muscle correspond identically with those seen in cases in which the continuity is traceable and also, moreover, they are precisely the same as in normal uterine mucosa. Furthermore, they are surrounded by a stroma identical with that surrounding the uterine glands. In some cases miniature uterine cavities are scattered throughout the myoma. From the uterine mucosa there is a periodic hemorrhage every month.

According to Hartz, Sanger, when speaking to his students of the uterine mucosa, said: "This is no simple mucous membrane, but it is an organ which has an important function to fulfill." With Sanger's view I am in thorough accord. In no other part of the body do we find a mucosa with a similar function and nowhere do we meet with such histologic peculiarities. Now, if portions of this uterine mucosa be far removed from the parent mucosa, we should still expect them to retain their function, and this they do. In nearly every instance in which cyst spaces are present the cavities are, in part or almost, completely filled with blood; and even in the small and undilated glands blood is frequently present, or the epithelial cells contain blood pigment, the remnants of old hemorrhages.

It is natural that the cysts in the uterine walls should remain small, as they are compressed by the muscle; on the other hand, when they have once become subperitoneal they may dilate until they contain several liters (quarts) of blood, although even in these cases they still show the evidence of the menstrual phenomenon as seen in their chocolate-colored contents. In the solid portions of these growths, islands of typical uterine mucosa are still demonstrable. It is so easy to understand how interstitial myomata become subperitoneal or submucous, and yet in considering the subsequent history of adenomyomata the majority of authors have forgotten to apply the same principle.

When the growth becomes subperitoneal we should expect its glandular elements to gradually lose their continuity with those of the mucosa, and such is the case. Hence the confusion as to their origin. Case 2 of

Breus<sup>14</sup> illustrates very well the intra-ligamentary variety. In Kronig's<sup>15</sup> case we have all the elements of normal uterine mucosa and also large cysts. In Breus' case we find the same, but fortunately the communication between the uterine mucosa and the cystic tumor still persists, showing beyond a doubt that the gland elements in this case were from the uterine mucosa.

A definite example of a portion of a diffuse adenomyoma becoming subperitoneal is furnished by Lockstaedt.<sup>6</sup> The adenomyoma occupied the posterior wall and right side, and in the gross specimen it was possible, in at least five places, to see the mucosa extending deeply into the myoma. In this case there was a subperitoneal adenomyoma the size of a cherry that by its pedicle was in direct communication with the diffuse growth so that its glands were undoubtedly derivatives of those of the uterine mucosa.

Were we in need of still further proof that these islands of mucosa are identical with normal uterine mucosa, the case reported by Williams would certainly tend to convince the most skeptical. In examining the uterus of a patient dying a few days after labor, he found that it was the seat of a diffuse adenomyoma and that the stroma of these islands had been converted into typical decidua.

#### SUMMARY.

In the examination of fifty uncomplicated diffuse adenomyomata of the uterus the mucous membrane origin of the glands could be traced in every case. In 6 additional cases where squamous-cell carcinoma of the cervix complicated adenomyoma of the body the continuity was established in 5 cases. In the 2 remaining cases of diffuse adenomyoma of the body, the clue as to the origin of the glands was destroyed by adenocarcinoma of the body. Thus in only one case out of 56 where I expected to find the glands originating from the mucosa, if my view as expressed in 1896 was correct, did I fail to find it substantiated. In the remaining 15 cases of subperitoneal or submucous adenomyomata we would naturally not expect to trace the relationship between the mucosa and the glands in the

14. Ueber wahre Epithel fuhrende Cystenbildung in Uterus Myomen, Leipzig und Wien, 1894.

15. Ein Retroperitoneal geliniges voluminoses Polycystom, entstanden aus Resten des Wolffschen Korpers, Beitr. zur Geb. u. Gyn., iv., 61.

myoma; nevertheless in one case (Gyn. 10314) the mucosa literally flowed into the myoma. It will thus be seen that when we include adenomyomata of every kind, whether subperitoneal, submucous or diffuse, I have been able in 56 out of 73 cases to trace the origin of the gland element to the uterine mucosa.<sup>16</sup>

All adenomyomata of the uterus in which the gland elements are similar to those of the uterine mucosa, and are surrounded by stroma characteristic of that surrounding the normal uterine glands, owe their glandular origin of the uterine mucosa or to Müller's duct, no matter whether they be interstitial, subperitoneal or intra-ligamentary, solid or cystic.<sup>17</sup>

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16. Owing to lack of space it is impossible for me to give a detailed report of these cases. They will be reported with illustrations in a book on "Fibroids," which Dr. Kelly and I hope to publish later.

17. Frequently there are small cyst-like spaces apparently just beneath the peritoneal surface of the uterus. These are lined by a single layer of cuboidal cells and rest directly on the muscle. They are due to depressions from the peritoneal surface cut at another level. In favorable sections their continuity with the peritoneal cavity can be traced. Meyer has recently pointed them out. I thoroughly agree with his findings and have also often met with them on the under or protected side of tubal adhesions or lining the small depressions occurring on the surface of the ovary. The peritoneal cells, where protected, tend to become cuboidal.

THE CONDITION OF THE UTERINE MUCOSA  
IN MYOMA CASES

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## THE CONDITION OF THE UTERINE MUCOSA IN MYOMA CASES.

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SINCE 1893 I have been paying especial attention to the various degenerations that occur in uterine myomata and incidentally to the condition of the uterine mucosa in such cases. The myoma cases admitted to the Johns Hopkins Hospital from its opening in 1889 to July 1, 1906, together with those occurring in the private practices of Dr. Kelly and myself up to that date, amounted to between 1400 and 1500. In the majority of these the uterine mucosa has been carefully examined histologically. In most of our cases in which the uterus was removed supravaginal amputation was employed. As a consequence only in a relatively small number of the cases have we been able to ascertain the histological appearance of the vaginal portion of the cervix.

In nearly all cases in which the uterus was removed we have carefully opened the uterine cavity and studied its appearances both macroscopically and histologically. Pieces of mucosa have been removed from various portions of the cavity, especial attention being given to any area suggesting the least pathological change. It will readily be understood that a histological examination of the mucosa from all parts of the cavity in over 1000 cases would be out of the question, and that the pathological changes in a few cases have



undoubtedly been overlooked. The findings on the whole, however, are relatively accurate.

The mucosa of the uterus is naturally divided into two main kinds: that from the cervix and that lining the uterine cavity. We shall, therefore, consider them separately.

#### CHANGES IN THE CERVICAL MUCOSA.

Edema.

Hypertrophy.

Atrophy.

Dilatation of the cervical glands.

Cervical polypi.

Unfolding of the cervical glands.

Cervical endometritis.

Suspicious changes in the cervical mucosa.

Carcinoma of the cervix.

**EDEMA.** In only one case was edema of the mucosa noted. Here the uterus was partially inverted by a submucous myoma.

**HYPERTROPHY.** Marked increase in the size of the cervix was noted four times. In each of these cases there was a prolapsus of the uterus. The mucosa in such cases usually shows marked thickening of the squamous epithelium of the vaginal portion of the cervix, and the papillæ projecting into the squamous epithelium are longer than usual and show marked branching.

**ATROPHY.** Where partially submucous cervical myomata exist the cervix is occasionally so unfolded that little of it remains. The cervical mucosa is put on marked tension and on account of the stretching becomes much thinner than usual. The apparent atrophy is in reality not an atrophy, but a thinning out of the mucosa to allow it to cover a wider area.

**DILATATION OF THE CERVICAL GLANDS.** Enlarged glands are very common in the cervix and are often recognized as slightly raised circular translucent areas. In our experience dilated glands are not more frequent in myoma cases than in those in which no tumor exists. The dilated glands are usually spherical, but may be irregular. The gland contents, as a rule, are viscid and semitranslucent. Occasionally they are whitish yellow or opaque, owing to an abundance of exfoliated epithelium. Their epithelium may be high cylindrical or considerably flattened.

**CERVICAL POLYPI.** Polypi of the cervical mucosa in our experience have been comparatively rare in myoma cases. In some instances they were found near the internal os and in others near the external os or projecting slightly into the vagina. They were usually single, but occasionally several were present. The size of the uterus or the situation of the myomata seemed to have little or no influence on the development of the polypi, as they occurred just as frequently when the myomata were small and when no submucous nodules existed. On histological examination some of the polypi closely resembled the normal cervical mucosa, and were in reality nothing more than small areas of mucous membrane that had been extruded and partially nipped off. In other cases the process of extrusion had advanced farther; the polypi were composed of long narrow tongues of mucosa, and the point of attachment to the uterine mucosa was very slender. In San. No. 1872 (Gyn. Path. No. 8433) the glands of the polypi were uniformly and markedly dilated, and the picture resembled closely that of a thyroid gland.

**UNFOLDING OF THE CERVICAL GLANDS.** In those cases in which the cervical canal is much drawn out or where the mucosa of the cervix is put on great tension by a large submucous myoma, the glands may literally unfold. The gland epithelium thus forms part of the lining of the cervical canal. Although the squamous epithelium usually ends at or near the

external os, it may extend far up into the cervical canal. If such be the case, when the unfolding of the glands takes place the epithelial lining may consist of two types: squamous epithelium alternating with high cylindrical epithelium. Such a condition we have noted on several occasions.

**CERVICAL ENDOMETRITIS.** Inflammation of the cervical mucosa is relatively frequent where a sloughing submucous myoma or a carcinoma of the uterus exists, but is rarely found under other circumstances even if there is an old inflammatory process in the adnexa. In Case 3199, in which the cervical glands showed proliferation, there was marked small-round-celled infiltration, but the surface epithelium was intact. In Case 12221 there was likewise new gland formation. In the cervix in places the surface epithelium was intact, but at other points replaced by granulation tissue. In Case 2800 (Gyn. Path. No. 312) the omentum was adherent to the large multinodular uterus over a wide area, and the appendages were bound up in adhesions. The cervical mucosa presented a branching arborescent appearance. The surface epithelium was intact; the underlying stroma showed marked small-round-celled and polymorphonuclear infiltration. In Case 12139, the woman had been in the hospital seven years before, and at that time a pelvic abscess had been evacuated per vaginam. When the abdomen was opened the omentum was found glued to the myomatous uterus and general pelvic adhesions were encountered. Sections from the cervix showed that the surface was covered with polymorphonuclear leukocytes. The epithelium was intact, but the underlying stroma showed much small-round-celled infiltration.

**SUSPICIOUS CHANGES IN THE CERVICAL MUCOSA.** In at least five of our myoma cases sections from the cervix yielded rather suspicious histological pictures, where macroscopically nothing abnormal could be detected. The uterus in Case 3418 (Gyn. Path. No. 661) was the seat of a diffuse adeno-

myoma of the posterior wall. The cervical glands were in some places normal, but here and there showed proliferation. The epithelium lining the cervical canal was intact. In Case 3199 (Gyn. Path. No. 524) the multinodular myomatous uterus reached to the umbilicus. The cervical epithelium was intact, but the glands were smaller than usual and appeared to have proliferated. The newly formed glands were small and had a lining of cuboidal epithelium. They did not appear to extend far into the stroma, but the latter showed marked infiltration with small round cells. In Case 3349 (Gyn. Path. No. 610) the nodular myomatous uterus measured 10 x 12 x 16 cm. Some of the cervical glands were dilated. In close proximity to one of the glands was an aggregation of minute glands some of which were branching. They were lined with cuboidal ciliated epithelium, and had round or oval nuclei situated near the centre of the cells. The picture instantly suggested commencing adenocarcinoma. The myomatous uterus in Case 12221 (Gyn. Path. No. 8832) measured 6 x 7 x 10 cm. The cervical glands had proliferated, forming many new and smaller ones. The cell proliferation had in places advanced so far that solid nests were formed. These resembled masses of squamous epithelium. At other points the surface epithelium had been replaced by typical granulation tissue.

In one of our cases we found very suspicious changes in the uterine mucosa which strongly indicated that a malignant growth was starting in the mucosa. In Case 3133 the abdominal cavity was occupied by a myomatous tumor, 36 x 32 x 32 cm. On histological examination some very interesting changes were found. In one gland the epithelium on one side was normal, but on the other side the nuclei were increasing in size. One of them was exceptionally large and circular and projected into the lumen of the gland. At other points were nuclei at least ten times the usual size. They stained very deeply and contained hyaline droplets. The stroma

surrounding these large cells showed marked small-round-celled infiltration (Fig. 1). The entire picture was suggestive of commencing carcinoma of the uterus. It will be noted that in each of these five cases the picture was suggestive of a beginning carcinoma, but in no instance was the evidence conclusive. In 2 of the 5 cases an inflammation of the cervix was present.

**CARCINOMA OF THE CERVIX.** In 18 cases carcinoma of the cervix was associated with uterine myomata. All of these cases will be described in detail in a forthcoming publication by Dr. Kelly and myself.

CONDITION OF THE MUCOSA LINING THE CAVITY OF THE  
UTERUS.

- (a) Size and shape of the uterine cavity.
  - (b) Partial obliteration of the uterine cavity.
  - (c) Blood in the uterine cavity.
  - (d) Pus in the uterine cavity.
  - (e) Glands running parallel to the surface of the mucosa.
  - (f) Extension of the muscle into the mucosa.
  - (g) Alteration in the bloodvessels in the mucosa.
  - (h) Thrombosis of the veins in the mucosa.
  - (i) Unusual shape of the glands.
  - (j) Edema.
  - (k) Dilatation or hypertrophy of the uterine glands.
  - (l) Uterine polypi.
  - (m) Atypical changes in the epithelium lining the uterine cavity.
  - (n) A small myoma developing in the uterine mucosa.
  - (o) Endometritis.
  - (p) Tuberculosis of the endometrium.
  - (q) Adenocarcinoma.
- (a) **SIZE AND SHAPE OF THE UTERINE CAVITY.** The size and shape of the uterine cavity depends in great measure

on the size and situation of the uterine nodules. If a myoma develops in the upper part of the fundus the cavity may remain normal in size. If the tumor is intraligamentary it may reach very large proportions without causing the cavity to increase in size. On the other hand, when a myoma remains interstitial and reaches large proportions, with the gradual enlargement of the tumor there is a corresponding lengthening and often a broadening of the uterine cavity. The cavity may retain its normal shape, but if invaded by submucous myomata it becomes greatly distorted and may be very tortuous. The following cases give a fair idea of the various shapes and sizes the uterine cavity may assume: In Case 2919 (Gyn. Path. No. 380) the multinodular myomatous uterus measured 11 x 13 x 14 cm. The myomata were interstitial and subperitoneal. The cavity of the uterus was scarcely more than 1 cm. in length. It is difficult to account for such a small cavity in a patient only thirty-four years of age. The mucosa, however, was fully 1 cm. thick. In Case 12086 (Gyn. No. 8727) the myomatous uterus was 22 cm. in breadth and 12 cm. in its anteroposterior diameters. The uterine cavity formed a cavernous space 5 x 6 cm. Its walls could not drop together because the uterine cavity was literally paved with myomata so that there had resulted a non-collapsible space. The uterus in Case 5734 (Gyn. Path. No. 2034) was much enlarged being converted into a lobulated tumor 14 x 19 x 27 cm. The great increase in size was due chiefly to three subperitoneal myomata averaging 11 cm. in diameter. The uterine cavity was narrow and tortuous, approximately 10 cm. long and averaging 1.5 cm. in diameter. In Case 3491 (Gyn. Path. No. 713) the globular uterus measured 16 x 16 x 16 cm. Occupying the posterior wall and projecting into the cavity was a myoma 12 cm. in diameter. The uterine cavity was 13 cm. long and 9 cm. broad in its upper portion. The globular uterus in Case 5617 (Gyn. Path. No. 1962) was 22 cm. in diameter and resembled a pregnant organ. Situ-

ated in the anterior wall was a myoma 17 cm. in diameter. The uterine cavity was 22 cm. in length and 13 cm. in breadth at the fundus.

One of the largest uterine cavities we have ever seen was furnished by Case 3133 (Gyn. Path. No. 494). The uterus was pear-shaped, measuring 32 x 32 x 36 cm. The great increase in size was due to a myoma which occupied the anterior wall. The uterine cavity was 31 cm. long and varied from 9 to 14 cm. in breadth. Situated in the posterior wall about 12 cm. from the fundus was a yellowish area 3 cm. in diameter, and from this mucus mixed with blood escaped into the uterine cavity. This secondary cavity on histological examination was found to be lined with one layer of epithelium and seemed to be a markedly dilated gland.

The foregoing examples are sufficient to show that the uterine cavity may assume almost any size and shape, and, further, that the enlargement depends entirely upon the size and position of the myomata.

(b) PARTIAL OBLITERATION OF THE UTERINE CAVITY. In a few of the cases in which submucous myomata are present the mucosa from the anterior wall is so firmly pressed against that of the posterior wall that the walls are becoming adherent and the mucosa over this area is disappearing. In Case 3008 (Gyn. Path. No. 435), for example, in which the multinodular myomatous uterus filled the pelvis, the uterine cavity, which was 6 cm. in length, had become partially obliterated by a submucous nodule which was situated in the anterior wall and had become adherent to a similar nodule in the posterior wall, thus giving the cavity an "X-shaped" contour. The uterine mucosa was normal, on the whole, but toward the point where the uterine cavity was partially obliterated the mucosa became somewhat atrophied, and that from the anterior wall fused with that of the posterior wall. The glands gradually diminished in number and then entirely disappeared, leaving only a small amount of stroma. This

finally disappeared and the muscle from the anterior wall became continuous with that from the posterior wall. At the point of junction were numerous bloodvessels, and the muscle showed small-round-celled infiltration. Still further toward the upper part of the cavity the mucosa gradually reappeared and near the top of the cavity regained its normal appearance. In Case 3111 (Gyn. Path. No. 479) the multinodular myomatous uterus measured 9 x 10 x 9 cm. The uterine cavity was 5 cm. in length. The mucosa covering the small submucous myoma in the anterior wall had become adherent to the corresponding mucosa of the posterior wall, thus partially obliterating the cavity. On histological examination it was found that where the nodule projected into the uterine cavity the mucosa suddenly became compressed and that from the anterior wall became directly continuous with that from the posterior wall. The mucosa became still more atrophied, and over the most prominent part of the nodule entirely disappeared. Here the muscle from the posterior wall was directly continuous with that covering the submucous myoma.

The line of fusion was still recognizable by a moderate infiltration with small round cells.

Coalescence of the uterine walls rarely occurs, but it is not infrequently simulated by submucous myomata, which greatly narrow the lumen of the cavity. In such cases they have merely pushed the mucosa in front of them without causing fusion with the opposite wall.

(c) BLOOD IN THE UTERINE CAVITY. As a rule, when the cavity of the uterus is opened little or no blood is found, but occasionally, as in Case 8733, the cavity will be found partially or completely filled with blood. In this case the contents were tarry masses and recent coagulated blood. If blood is present in the cavity the amount will depend upon the copiousness of the flow and the ease or difficulty with which it has been able to escape from the cervix.



(d) PUS IN THE UTERINE CAVITY. A definite pyometra is rarely associated with myomata, but occasionally at operation a small amount of pus is found in the uterine cavity. In Case 2098 the lower abdomen was filled with a myomatous uterus, and a small quantity of pus was found in the cavity. In Case 12439 the large multinodular uterus was adherent in the pelvis and also firmly fixed to a loop of small bowel. Both tubes were filled with pus. The cavity of the uterus contained pus. The uterine cavity had evidently long been the seat of an inflammation as the mucosa had been replaced by granulation tissue.

In all cases in which there is a foul discharge from the uterus any abdominal operation should be postponed until the discharge has been eliminated, as there is great danger of infection. Of course, in some cases immediate operation is imperative irrespective of risks.

#### THE MUCOSA.

If the myomata are so situated that the uterine cavity is not encroached upon nor enlarged, and provided the tubes are normal, it can, as a rule, be assumed that the uterine mucosa is normal. The mucosa may occasionally, however, be somewhat thicker than usual or in rare instances may be gathered up into irregular mounds which produce localized areas of very thick mucosa.

When interstitial myomata reach very large dimensions they usually cause a corresponding lengthening and broadening of the uterine cavity. The normal amount of mucosa must now cover an area sometimes twice, in other instances four or more times, as great as heretofore, and will naturally be only one-quarter of the usual thickness. If the myoma is small or of moderate size, it will generally become subperitoneal or submucous. If it passes toward the cavity of the

uterus the overlying mucosa gradually becomes thin (Fig. 2). This thinning out becomes more and more marked until finally little or no mucosa can be detected over the more prominent part of the tumor, and sometimes it is clearly evident even to the unaided eye that the prominent part of the tumor is totally devoid of a mucous membrane covering. When a myoma is small, the amount of tension on the mucosa is naturally not as great, and the tumor, even if pedunculated, may still have a liberal covering of mucosa. With the continued inward progress of the myoma the mucosa becomes thinner and thinner until all traces of the glands disappear and there is merely the surface epithelium and a zone of underlying stroma separating the myoma from the uterine cavity (Fig. 3). The stroma becomes more and more thinned out until only a few layers of stroma cells are interposed between the myoma and the surface epithelium. Finally, when the myoma projects far into the cavity, the mucosa may be represented merely by a layer of somewhat flattened epithelium resting directly on the myoma.

The next stage was so well seen in Case 8767 (Gyn. Path. No. 4959) that we will describe it in detail. The specimen consisted of a globular uterus averaging 15 cm. in diameter. The great increase in size was due to an interstitial myoma approximately 17 cm. in diameter, and occupying the posterior wall. The uterine cavity was 15 cm. in length and its mucosa averaged 1 mm. in thickness. At one point over the myoma the mucosa had entirely disappeared over an area 7 x 5 cm. (Fig. 4). The myoma here was dark brown in color and somewhat roughened. On histological examination the mucosa lining the uterine cavity was found to be perfectly normal, but near the denuded area it became thinner and thinner until nothing but surface epithelium remained. This disappeared and the myomatous tissue which had undergone hyaline transformation formed the surface. Scattered throughout the hyaline material were quite a number of polymorphonuclear

leukocytes. The next stage would be breaking down of the degenerated myomatous tissue with a speedy formation of a sloughing submucous myoma.

In some cases myomata are very abundant and literally fill the uterine cavity. In such cases the walls resemble a mosaic. Over the myomata the mucosa is very thin, while the spaces between the myomata are filled with mucosa which is often injected and much thickened. Case 2658 (Gyn. Path. No. 213) affords an excellent example of such a condition. The uterus was approximately globular, measuring 13 x 11 x 11 cm. Scattered throughout the walls were many small myomata. The uterine cavity was 5 cm. in length. Projecting into it from the top were two pedunculated myomata. The entire inner surface of the uterus was filled with myomata varying from 0.3 to 3 cm. in diameter. The intervening spaces were occupied by injected mucosa, which in one cleft reached 8 mm. in thickness. On histological examination the mucosa was in some places virtually absent and in others reached 8 mm. in thickness. That covering the submucous nodules over their most prominent portions was represented by one layer of cylindrical epithelium resting almost directly on the myomatous tissue. On passing away from the most prominent portion of these tumors the mucosa again regained its normal thickness.

In a few cases the thickened mucosa in the crevices between myomata showed typical gland hypertrophy.

(e) GLANDS RUNNING PARALLEL TO THE SURFACE OF THE MUCOSA. It is no uncommon thing to see the deeper portions of the glands running parallel with, instead of at right angles to, the surface. This is especially prone to occur over the less prominent portion of a submucous myoma. In such cases it seems that with the ingrowth of the myomata the deeper portions of the glands are pressed upward until they are at right angles to their superficial portion. This will only apply to a certain percentage of the cases, as we have

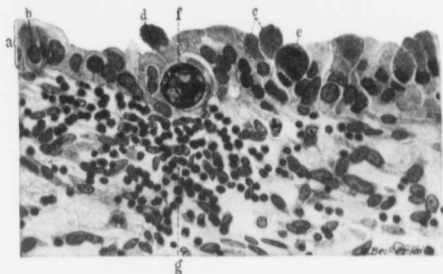


FIG. 1.—Suspicious epithelial changes in the mucosa of the cervix from a large myomatous uterus. ( $\times 390$ .)

Gyn. No. 3133, Path. No. 494. *a* represents the normal thickness of the surface epithelium; *b* shows a nucleus of normal size; *c*, *d*, and *e* are granular masses of protoplasm of various sizes. They resemble miniature puff-balls and are devoid of nuclei; *f* is an exceedingly large nucleus containing aggregations of chromatin and large and small hyaline droplets. This nucleus is strongly suggestive of an early malignant change. Nature evidently fears trouble, as she is partially walling it off with many small round cells, *g*.

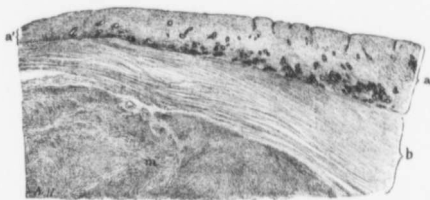


FIG. 2.—Thinning out of the mucosa over a submucous myoma. ( $\times 54$ .)

Gyn. No. 3008, Path. No. 435. *a* indicates the normal thickness of the mucosa and *b* the layer of muscle separating the submucous myoma from the mucosa. Toward the left the myoma becomes more prominent and the muscle and mucosa gradually become thinner until at *a'* all traces of the glands have disappeared and the mucosa is represented merely by the surface epithelium and a certain amount of underlying stroma.

Fig. 5.—Marked dilatation of veins of the uterine mucosa. ( $\times 11$ ).  
 Gyn. No. 524. *a* is the mucosa; *b* the underlying muscle. The  
 surface epithelium in the glands is normal, but the veins (*c*) are  
 greatly dilated.

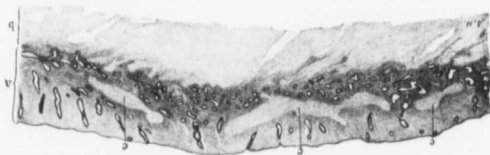


Fig. 4.—A submucous myoma almost devoid of mucosa. ( $\times 14$ ).  
 Gyn. No. 3293, Path. No. 583. The surface epithelium (*a*) is all that  
 remains of the mucosa. It rests directly on the myomatous tissue.

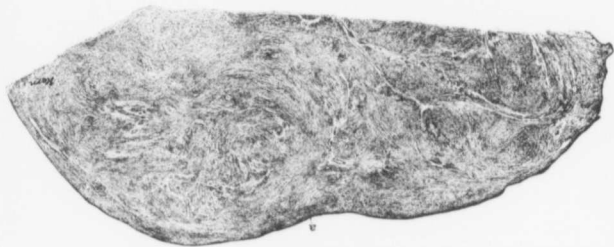


Fig. 3.—Atrophy of the mucosa over a submucous myoma. ( $\times 140$ ).  
 Gyn. No. 3218, Path. No. 539. The surface epithelium (*a*) is normal;  
*b* is the zone of underlying stroma devoid of glands; *c* is the muscle.  
 The myomatous tissue lies immediately beneath this. A few strands  
 of muscle are passing up into the stroma at *d*.

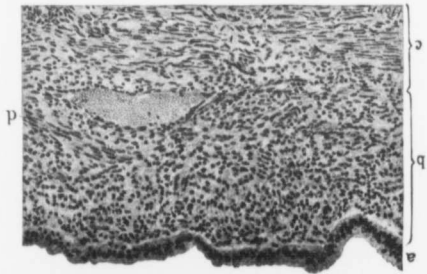




FIG. 6.—Rupture with subsequent thrombosis of a vein in the uterine mucosa over a submucous myoma. ( $\times 100$ .)

Gyn. No. 8354, Path. No. 4539. *a* represents the remnant of the atrophic uterine mucosa covering the large submucous myoma; *b* is the underlying muscle. Occupying the upper part of the field is a large vein. The vein at *c* still contains normal blood, but at *d* is filled with a thrombus which reaches up and opens on the surface. There has undoubtedly been a recent hemorrhage from this vein.

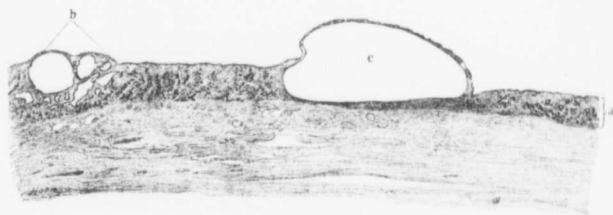


FIG. 7.—Markedly dilated uterine glands. ( $\times 5$ .)

Gyn. No. 3232, Path. No. 543. *a* is the normal mucosa. At *b* the glands show cystic changes. The smaller cysts were irregular, the larger spherical. *c* is one of the markedly dilated glands. The surface epithelium is continued over it. All trace of the epithelial lining has disappeared from the inner walls of the greatly dilated glands, although still present in those showing only moderate dilatation.

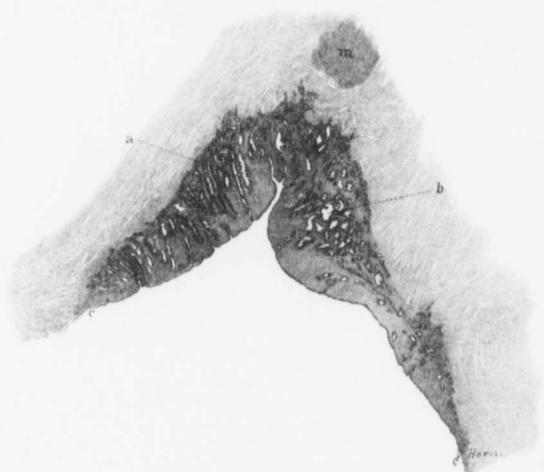


FIG. 8.—Gland hypertrophy in a cleft between myomatous nodules (× 4).

San., December 9, 1899. Path. No. 3674. The slightly irregular myomatous uterus measured 13 x 10 x 10 cm. Scattered throughout its walls were myomata, the largest 7 cm. in diameter. The uterine cavity was approximately 10 cm. in length, but much distorted and narrowed by submucous nodules. The mucosa was smooth over the submucous nodules, but was as thin as parchment, and where not subjected to pressure, reached from 2 to 3 mm. in thickness. On histological examination the mucosa presents an undulating surface and an intact surface epithelium. Over the prominent portion of the submucous myomata it consists merely of a narrow layer of stroma covered with epithelium but devoid of glands. In the protected areas the mucosa was much thickened. The picture represents such an area. At *c* and *c'* the surface epithelium rests directly on the muscle, but in the cleft becomes even thicker than normal. It shows typical gland hypertrophy, well seen at *a*. Some of the glands, as at *b*, are dilated; *m* is a small myoma.

not infrequently seen this deflection of the glands where no submucous myomata were present.

(f) EXTENSION OF THE MUSCLE INTO THE MUCOSA. It is a common occurrence to find one or more uterine glands extending a short distance into the muscle, especially if there is an adenomyomatous tendency, but extension of the muscle bundles into the mucosa is relatively rare. In Case 2852 (Gyn. Path. No. 347) some of the uterine glands were much dilated. The stroma of the mucosa showed moderate hemorrhage in its superficial portion and here and there bundles of muscle fibers extending into it. The picture in Case 3113 (Gyn. Path. No. 487) was even more marked. The mucosa was atrophied. The surface epithelium was intact. The glands were few in number and small and round on cross-section. The stroma of the mucosa showed considerable infiltration with small round cells, and non-striated muscle fibers were seen passing up into the stroma of the mucosa nearly as far as the surface epithelium.

(g) ALTERATION IN THE BLOODVESSELS OF THE UTERINE MUCOSA. In myoma cases, as a rule, the mucosa presents the usual appearance if the tumors do not encroach on the mucosa. Even if there be a marked projection of the tumor into the cavity, little or no change in the mucosa may be noted. In a moderate number of cases the mucosa is of a bright-red color, apparently due to congestion of the capillaries. More common are foci of ecchymosis. The ecchymotic spots, if recent, are bright red in color and appear as splotches of red. They are irregular in outline and sharply differentiated from the surrounding normal mucosa. Sometimes they are found in a mucosa of the normal thickness, but are more likely to be noted over the more prominent surface of a large submucous myoma. As the hemorrhagic areas become altered they change in color, being in turn dark red and then almost black. When the mucosa is exceedingly thin, dilated veins beneath the mucosa are often clearly visible. These veins are



frequently greatly increased in size when large myomata are present (Fig. 5).

On histological examination one frequently notes a marked abundance and dilatation of the capillaries in the superficial portions of the mucosa. In those cases in which ecchymosis has been noted there is usually much free blood in the stroma of the mucosa. This may be fresh or may show a moderate degree of disintegration. In most cases all trace of the hemorrhage then disappears, but occasionally a blood pigment remains. Thus in Case 3960 (Gyn. Path. No. 971) the uterine cavity was 3 cm. in length, 3 cm. in breadth, and its smooth mucosa presented numerous fine ecchymoses varying from 2 to 3 mm. in diameter. In sections from these areas the surface epithelium was intact and the glands were normal. The stroma of the mucosa showed small-round-celled infiltration, and there were deposits of pigment. In Case 3492 (Gyn. Path., No. 711) a myoma, 10 cm. in diameter, projected into the uterine cavity. Scattered throughout the mucosa were numerous patches of ecchymosis. On histological examination the mucosa covering the submucous myoma was found to be atrophic, and there was also edema. When the ecchymotic patches were noted large quantities of an almost black pigment were found in the stroma. This pigment occurred in irregular clumps or in minute specks. Whether it was contained in the cells or not it was difficult to determine. It is most exceptional to find any evidence of definite bleeding vessels in the mucosa. The surface epithelium is invariably intact, and the bleeding seems to be just a general ooze from the vessels into the mucosa without any especial injury to their walls. In all of the cases just described the hemorrhage was into the mucosa and the surface was smooth. In Case 7688, however, where the cavity of the uterus was distorted by an interstitial and submucous myoma, the mucosa showed large hemorrhagic areas which to a great extent were covered with fibrin and blood.

(h) THROMBOSIS OF THE VEINS IN THE MUCOSA. In Case 6667 (Gyn. Path. No. 2900) the patient gave a history of sudden hemorrhage four years before and afterward had had profuse bleeding each month. The cavity of the uterus was occupied by one large and two small myomata. On histological examination several large thin-walled veins of the atrophic mucosa were found thrombosed. In Case 8354 (Gyn. Path. No. 4539) the uterus was greatly enlarged as a result of subperitoneal, interstitial, and submucous myomata and the uterus contained a very large polyp. The mucosa lining the uterine cavity was very thin. Its surface epithelium was intact but flattened. The glands were small. The stroma showed slight infiltration. Occasionally we found a thrombosed vessel simulating, to a limited extent, a young tubercle. At one point, at least, the walls of the superficial veins had given way,<sup>1</sup> but the leak had been partially controlled by a thrombus (Fig 6).

(i) UNUSUAL SHAPES OF THE GLANDS ASSOCIATED WITH UTERINE MYOMATA. It has been noted that where myomata do not encroach upon the uterine cavity the cavity is usually of the normal size and, further, that the mucosa is, as a rule, normal in appearance and the uterine glands of the usual type. Even if a submucous myoma is present the only change in the mucosa will be a thinning out. In a few instances we have found unusual gland patterns. These changes consist in the sending off by the gland of one or more branches; sometimes five or six branches are noted. None of these pictures, however, in any way suggests malignancy.

(j) EDEMA OF THE MUCOSA is only occasionally met with. Edema is usually recognized by the succulent character of the tissue in which it is found and by the escape of serous fluid from the cut surface. The uterine mucosa has a glistening translucent appearance that might very readily be mistaken for edema when none exists. As a rule the diagnosis can be made only on histological examination. Edema

<sup>1</sup> This agrees with the previous findings of Dr. John G. Clark.

of the mucosa is usually limited to the superficial portions and is absent near the muscle. It may be localized or uniform throughout the cavity. It occurs irrespective of whether submucous myomata are present or not. The surface epithelium is intact, and the glands are usually normal. The stroma cells are separated from one another by a granular material, which undoubtedly is coagulated serum. A certain amount of fibrin can also be demonstrated in some cases with Weigert's stain. Occasionally the exudate is exceptionally rich in albumin. It then forms a homogeneous mass that takes the eosin stain. When the edema is very pronounced not only is much serum poured out into the stroma but also into the glands, and the surface epithelium may be separated from the stroma by serum. Occasionally the lymph vessels in the underlying muscle may be dilated as in Case 4203 (Gyn. Path. No. 1116).

(k) DILATATION OF THE UTERINE GLANDS. In a moderate number of myoma cases we have found slight dilatation of some of the uterine glands. The dilated glands may be present in any part of the cavity, but are more prone to occur where submucous myomata are present. The smaller ones are recognized as spherical cysts, 0.5 to 1 mm. or more in diameter, and filled with translucent or transparent contents. If the mucosa is atrophied these small cysts stand out prominently. They are also especially noticeable in uterine polypi. In rare instances the cysts become relatively large and project from the atrophied mucosa. In Case 3232 the uterine cavity was much increased in size, and the mucosa over a large submucous myoma had numerous cysts or blebs projecting from its surface. These cysts tended to arrange themselves in rows, had exceedingly thin walls, and ramifying over their surfaces were delicate traceries of bloodvessels. They were filled with clear limpid fluid. Occasionally the dilated glands contain small yellow bodies that float around in a clear fluid. These bodies usually consist of masses of exfoliated epithelial cells.

On histological examination it is found that the glands showing moderate dilatation have an intact cylindrical epithelium. They may be either empty or contain a granular detritus or a solid coagulum resembling a hyaline cast. When the glands become still more dilated the epithelium may yet retain its normal form, but is usually flattened (Fig. 7). In a few instances, as in Case 3437, the epithelium shows proliferation, being several layers in thickness. When great dilatation occurs the epithelium may entirely disappear. An example of apparently tremendous gland dilatation is furnished by Case 3133 (Gyn. Path. No. 494). The uterus was pear-shaped and 36 x 32 x 32 cm. The uterine cavity was 31 cm. long and varied from 9 to 14 cm. in breadth. Its mucosa was atrophied and projecting into the cavity from the upper part were three large polypi. Situated in the posterior wall about 12 cm. from the top of the cavity was a yellowish area 3 cm. in diameter. From this mucus mixed with blood escaped into the uterine cavity. This cavity had smooth walls. On histological examination marked atrophy of the mucosa was found. Most of the glands had disappeared. The cyst-like cavity near the middle of the uterus and communicating with the uterine cavity was lined with one layer of epithelium similar to that covering the surface of the mucosa. This cavity was in all probability a dilated uterine gland. The fact that it contained mucus, however, suggested the possibility of its being of cervical origin.

*Gland hypertrophy* was noted in several cases. When present it was usually associated with submucous myomata, and macroscopically it was noted that the mucosa was thicker than usual. The hypertrophic changes were almost invariably limited to the superficial layers of the mucosa (Fig. 8). As to the cause of gland hypertrophy we are in the dark. In Case 7795 (Gyn. Path. No. 4055), in which a right tubal pregnancy existed, the exciting factor was of course evident.

(f) UTERINE POLYPI. On opening the cavity of a myomatous uterus one or more polypi were not infrequently found. These may be situated in any part of the cavity, but are more prone to occur in the upper part. Polypi were found in large and small myomatous uteri. The size of the organ seemed to have little or no influence on their development.

Some of the polypi were very small and appeared as little flat and yet sharply outlined elevations from the surface of the mucosa. They appear to be nothing more than small portions of the mucosa which are heaped up. As the polypi grow larger they become somewhat pedunculated. The majority have broad bases and are relatively thin, being not over 1 to 2 mm. in thickness. Nearly all of them point downward. The polypi in Case 3038 (Gyn. Path. No. 452), however, is one of the rare exceptions. This was 1.5 cm. long and 4 mm. broad; it was attached near the internal os and pointed upward. The polypi are usually smooth and consist of a whitish-yellow semitranslucent substance—uterine mucosa. Scattered throughout it one often sees small cystic spaces—dilated glands. The lower and free margins of the polypi are often deeply injected from hemorrhage into their dependent portions. The uterine mucosa surrounding the polypi may be of the normal thickness, atrophic or even show an increase in thickness. In a few cases the mucosa showed a definite tendency to gather into ridges or folds, but no definite polypi had developed. In Case 4955 (Gyn. Path. No. 1484) the globular uterus had a cavity 15 cm. long and 7 cm. broad. The mucosa covering the posterior wall was pale, smooth, and averaged 2 mm. in thickness. The surface was concave, having been subjected to pressure from a tumor occupying the anterior wall. Near the fundus the mucosa was gathered up into a broad flat mound 3 cm. in diameter and 1 cm. thick. Its margins were slightly injected.

Histological appearances of polypi from the body of the

uterus. Uterine polypi are nothing more than portions of the mucosa that have been partially extruded, and with the succeeding and frequent contraction of the uterus have been forced out into the cavity. If the uterine mucosa from which the polyp is nipped off is normal, then we should expect the polyp to consist of normal mucosa. The surface of the polyp is usually smooth. The majority of the glands present the usual appearance, but as a result of obstruction some of them tend to become cystic and their epithelium flattens. In the stroma or pedicle of the polyp non-striated muscle is not infrequently found. This is due to the fact that some of the muscle is drawn out with the mucosa as it is being extruded. The mucosa near the tip of the polyp often shows considerable hemorrhage. A few of the polypi show slight disintegration; the gland epithelium tends to drop off and the gland cavities are filled with hyaline-like casts, as was noted in Case 3113 (Gyn. Path. No. 487). When the uterine mucosa is the seat of gland hypertrophy the polypi will, as a rule, also show hypertrophy of the glands. This was especially noticeable in Case 12021 (Gyn. Path. No. 8502).

(m) ATYPICAL CHANGES IN THE EPITHELIUM LINING THE UTERINE CAVITY. In addition to the cell changes found in endometritis and in cancer, we have also noted in a few cases a definite tendency for the surface epithelium to proliferate. In Case 3320 (Gyn. Path. No. 589), where the uterus was greatly enlarged as a result of subperitoneal and interstitial myomata, the epithelium covering the surface of the mucosa shows a slight tendency to proliferate being two or three layers in thickness at several points.

Proliferation of the surface epithelium was also noted in Case 3408 (Gyn. Path. No. 659) and in Case 6479 (Gyn. Path. No. 2700). Occasionally a small papillary growth may be detected arising from the surface of the mucosa. In Case 3133 (Gyn. Path. No. 494) the uterus was tremendously enlarged as a result of an interstitial myoma. The uterine

cavity was also greatly increased in size, being 31 cm. long and varying from 9 to 14 cm. in diameter. The mucosa was naturally greatly thinned out. About the middle of the cavity were delicate papillary outgrowths of the surface epithelium. In Case 3340 (Gyn. Path. No. 607) the uterus was the seat of subperitoneal, interstitial and submucous myomata, and the uterine cavity was 6 cm. long. The mucosa was somewhat atrophied. The surface epithelium was everywhere intact and in most places normal, but near the submucous myomata were three finger-like outgrowths of epithelium, and not far distant from these the surface epithelium had proliferated, being 3 or 4 layers in thickness. The newly formed cells stained more faintly than normal epithelial cells, and they were separated from each other by a moderate number of polymorphonuclear leukocytes. The uterine glands were normal. Were the mucosa lining all portions of the uterine cavity systematically examined histologically we feel sure that such alterations in the surface epithelium as we have noted would be much more frequently found. Some of them undoubtedly indicate a commencing malignant change, while others would advance no farther.

(n) A SMALL MYOMA DEVELOPING IN THE UTERINE MUCOSA. In Case 5808 (Gyn. Path. No. 2101) the uterus formed a globular tumor 14 cm. in diameter. Projecting from its posterior surface was a subperitoneal nodule 4.5 cm. in diameter, and the anterior wall contained an interstitial and slightly submucous myoma 12 cm. in diameter. The uterine cavity was 12 x 11 cm. Its mucosa was atrophied and some of its glands dilated. Projecting into its cavity was a tongue-shaped polyp 3.5 cm. long, 1.5 cm. broad. On histological examination the mucosa apart from atrophy and gland dilatation was little altered, except at one point, where lying in the mucosa was a definite flattened myoma. This myoma apparently had originated in the mucosa, probably from some preëxisting muscle fibers that were located there.

(o) ENDOMETRITIS. Inflammation of the endometrium has in our experience been relatively rare. About ten years ago I reported before the Medical and Surgical Faculty of Maryland the results of our examination of uterine mucosa for a period of four years. In that time we had noted 48 cases of endometritis. In other words, it was found on an average only once a month notwithstanding the large amount of material at our disposal. We were astonished at the infrequency with which it was encountered, and were still further surprised to find that even when the Fallopian tubes showed definite evidence of inflammation the endometrium was often unaltered. If an inflammation of the uterine mucosa does exist the excessive vascularity, together with the excellent drainage afforded by the more or less perpendicular position of the uterus, favors the speedy restoration to normal.

What applies to the endometrium in general is equally applicable in myoma cases. In our experience the mucosa rarely shows any inflammation when the uterus contains myomata. After carefully tabulating the cases in which there was an endometritis, usually very mild, we have found that with one or two exceptions the uterus either contained a submucous myoma, usually disintegrating, or the tubes showed definite evidences of a recent or old inflammation. These findings are of importance to the surgeon in that he can with almost certainty say that if the patient has no vaginal discharge and if the appendages are normal the uterine mucosa is unaltered. Knowing this he can open the uterine cavity if necessary, and be relatively certain that there is no danger of infection lurking there.

(p) TUBERCULOSIS OF THE ENDOMETRIUM. From the accompanying table it will be seen that we have had 7 cases in which, in addition to the myoma, tuberculosis of the endometrium was noted. In 6 of the cases the uterus was relatively small. Only in Case 3319 did it reach fairly large proportions. In two of the cases minute tubercles were



recognized on the surface of the uterus. In some of the cases involvement of the endometrium was early, in others nearly the entire mucosa was replaced by tuberculous tissue, and in Case 4965 the small uterine cavity was filled with creamy fluid. In Case 3319 the tuberculosis had extended to the muscle beneath the mucosa. In none of our cases, however, had the tuberculous process involved the myoma. In April, 1901, Dr. Homer Gage, of Worcester, Mass., sent us a specimen showing definite involvement of a myoma by tuberculosis. The interstitial myoma was approximately globular and 7 cm. in diameter. On section it presented a putty-like appearance and was very soft, fully three-quarters of the myoma showing this degeneration. Smears made by Dr. Gage yielded tubercle bacilli in moderate numbers. On making sections from the endometrium we found normal mucosa in places, but at other points the stroma showed small-round-celled infiltration, and at one point in the mucosa a definite tubercle was found. The myoma over a small area presented the typical appearance, but it was everywhere riddled by areas of caseation with surrounding zones of tuberculous tissue. All stages in the tuberculous process were demonstrable. Scattered throughout the myoma were a few islands of uterine mucosa. In other words, it was in part an interstitial adenomyoma. Both tubes were the seat of advanced tuberculosis. Just how the tuberculosis started in the myoma we are at a loss to say. It is well known that tuberculosis of the tubes is usually present where tuberculosis of the endometrium is found, and as seen from the table our cases closely followed this rule. In five both tubes were involved, in a sixth case one tube, and in only one case was there no evidence of tubal tuberculosis.

We must look upon the association of tuberculosis of the endometrium with uterine myomata as accidental.

TUBERCULOSIS OF THE ENDOMETRIUM ASSOCIATED WITH  
UTERINE MYOMATA.

Gyn. No.	Path. No.	Size of uterus.	Condition of tubes.	Endometrium.
3,319	592	15 x 17 cm.	Tuberculosis of both tubes.	Advanced tuberculosis. Commencing involvement of underlying muscle.
4,965	1499	4 x 3.8 x 3 cm. Myoma on surface. 5 cm. Cavity small, filled with creamy fluid.	Both tubes embedded in adhesions, but not tuberculous.	Early tuberculosis of endometrium.
6,991	3277	6 x 6.5 x 6 cm. Minute tubercles over surface.	Tuberculosis of one tube.	Early tuberculosis of endometrium.
8,220	4403	Slightly enlarged.	Tuberculosis of both tubes.	Early tuberculosis of endometrium.
9,636	5825	Myoma, 8 cm., in posterior wall.	Tuberculosis of both tubes.	Early tuberculosis of endometrium.
12,119	8714	7 x 8 x 7 cm. Several myomata on surface, the largest 14 x 11 x 11 cm. Minute tubercles on surface.	Tuberculosis of both tubes.	Tuberculosis of endometrium.
12,866	9755	7 x 8 x 8 cm.	Tuberculosis of both tubes.	Tuberculosis of endometrium.

(g) ADENOCARCINOMA OF THE BODY OF THE UTERUS. We have had quite a number of cases in which adenocarcinoma of the body of the uterus was associated with uterine myomata. These will be published in detail in the book on *Myoma* which Dr. Kelly and I have in press.

# Early Diagnosis of Cancer of the Uterus; Operative Technic.

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Baltimore, Md.

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(Read in the Section on Surgery, Medical Society of the State of Pennsylvania, Philadelphia Session, September 29, 1909.)

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## Early Diagnosis of Cancer of the Uterus; Operative Technic.

By THOMAS S. CULLEN, M. B.,  
Baltimore, Md.

In the various portions of the mucous membrane of the uterus three definite varieties are to be found. The mucosa, covering the vaginal portion of the cervix, is made up of squamous epithelium; that between the external and internal os consists mainly of racemose or branching glands which secrete a varying quantity of mucus; whereas in the portion that lines the cavity of the uterus are numerous tubular glands differing totally from those of the cervix. From each of these types of mucosa cancer may develop.

In cancer of the uterus there occurs an outgrowth from the surface of the mucosa, while at the same time the growth penetrates into the underlying tissue. The cancerous tissue in the beginning is so rich in blood vessels that the slightest disturbance of the growth is liable to cause bleeding, and not infrequently an increased blood pressure is sufficient to bring about a faint show. As the growth advances, the older and more friable portions become necrotic and there results a breaking down which gives rise to a watery discharge, often tinged with blood and frequently fetid. This discharge is usually the first symptom of cancer, but it may be totally wanting until the growth has reached large proportions. Cancer of the uterus is most common between the thirty-fifth and fiftieth years, but it is occasionally noted in patients under twenty-five years of age.

Any bloody or watery vaginal discharge that can not be definitely accounted for

demands an immediate and careful local examination. If on bimanual examination the cervix is found to be rough, friable and bleeding, the diagnosis of cancer is usually certain; but if the cervix is still intact, the diagnosis may be very difficult. In early carcinoma of the cervix, when no disintegration has occurred, the surface is usually nodular, and springing from it are fine finger-like outgrowths which bleed readily.

In every case a careful history should be taken but, even after all possible data have been obtained and after a thorough bimanual examination, it will not rarely happen that the physician can not determine to his satisfaction whether malignancy exists or not. In such cases a wedge of the suspicious area (about one cm. deep and two or three mm. broad) should be cut out, dropped at once into a ten per cent. formalin solution and sent to the pathologist, who in the course of a few days will be able to decide with almost absolute certainty whether cancer is present or not.

When the cervix, on bimanual examination, appears normal, the lesion is usually situated in the cervical canal or in the cavity of the uterus. The finding of an enlarged and nodular uterus renders it probable that myomata are present. When myomata are of the submucous variety, the monthly periods are usually excessive, but as a rule no intermenstrual bleeding occurs and no fetid discharge exists, unless sloughing of a submucous

nodule is going on. In the latter case, however, portions of the growth are apt to be found projecting from the cervix, and such sloughing masses are readily distinguishable from cancer of the cervix, because they are tough and not friable, and because the finger can be swept around them, proving that they have originated at a point higher up.

Extrauterine pregnancy frequently gives rise to intermenstrual bleeding and occasionally to a slight menstrual discharge, but in these cases we usually have a history of a missed period or of a period that has persisted, and in addition there is frequently the localized pain caused by the gradual distention of the tube. Finally, the bimanual examination will often reveal the definite, velvety mass to one side of the uterus.

Pelvic inflammatory conditions are at times accompanied by a bloody or watery vaginal discharge. In these cases we can usually learn that there has been some recent local vaginal infection or that an old pelvic lesion has recently been rekindled. In such cases there is often more or less elevation of temperature, whereas in early cancer there is no fever.

When the patient is stout, a satisfactory bimanual examination is often impossible, unless an anesthetic is employed. When the cervix feels normal and we have excluded myomata of the uterus and lesions of the adnexa, the cause of the bleeding usually lies in the cervical canal or in the cavity of the uterus. Whatever the uterine growth, it must drain into the uterine canal, otherwise there would be no vaginal discharge.

In such cases the uterus should be most thoroughly curetted. The mucosa should be brought away from the anterior, posterior and lateral walls and likewise from the cervical canal. If much tissue is obtained, it is probable that malignancy exists. All of this tissue, including the

blood, should be thrown into a ten per cent. formalin solution without preliminary washing and sent to the pathologist.

In some cases the pathologist has considerable difficulty in saying whether a given specimen is cancerous or not, but, as a rule, there is just as much difference under the microscope between cancerous and healthy mucosa as there is between two totally different patterns of wall paper. Although there is always a possibility of error, so exact is the aid obtained from the microscope in the examination of scrapings that in every instance during the last sixteen years in which we have made a microscopic diagnosis of cancer and have later examined the uterus, definite macroscopic evidence of cancer was present. Naturally, a thorough knowledge of the various pictures due to faulty hardening of the tissues, to gland hypertrophy with or without pregnancy, and those peculiar to the normal mucosa, in early life, during menstruation and in old age, is necessary before one can undertake to pass judgment on the character of scrapings.

From no other part of the body is it possible to so easily obtain material for diagnosis. Take, for instance, cancer of the stomach; how thankful the operator would be were it possible to just introduce a straight curet to the pylorus and bring away some tissue for diagnosis, without the necessity of making any incision or of doing any suturing. For the early diagnosis of cancer of the stomach, an exploratory operation is usually necessary. We as general practitioners and surgeons have absolutely no excuse for failing to diagnose cancer of the uterus within one week after the first time the patient comes under our observation.

#### THE BEST OPERATIVE TECHNIC.

To speak of the operative technic for cancer of the uterus before a Pennsylvania audience is akin to bringing coals to Newcastle when among others of your number

an old friend of mine, Dr. John Clark, has contributed so much to our knowledge of the subject. The operation as elaborated by Wertheim seems to offer the best results. It consists in the removal of the uterus, appendages and parametrium and often also of the pelvic lymph glands.

It is now generally recognized that the greatest dangers of the radical operation are due to the shock that immediately follows. More recent experience has shown that it is possible to lessen this shock in two ways, (1) by shortening the duration of the operation, (2) by keeping the patient warm while she is on the table and afterwards.

With the abundant flood of "sunshine," as furnished by Krönig's light, the operator can often save from fifteen to thirty minutes. This light should be in every operating room where much abdominal work is done.

The chief bleeding encountered in the radical operation is from the vaginal plexus of veins. The long, short-curved, Wertheim forceps enables one to clamp and cut the vessels with great facility, thereby often saving from ten to fifteen minutes. As was said before, this shortening of the operation by even ten minutes is all important.

By means of Krönig's electrically heated table the patient can be kept at an equable temperature and usually leaves the operating room in an infinitely better condition than when the ordinary table is used. The patient is cleaned up on the regular table, and after being thoroughly dried is placed on double blankets laid over the electric table. It is always necessary to have a special nurse or assistant guard against any danger of burning the patient, and the current should be turned on and off as necessary in order that a reasonably equable temperature may be maintained. In the course of a few weeks I operated on six cancer patients in succes-

sion and, although in some of them the operation was a most extensive one and the patients were weak, in not one case did there occur the marked degree of post-operative shock so often noted.

In the time at my disposal I have merely sketched the salient features in the diagnosis and treatment of cancer of the uterus and have omitted any consideration of polypi, adenomyoma, sarcoma and chorio-epithelioma.

In conclusion, I can not refrain from quoting an appeal made by the late J. Knowsley Thornton some years ago, at once an appeal to us as medical men and one of the severest arraignments of our profession that has ever been made in our management of cancer of the uterus.

How is an early diagnosis to be made? Clearly by neglecting no menstrual departure from the normal, however trivial it may at first sight appear, but at once to encourage the patient to accurately describe symptoms, and above all to insist in the most determined manner on a local examination. Here it will be apparent that I, as a consultant, appeal for help to the great body of those who are now listening to my remarks, to my professional brethren engaged in general practice. I, in common with those situated as I am, too seldom have an opportunity of diagnosing early, because the majority of the patients come to us too late, when the disease has already advanced nearly or quite beyond the limits of surgical aid. Let me then appeal to all engaged in family practice who listen to me here, and to that larger body who may read my words when reproduced in the medical journals, to sternly cast aside that too great modesty or that tendency to treat as trivial small symptoms, and to at once take alarm about, and carefully investigate, every case in which there is brought to their notice an abnormality in menstruation, or a vaginal discharge of any kind, however trifling. A very grave responsibility lies at the doors of the medical profession for the small progress made in the early diagnosis of uterine cancer and its successful treatment. How constantly is the consultant told: "I mentioned it to my doctor weeks or months ago, but he said, 'Oh, it is nothing; I will send you a little medicine or a little injection' and never even suggested any internal examination, so I did

not like to trouble him again till the pain became so bad or the discharge so troublesome, and then he examined me and said I must have special advice at once? Invaluable weeks or months gone, and then the verdict of the consultant, "It is not a case for operation," which really means "You have come too late," but can not be so candidly expressed, because he must guard the reputation of his professional brother. I admit that the false modesty of the patient, especially in some classes of society, makes the position a difficult one, especially for the young family doctor, but let me implore you all to awake to what is at stake, and to be firm in your demand for an examination,

and if you have any doubt after such an examination, to urge that the patient should at once seek the advice of some one who has larger opportunities than yourself for forming a sound opinion. I will go one step further, and ask you, if there should be any to whom such a temptation comes, never to go on treating a case in which there is a shadow of doubt, either because you doubt or because you want practice; if the case is susceptible of treatment at all, it is only surgical treatment which can avail, and that of so severe a kind that it requires the knowledge of the specialist if ever any disease did or does require special knowledge and special skill in operative treatment.

SOME POINTS IN THE OPERATIVE TECHNIQUE OF VAGINAL  
HYSTERECTOMY FOR PROLAPSUS

By THOMAS S. CULLEN, M. D., Baltimore, Maryland

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## SOME POINTS IN THE OPERATIVE TECHNIQUE OF VAGINAL HYSTERECTOMY FOR PROLAPSUS

By THOMAS S. CULLEN, M. D., BALTIMORE, MARYLAND

It is not my intention to discuss here the relative merits of the various abdominal or vaginal operations for prolapsus of the uterus. Marked prolapsus usually demands operative interference. If the patient comes prior to the menopause, the uterus should be preserved if possible, and even in women who have passed the menopause it may sometimes be deemed wiser to save the uterus on account of the probability of a prolapsus of the vaginal vault at a later date. In a certain number of cases, however, there is marked prolapsus of the uterus associated with much redundancy of the anterior and posterior vaginal walls and occasionally with a greater or less amount of ulceration. In this group of cases vaginal hysterectomy combined with a wide removal of the surrounding vaginal mucosa, closure of the vaginal vault and repair of the perineum, as described in the following paragraphs, gives excellent results.

The accompanying case was the first in which we employed this procedure.

*Vaginal hysterectomy with wide excision of the vaginal mucosa in a case of extensive prolapsus uteri with ulceration of the cervix and vagina.*

Mrs. E. L., aged 72, white, seen in consultation with Drs. Chapman and McCormick of Trappe and Brice Goldsborough of Cambridge, Md., March, 1905. This patient for 52 years has been suffering from prolapsus of the uterus, but never told her physicians about it until a few weeks ago. Until recently she has gotten along without much difficulty.

Accompanying the prolapsus is marked descensus of the bladder. The cervix (Fig. 1) is greatly thickened and there are teat-like projections from its surface. A long scar seven or eight cm. in length extends up the right side of the cervix along the vaginal vault. On the left side is a similar but smaller one not completely covered over with epithelium.

I outlined the area to be removed at the commencement by cutting just through the vaginal mucosa all the way around as indicated by the dotted line. I then dissected the vaginal mucosa downwards from the bladder, entered Douglas' cul-de-sac behind in order that I might get my bearings (Fig. 2), removed the uterus and joined the vaginal mucosa to the peritoneum of Douglas' pouch (Fig. 3). The peritoneum of the anterior pelvic wall was then sutured to that of the posterior wall, and in this way the pelvis was completely shut off (Fig. 4).

*Path. No. 8459.* The specimen consists of a prolapsed uterus together with a large cuff of



Fig. 1. *Marked prolapsus of the uterus.* The cervix is much enlarged and springing from it is a teat-like projection more than 1 cm. long. On the right side of the cervix and extending far out on to the vagina is an area of ulceration. A similar but smaller one is noted on the left. On the anterior vaginal wall are two small ulcerated areas. The dotted line indicates the outline of the incision. It passes through the vaginal mucosa but no farther. After it has been determined just how much vaginal mucosa should be removed with the cervix, this incision is carried completely around the cervix. In this case all the ulcerated area was naturally included and posteriorly a flap of vaginal mucosa 7 cm. broad was removed with the cervix.

vaginal mucosa. The cervix itself is 7 cm. wide, and 5 cm. in its anteroposterior diameter. Surrounding the cervix is a cuff of vaginal mucosa varying from 2 to 7 cm. in breadth.

In such a case as this one finger in the pelvic cavity is of the greatest assistance. After the area to be removed has been outlined and the vaginal mucosa has been carefully dissected downwards in front, care being taken not to enter the bladder, an incision is made behind the cervix and Douglas' pouch is entered. The left index finger

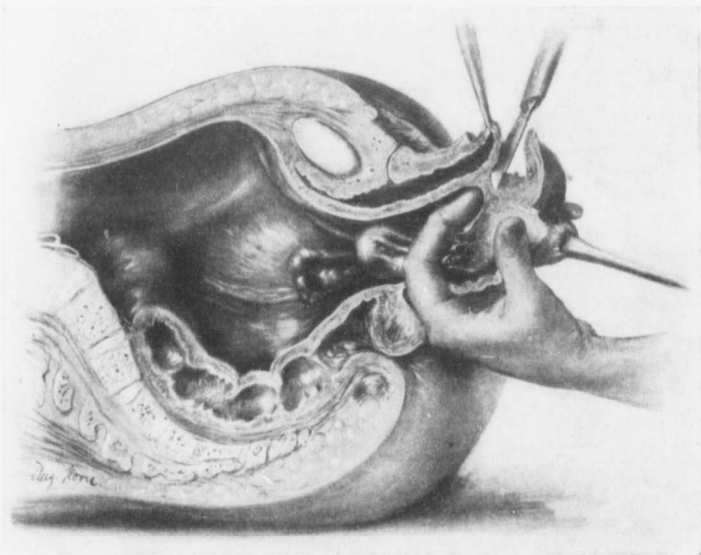


Fig. 2. *The finger as a guide in separating the bladder from the cervix.* The vaginal flap was dissected down wards from the bladder. Douglas' pouch was then opened up along the dotted line, and the left index finger carried down in front of the cervix tended to shove the bladder upward and away from injury while the knife dissected it from the cervix. In this case the tissue between the bladder and cervix was denser than usual.

can be passed through this opening, hooked over and carried down in front of the cervix between it and the bladder. The knife gradually cuts down upon this at a fixed point. By the employment of this method there is much less danger of injuring the bladder (Fig. 2).

After control of all the blood-vessels and removal of the uterus with or without the appendages, as is deemed advisable, the peritoneum of the pelvis is drawn down and attached to the vaginal mucosa. In this way the stumps of the vessels are completely covered over and nothing but a small opening persists between the pelvis and the vagina. When one removes a large area of vaginal mucosa, as in this case, and then joins the peritoneum to the vaginal mucosa, the remaining portion of the vagina is drawn up as it were into the pelvis, no slack being left (Fig. 3), and the bladder which has been

prolapsed is again carried up into a relatively normal position.

It is comparatively easy to join the peritoneum of the posterior part of the pelvis to that of the anterior part. By means of several sutures introduced at different levels the peritoneal surfaces are approximated over a considerable area and the now shallow vagina is completely cut off from the pelvis. Care must be taken when suturing the peritoneum not to pierce any of the large vessels, otherwise troublesome oozing or a hematoma may follow.

We have removed the uterus in this way in several instances with great satisfaction. The method is applicable chiefly to those cases where marked prolapsus exists.

If the tissues are not brought up quite as snugly as one would wish, the perineum may be repaired.

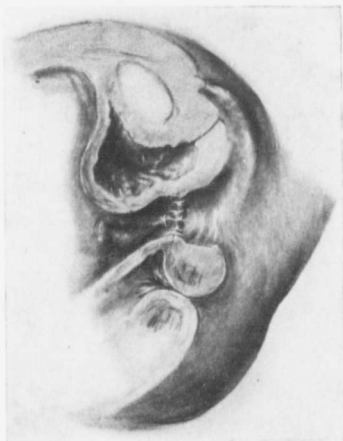


Fig. 3. Appearance of the lower part of the pelvis after the pelvic peritoneum has been united to the vaginal mucosa. The pelvic peritoneum has been joined to the vaginal mucosa by means of interrupted catgut sutures and the stumps of the vessels have been covered over. The bladder has been drawn well up and the vagina is much shortened.



Fig. 4. Closure of the pelvis. The pelvic peritoneum is united over an area from 2 to 3 cm. long, care being taken not to pierce any vessels. If the vagina is lax, the perineum should be repaired.

I thought that this operation was original (if any vaginal hysterectomy can really be considered new) until my visit to Rochester a few years ago. There I saw Dr. Wm. J. Mayo do an operation somewhat similar in character, the only differences being that he did not take out so large a cuff of vaginal mucosa surrounding the cervix as we have done, and that Douglas' pouch was not at once opened up and a finger introduced as a guide. These, of course, are only minor differences.

# A Large Cystic Tumor Developing from the Iliopsoas Bursa

CONTAINING LARGE FREE CARTILAGINOUS MASSES,  
AND COMMUNICATING WITH THE HIP-JOINT

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THOMAS S. CULLEN  
BALTIMORE

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FIVE HUNDRED AND THIRTY-FIVE DEARBORN AVENUE  
CHICAGO

## A LARGE CYSTIC TUMOR DEVELOPING FROM THE ILIOPSOAS BURSA

CONTAINING LARGE FREE CARTILAGINOUS MASSES, AND  
COMMUNICATING WITH THE HIP-JOINT

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THOMAS S. CULLEN

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*History.*—In November, 1908, I was asked by Dr. A. H. A. Mayer to examine a man aged 46 who had what appeared to be a very unusual pelvic tumor. About ten years before the patient had begun to limp, and a year later consulted a physician who told him that he had a tumor of the left hip. The condition gradually had become worse. For about a year the man had noticed that every time he put his weight on his left leg "something slipped" in his hip.

*Examination.*—The patient was a tall, rather anemic looking man. The chest sounds were normal. The left leg was stiff and when walking he held the left hip-joint as immobile as possible. Occupying the left iliac fossa and extending beyond the median line was a firm oval mass, 8 by 10 cm. This was continuous with a smaller mass which passed below Poupart's ligament and extended to the left of the hip-joint anteriorly. The large mass seemed to fill the left half of the pelvis. In some places it appeared to consist of bone, but at other points felt cystic. It seemed to be intimately connected with the pelvic bone. The glands in both groins were palpable. The left leg was three-quarters of an inch shorter than the right. On flexion of the leg the pelvic mass receded somewhat, but on extension the tumor again became prominent. Flexion, extension, adduction and abduction were accompanied by dull crepitation in or near the hip-joint. On carefully questioning the patient it was learned that the swelling had been first noticed just below Poupart's ligament.

*Operation.*—An incision was made just above and parallel with Poupart's ligament and the extraperitoneal tumor exposed. After displacing the anterior crural nerve, which was markedly stretched over the tumor, and splitting the muscle which lay over it, it was found necessary to sever Poupart's ligament as a portion of the tumor lay beneath it. The pelvic portion of the mass was loosened up easily on its anterior and

posterior aspects, but on the outer side was firmly attached to the ileum, and below seemed intimately related to the anterior portion of the hip-joint. After being walled off with gauze it was opened and there was an escape of clear viscid fluid, yellowish in color. Lying free in the cavity were five irregularly lobulated, hard cartilaginous masses (Figs. 1, 3). After these had been removed a sixth was found fastened down beneath Poupart's ligament. When this nodule had been taken out a

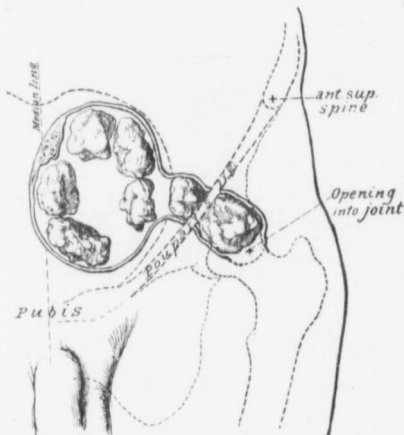


Fig. 1.—A cystic tumor developing from the left iliopectineal bursa containing large free cartilaginous masses and communicating with the hip-joint. Occupying the left half of the pelvis is a cystic tumor which on its outer side was firmly attached to the pelvic wall. The cyst walls were composed chiefly of fibrous tissue. The thickening in certain areas noted in the walls is due to deposits of bone. The cyst cavity was distended with clear yellowish, tenacious fluid and also contained five free and irregular cartilaginous masses. A narrow prolongation of the cyst passed downward and forward beneath Poupart's ligament and opened directly into the hip-joint. Filling this portion of the cyst was a large free cartilaginous mass. All the cartilaginous masses are shown in their natural size in Fig. 3.

finger carried downward and forward passed directly into the hip joint anterior to the head of the femur. The bones of the joint were perfectly smooth. The pelvic sac was gradually dis-

sected free at a point considerably below Poupart's ligament. It was then cut away and the remaining portion which formed the margin of the entrance into the joint was trimmed, turned in on itself, and snugly brought together with catgut sutures, thus securely closing the hip-joint. A small drain was laid in the upper angle of the wound far removed from the joint and the incision closed.



Fig. 2.—Part of the sac of a cystic tumor developing from the iliopectineal bursa. The picture represents the inner surface of the cyst. The walls vary from 1 to 2 mm. in thickness and in them are seen cross sections of plaques of bone. In other portions of the walls cartilage was noted. The inner surface presented a distinctly trabeculated appearance evidently due to the uneven stretching of the sac. Projecting into the cavity is an irregular bony mass fully 3 cm. in diameter. The sac was lined with a smooth glistening membrane; it contained clear yellow tenacious fluid and the six cartilaginous masses depicted in Fig. 3.

*Result.*—For a few days the patient did remarkably well but then became delirious and talked incoherently. It was learned that on a previous occasion he had shown similar cerebral dis-

turbances and that it had been necessary to confine him for a time in a sanitarium. Dr. Henry J. Berkley, who saw him in consultation, felt that his mental condition had nothing to do with the operation. The wound after draining for a few days closed completely and the patient left the hospital in excellent physical and mental condition five and a half weeks afterward. He was able to walk without much difficulty.

*Subsequent History.*—Dec. 6, 1909: Dr. Mayer informs me that the patient occasionally has some discomfort in his leg but no pain in the hip-joint. He still uses a cane.

*Description of Specimen.*—The walls of the sac were composed of fibrous tissue and scattered throughout them were plaques of cartilage and definite bony masses (Figs. 1, 2). Some of these fragments of bone were very small; others reached 3 cm. or more in diameter. The inner surface of the sac presented a trabeculated appearance (Fig. 2) evidently due to the unequal and gradual distention of the cystic tumor. Notwithstanding the uneven appearance the inner surface was everywhere covered by a smooth membrane. The fluid contents were clear, yellowish in color and rather sticky. The six irregular, white, cartilaginous masses filling the cavity are shown in their natural size in Figure 3. They were lying perfectly free and five of them popped out as soon as the sac was opened. The sixth could not escape as it was firmly held down by Poupart's ligament and its lower end entered the hip-joint.<sup>1</sup>

#### ORIGIN OF THESE CYSTIC TUMORS

One of the largest, if not the largest, bursa in the body is that situated beneath the tendon of the iliopsoas muscle. This complex muscle arises from the body of the twelfth dorsal vertebra, from the bodies of all the lumbar vertebrae, from the transverse processes of all the lumbar vertebrae and from the iliac fossa. The combined tendon is inserted in the trochanter minor. In order to reach this the iliopsoas muscle must curve around the crest of the ilium. It is beneath the muscle where it curves over the bone that the bursa is found. It lies beneath Poupart's ligament below and lateral to the iliopectineal eminence. According to some authors it may attain the size of a hen's egg.

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1. The specimens were demonstrated to the class and then drawn. During my absence in Europe they were unfortunately mislaid and have not yet been located; consequently I have thus far been unable to make a careful histologic examination to determine definitely whether the central portion of the cartilaginous masses contained bone or not.





Fig. 3.—Cartilaginous masses lying free in a cystic tumor developing from the iliopectus bursa (natural size). These masses were pearly white, very irregular, but perfectly smooth. They were rather lighter in weight than bone. Their general arrangement in the cyst is shown in Fig. 1.

According to Joessel<sup>2</sup> the iliopsoas bursa or the bursa mucosa subiliaca lies between the partly tendinous portion of the iliac muscle and the front of the iliopectineal eminence. Anteriorly, it is firmly attached to the iliopsoas muscle, posteriorly to the iliopectineal eminence, and likewise to the thin portion of the capsule of the hip-joint.<sup>3</sup> It is bounded on the outer side by the iliofemoral ligament, below by the pubofemoral ligament and on the inner side by the cotyloid ligament.

Joessel further finds that occasionally the fibrous capsule at the thin point of the joint is wanting and then nothing but the synovial membrane separates the joint from the bursa. Occasionally the synovial membrane is lacking at the thin point and in these cases there is a direct communication between the hip-joint and the bursa. This opening explains how purulent accumulations of the joint may extend to the iliopsoas bursa and then appear under the iliopsoas muscle and also how psoas abscesses may travel down the muscle and eventually cause involvement of the hip-joint. An extended consideration of the subject would necessitate a discussion of practically all diseases of the hip and would naturally lead us too far afield. I shall consequently limit my remarks chiefly to those cases in which cystic tumors similar to this have been noted and in which little or no evidence of inflammation has existed.

When consulting the literature I found a most instructive and painstaking article on "Diseases of the Bursae of the Hip" by R. Zuelzer.<sup>4</sup> I have examined in the original the references given by this author and have found them in the main so well epitomized that I shall draw largely on his descriptions and conclusions.

It has been noted that the bursae that are regularly found are usually developed during fetal life, while the less constant ones appear at a later date. Virchow and Schuchardt found that the small subcutaneous bursae developed out of a connective-tissue network resembling cavernous tissue. Eventually a cavity was formed in which as a result of the continuous movements and rubbing the connective tissue gradually atrophied. The walls of these bursae consist of dense connective tissue

2. *Topographisch-Chirurgische Anatomie*, 1, 169.

3. This thin spot is well seen in Figure 232 of Cunningham's *Anatomy*, 1909, p. 296.

4. *Deutsch. Ztschr. f. Chir.*, 1899, L, 148.

and contain a very little elastic tissue. The inner surface is lined with one layer of so-called endothelium and the contents of the bursa resemble those of the joint. They are slightly tenacious, thick and usually just enough in amount to keep the walls of the sac smooth.<sup>5</sup>

CASES OF CYSTIC DEVELOPMENT OF THE ILIOPSOAS BURSA AS COLLECTED BY ZUELZER

**HOFFA:** The patient, a workman, was struck on the right foot and the left arm. He walked home at once a distance of about two miles, remained without treatment for fourteen days and again went to work. A year later he complained of pain in the region of the right hip. On examination the leg was found slightly flexed, abducted and rotated outward. At the hip was a painful tumor which was clearly visible and palpable; it lay under Poupart's ligament between the psoas and the pectineus muscles and was of the consistence of bone. On flexion of the leg, however, fluctuation could be detected. The trochanter was in its normal position and movements of the hip-joint were easily made. Adduction, flexion and rotation inward were, however, somewhat limited. The pain extended down to the knee. The corresponding leg was somewhat thinner than the other. This case was diagnosed by a colleague as an impacted fracture of the neck of the femur and the tumor was thought to be a callus formation pressing on the crural nerve and causing pain. There was no shortening of the leg.

**EHRLE:** A cooper, aged 33, for thirteen years had suffered with pain in the leg and down its inner side. Four months before coming under observation he noticed a tumor situated slightly below Poupart's ligament. This was ovoid in shape and lay under the large vessels. On extension of the leg the tumor became hard. On flexion fluid could be detected. Extension and rotation outward produced pain. By flexion it was clearly seen that the psoas muscle was lifted up. The hip-joint was free.

**HERDMANN:** The patient had been squeezed between two cars, the chief pressure coming on the left hip. The patient was carefully watched as he was supposed to be a malingerer. On examination, however, a painful swelling of the bursa beneath the tendon of the iliopsoas muscle was found. Flexion of the leg or rotation inward caused much pain in the joint.

**MOMMSEN:** This surgeon saw a patient who had an elevated, clearly fluctuating painless tumor which projected from the region of the iliopsoas muscle and passed out beneath Pou-

5. Those interested in the development of bursæ should not fail to read the excellent paper on *Luetic Bursopathy of Verneuil* by Dr. John W. Churchman, Resident Surgeon in the Johns Hopkins Hospital (The Am. Jour. of the Med. Sc., September, 1909).

part's ligament. It lifted up the femoral artery. On pressure the tumor diminished in size.

MOMMSEN: The same author reported a case of a man 50 years old who without apparent trauma complained of difficulty in walking on account of a gradually increasing swelling in the right inguinal region. The tumor was as large as two fists and was situated deep in the right iliac fossa. It was firm in consistency and only slightly movable. It was thought to be a sarcoma of the fascia of the hip. At operation its lower pole was found firmly attached to the joint capsule. The cyst walls varied from 3 to 5 mm. in thickness and the failure to detect fluctuation was due to over-distention of the cyst.

SCHÄFER: The patient, a man coming to Volkmann's clinic, complained of a tumor the size of a child's head situated at the flexion of the thigh and lying under Poupert's ligament. The man had fallen and injured his hip a year and a half before. The tumor projected only slightly above the normal skin surface. It was buried deeply in the muscle of the thigh, was elongate oval and followed the long axis of the psoas muscle. The thigh was markedly flexed. When the leg was extended the tissue was of stony hardness. With extensive flexion some fluctuation could be detected. A second tumor the size of an apple was present at the edge of the gluteus maximus. This tumor also on extension was tense, but on flexion of the hip it became softer. Its contents could be made to disappear and as a result the anterior tumor became more distended. The cystic tumors communicated with one another. The movement of the hip joint was free. The pain radiated from the hip to the knee.

FRICKE: This author described a case of a carter who without apparent cause had a tumor in the hip region. It lay over the right trochanter and passed inward under Poupert's ligament and extended downward over the upper third of the thigh. It really formed three tumors. The outer portion was as large as a child's head and markedly distended. The second lay on the inner side of the thigh and the third, the smallest, lay between them. All three fluctuated and the fluid could be pressed from one tumor into the other. The position of the thigh was normal but movement of the hip was impossible on account of the severe pain which was caused especially by flexion and rotation. The tumor itself was not painful on pressure but pain was reflected down to the knee.

HEINEKE: This author observed a case in the Greifswald clinic in which after a rheumatic inflammation of the hip-joint a prominent and distinctly fluctuating tumor developed. This followed the direction of the iliopsoas muscle from Poupert's ligament downward and raised up the femoral artery. On pressure the tumor diminished but on removal of the pressure the tumor again became prominent. Passive motion of the hip-joint was free and painless. In this case there was accumula-

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tion of fluid in the iliac bursa and this communicated with the hip-joint which also contained an excess of fluid.

Wood<sup>6</sup> reported a case in a thin man 28 years old, who two years previously, while convalescing from typhoid fever, had sprained his left hip. Walking was associated with severe pain. Six weeks later he noticed a swelling in this region. There was swelling both in front of and behind the hip and fluctuation was definite. A diagnosis of gluteal abscess was made. The patient, on account of well-marked contraction of the iliopsoas muscle, was unable to extend the leg. The tumor ruptured and there was a spontaneous expulsion of particles of bone as large as beans. The hip-joint was freely movable and not painful. This is one of the very few cases in which the bursa contained foreign bodies.

COUTEAUD: This patient was a man, aged 31, who was very strong and had done heavy work. Six years previously he had had syphilis. In the left inguinal region and on the inner side of the thigh was a prominent tumor the size of an egg. This was smooth, rounded, painless and could not be made to disappear. The skin over it was freely movable. On examination fluid could be detected in the pelvis and this fluctuation communicated with the tumor. The hip joint was normal. The tumor was punctured and clear citron yellow slightly tenacious fluid came away. In this case the chief pain was in the region of the knee.

Since Zuelzer's paper several cases have been recorded. The most interesting one is that of DELBET.<sup>7</sup> This surgeon gives a very short account of a case in which he diagnosed a cystic tumor of the iliopsoas bursa (a hygroma) before operation. On opening the sac he found three foreign bodies each of which was the size of a large nut.

#### DIAGNOSIS

In summing up his article Zuelzer points out that these tumors may be of various sizes and that the swelling indicates primarily the anatomic position of the subiliac bursa. As the tumor increases it may extend far below Poupart's ligament, sometimes reaching to the middle of the thigh. It may consist of one tumor or be made up of several. It may spread out on either side of the iliopsoas muscle or extend in various directions, and may communicate with the joint. When more than one tumor

6. This is the only case of Zuelzer's that I could not confirm, as the reference is incorrect and consequently I have not been able to obtain Wood's original article. I was unable to trace the case either in the *Index Medicus* or the *Index Catalogue* of the Surgeon-General's Library.

7. Corps étranger contenu dans un hygroma de la bourse du psoas. Bull. et. mém. Soc. de chir. de Paris, 1902, xxviii, 1264.

exists it is often possible to press the fluid from one tumor into another. On releasing the pressure the fluid at once comes back. The tumor may extend forward beneath Poupart's ligament and then backward along the course of the iliopsoas muscle as in our case.

In some cases fluctuation can be detected, but in others the tension is so marked or the cyst walls so thick that the tumor is supposed to be solid.

The skin is, as a rule, freely movable over these tumors provided inflammatory conditions are absent. Many of the tumors are painless, but when one remembers that the growth develops beneath the crural nerve and puts it on marked tension as in the case reported, it is but natural that any excessive movement of the hip-joint should be accompanied not only by local pain but also by pain referred to the knee.

Zuelzer found that the typical position of the leg in these cases is in abduction, outer rotation and slight flexion of hip. In this position there is naturally a minimum tension on crural nerve and iliopsoas muscle.

In these cases the hip-joint is, as a rule, perfectly normal, the great trochanter bears its normal relation and there is no shortening of the leg. In this way it is possible to exclude completely fracture of the neck of the femur, fluctuations and diseases of the hip. In my case there was three-quarters of an inch shortening. The joint itself was perfectly normal.

#### ETIOLOGY

The majority of these cases have followed some injury, although syphilis and rheumatism are also supposed to be contributing factors. In my case the connective-tissue walls of the cyst contained bone. This should occasion no surprise as this fibrous tissue is similar to and continuous with that forming the joint. The presence of large free foreign bodies in the sac is most unusual, but when we remember that small free cartilaginous bodies are not infrequently found in the knee-joint, it should not appear strange that a sac communicating with the hip-joint might contain similar products. The foreign bodies in the case reported, however, were exceptionally large.

## TREATMENT

In times past, local applications were sometimes made; at a later date some of the tumors were aspirated, but the fluid tended to return. In cases similar to mine complete removal of the sac is the only satisfactory solution of the problem. Here it was necessary not only to get rid of the secreting surface, but also to remove the large free foreign bodies. Under no circumstances should irritants be injected into the sac as was formerly done. The surgeon cannot, as a rule, determine definitely before operation whether these bursæ communicate with the joint or not. The results from operative treatment should be most satisfactory.

Monroe's beautiful atlas containing a description of all the "Bursæ Mucosæ" of the human body, published in Edinburgh in 1788, should be read by every surgeon. It will undoubtedly stimulate increased study of this subject and materially help to clear up many imperfectly understood conditions originating in the bursæ in various parts of the body.

3 West Preston Street.

A RIGHT PELVIC KIDNEY. ABSENCE OF THE LEFT KIDNEY;  
ABSENCE OF THE UTERUS; BOTH OVARIES IN  
THE INGUINAL CANALS

By THOMAS S. CULLEN, M. B., Baltimore, Maryland

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*July, 1910, pages 73-75*



## A RIGHT PELVIC KIDNEY. ABSENCE OF THE LEFT KIDNEY; ABSENCE OF THE UTERUS; BOTH OVARIES IN THE INGUINAL CANALS<sup>1</sup>

By THOMAS S. CULLEN, M. B., BALTIMORE, MARYLAND

C. H. L., 1677. O. C. J., aged 17, single, white, admitted to the Church Home and Infirmary, March 5, 1907. The patient has been under the care of Dr. Paul Jones of Snow Hill for some time. She had been thought to have an imperforate hymen and a double inguinal hernia. She had always been somewhat delicate and nervous.

Five years before a left inguinal hernia had been noted, which annoyed the patient considerably. Three years later a hernia made its appearance on the right side. The hernial protrusion on the right was larger in dimension than that on the left, at times reaching 9 to 10 cm. in diameter. On one occasion it had become temporarily incarcerated, and she had been wearing a truss on the right side. The patient had never menstruated, but nearly every month she had had hot flushes and had been very dizzy. The flushes would persist for two or three days at a time. She had no definite headache, but her head had felt "big and queer." There had never been any vomiting, but nausea had been noted at these times and a burning sensation in the region of the stomach. The patient entered the hospital seeking relief for her inability to menstruate. The menstrual symptoms had commenced three and half years before. The urine was found to be normal.

**Examination under anesthesia.** The breasts were not well developed for a girl of her age. The pubic hair was normal. On pelvic examination a small urethral orifice was found. This readily admitted the catheter and the bladder was at once emptied. There was absolutely no evidence of a vagina apart from a slight depression 1 mm. in depth (Fig. 1). On rectal examination we found a large oval mass which appeared to be slightly cystic. This filled the right side of the pelvis and was thought to be either the enlarged uterus or a dilated vagina.

**Operation.** I passed four guy sutures at the point where the vagina would naturally have been and then made a transverse incision 1.5 cm. anterior to the rectum. In my dissection I kept close to the rectum, one finger in the bowel serving as a guide and a pair of forceps introduced into the bladder serving to outline this organ when necessary. Finally I was able to separate the bladder from the rectum for a distance of five inches, although the septum between the bladder and rectum was not over 2 to 3 mm. in thickness. I then encountered the firm mass which had been detected in the right side of the pelvis. On making firm pressure from above the mass could be felt directly under the finger introduced into the wound. We expected to find fluid, but the growth seemed to be solid or semifluctuant. We at once realized that an unusual condition existed and an abdominal section was decided upon as the wiser procedure.



Fig. 1. Absence of the vagina. The urethral orifice is normal. Beneath it is a small pit, the only remnant of the vagina.

On making an abdominal incision we first encountered the fimbriated end of the right tube (Fig. 2). This could be seen and followed for 1.5 cm. The remaining portion lay in the hernial sac on the right side. After slitting the sac slightly and examining the extra-peritoneal portion I was able to detect the remaining portion of the tube. In the inguinal sac lay also the right ovary, which was perfectly normal. The ovarian vessels came from the usual source. The utero-ovarian vessels passed down into the right inguinal canal as did the tube. The right round ligament emerged from the canal, formed a loop on itself and re-entered the canal.

<sup>1</sup> Read before the American Gynecological Society, Washington, D. C., May 3, 1910.

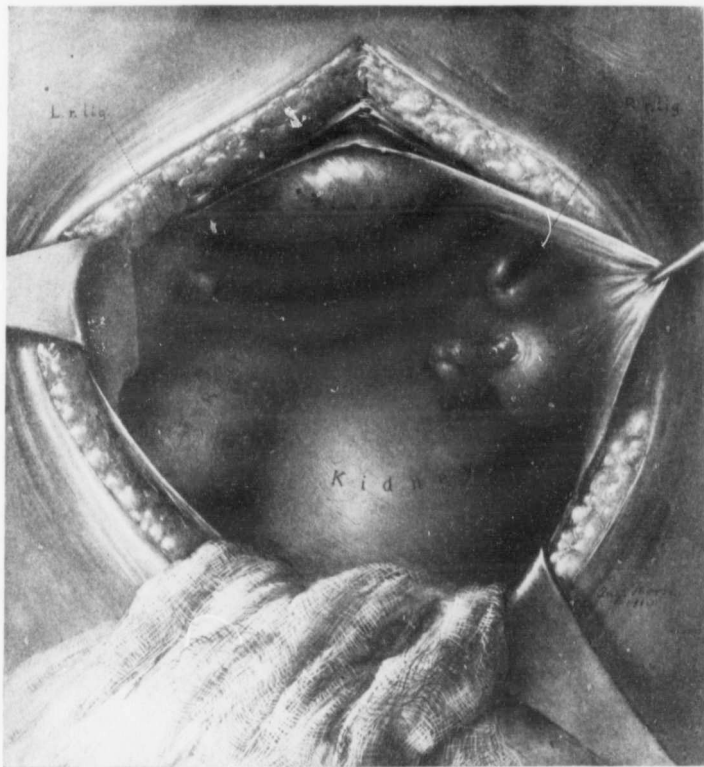


FIG. 2. A right pelvic kidney. The kidney is seen from above through the abdominal incision. It fills the right half of the pelvis and extends to the pelvic brim. On the left side the kidney is wanting. There is no uterus. A portion of the right tube is seen emerging from the inguinal ring. The bulging at the inguinal ring is made by the ovary and the remaining portion of the tube both of which are extraperitoneal. The right round ligament emerges from the inguinal canal, forms a loop on itself and then again disappears. The left round ligament is recognized as a little bud. The left tube and ovary were in the inguinal canal.

The firm mass felt in the vagina and thought to be due to an accumulation of retained menstrual flow proved to be solid. It felt like a kidney, the hilus being easily demonstrable on the inner side. It was about half as large

again as a normal kidney and lay extraperitoneally. It almost completely filled the right half of the pelvis. I examined the usual site of the right kidney and found no kidney in this position.

There was no trace whatever of the uterus. The bladder and rectum were the only organs in the pelvis except the kidney.

The left round ligament could be seen peeping out of the inguinal canal for about 5 mm. It could be pulled out much farther. It formed a loop on itself and then disappeared into the inguinal canal. In other words both ends of the round ligament were in the canal.

The left side of the pelvis was perfectly smooth, there being no left tube or ovary visible. The mass in the left inguinal canal was, however, apparently the left ovary.

The left kidney was absent.

We at once closed the abdomen and then brought the tissue between the rectum and the bladder together as far as possible and left in a small drain. The patient did not stand the anesthetic well and was exceedingly blue. Her pulse when she left the table was 106, but full. She rapidly recovered from the effects of the operation, and was discharged in practically the same condition as that in which she entered the hospital.

A case of this character was operated upon by Dr. Polk of New York in 1882. The mass in the pelvis was removed and it proved to be a right pelvic kidney. The patient lived thirteen days and at autopsy Dr. Wm. H. Welch found that this was the only kidney.

We are deeply indebted to Dr. Polk for having reported this case in full and for his timely warning that in all cases in which a pelvic kidney is found careful examination should be made to de-

termine whether the operator is dealing with a case of unilateral kidney.

The advisability of making an artificial vagina has to be considered in these cases. The ingenious operation suggested by Baldwin in which a loop of small gut is disassociated and brought down to form the lining of the new vagina may be tried. This procedure is clearly outlined in *The Journal of the American Medical Association*, April 23, 1910, page 1362. The operation as carried out by Alex. Hugh Ferguson appeals more strongly to me as it is naturally less dangerous. It consists of separating the bladder from the rectum. A U-shaped flap is then taken from the skin between the urethra and the rectum and attached to the bladder which has been well pulled down. When the traction on the bladder is released the bladder retracts and carries the flap well up into the newly formed cavity. The posterior wall is now made by using two flaps consisting of the labia. The rectum is pulled well down and the flaps are attached to it. When the rectum is allowed to recede the flaps are carried far up into the cavity. A plug covered with rubber is now tightly packed into the vagina. Ferguson reports excellent results in three cases in which he has employed this method.

CARCINOMA OF THE RIGHT FALLOPIAN TUBE  
READILY PALPABLE THROUGH  
THE ABDOMEN.

By THOMAS S. CULLEN, M. B.,

*Associate Professor of Gynecology, Johns Hopkins University.*

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Cancer forms a very small percentage of the pathological<sup>[30]</sup> conditions of the Fallopian tube. As pointed out by Hurdon,<sup>1</sup> carcinoma was noted only three times in the tube, as compared with some four hundred cases of cancer of the uterus that came under our observation in the Johns Hopkins Hospital. Among the more important American articles on this subject are those of LeCount<sup>2</sup> and Hurdon.<sup>3</sup> In the Johns Hopkins Bulletin of 1905, Vol. XVI, p. 399, I reported a case of adenocarcinoma of the tube in which as a result of extensive involvement of the pelvic peritoneum and of the surrounding tissues I found it necessary to remove not only the entire uterus with the adnexa but also several inches of the sigmoid flexure and about one-third of the pelvic peritoneum.

Alban Doran,<sup>4</sup> of London, has given a complete survey of the literature and collected in all sixty-two cases. A further admirable monograph on the same subject by the same author<sup>5</sup> appeared a few months ago. In this the number of cases of carcinoma of the tube had been increased to one hundred.

<sup>1</sup> Elizabeth Hurdon, Kelly, H. A., and Noble, C. P. *Gynecology and Abdominal Surgery*, Phila., 1907-08, I, 175.

<sup>2</sup> LeCount. *Johns Hopkins Hosp. Bull.*, 1901, Vol. XII, p. 55.

<sup>3</sup> Elizabeth Hurdon. *Johns Hopkins Hosp. Bull.*, 1901, Vol. XII, p. 315.

<sup>4</sup> Alban Doran. *J. Obst. & Gynec. Brit. Emp., Lond.*, 1904, VI, 285.

<sup>5</sup> Alban Doran. *J. Obst. & Gynec. Brit. Emp., Lond.*, 1910, XVII, 1.

- [20] After such thorough presentations of the subjects as have been furnished by these authorities a further survey of the literature would be simply a repetition and I shall merely report a case which came under my observation in the laboratory. Its chief interest lies in the large size of the growth. When I first saw the hardened specimen before learning the clinical history, I considered it to be a very large hydrosalpinx or pyosalpinx. On section, however, its true character was readily discernible.

*Adeno-carcinoma of the right Fallopian Tube, extension to left Fallopian Tube; very small uterus.*

*San. No. 2453.*—Mrs. M. H., aged 46. Admitted to Dr. Kelly's private sanitarium on May 14, 1907. The patient entered complaining of a mass and great pain in the lower part of the abdomen. The family and past history were negative.

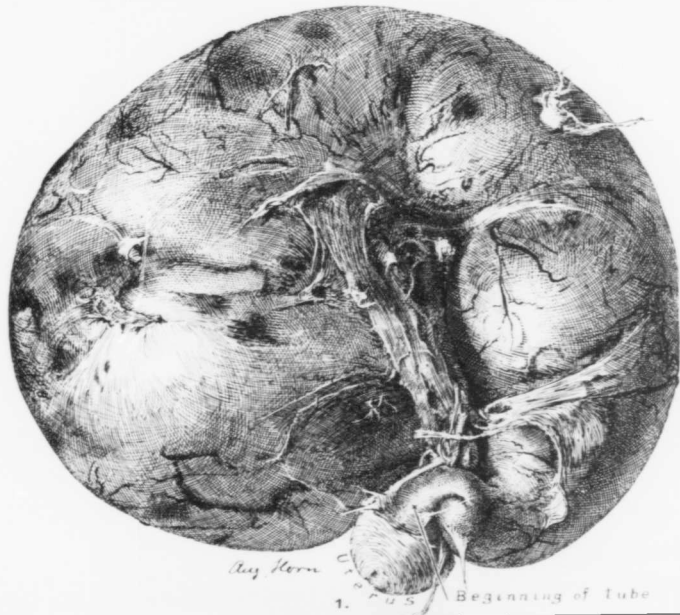
The menses began at 14, were regular, moderate in amount, somewhat painful and usually lasted four days. For the last two or three months the periods have been irregular but profuse. She had one miscarriage when 18. Recently there has been a profuse leucorrhœal discharge which, for the past year, has been associated with some odor and with blood.

*Present illness.*—Two years ago the patient first had what she called an attack of appendicitis. The pain was located in the right iliac fossa and was severe and cramp-like in character. It has persisted in this region and for the last year has also been present in the left side. The pain radiates into the leg and for the last four or five months both legs have been swollen.

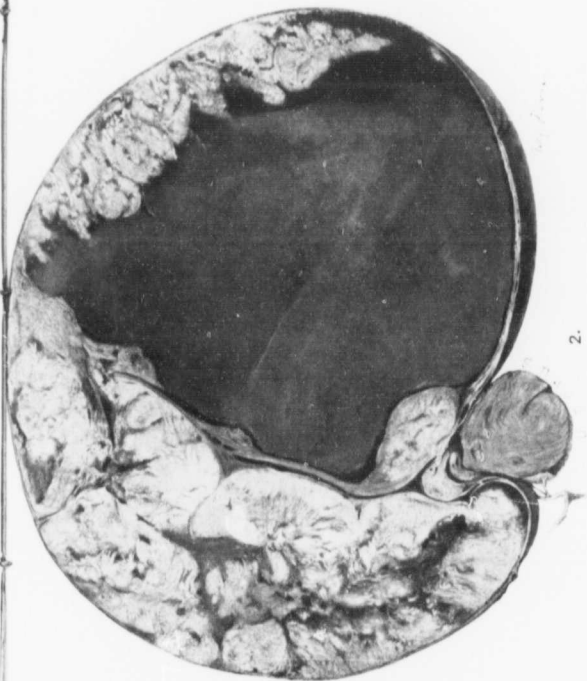
*Operation.*—The uterus was removed by bissection; a small piece of intestine was also removed on account of a little sub-peritoneal cyst which was supposed to be secondary to the tubal growth. There was no glandular involvement and no evidence of any peritoneal implantation.

*Path. No. 11536.* The specimen consists of a small uterus, of a greatly enlarged right Fallopian tube and of an enlarged left Fallopian tube.

The body of the uterus is 4 cm. long and about 4 cm. broad. It is markedly atrophied. The right tube at the uterus is about 7 mm. in diameter, but after passing outward 1 cm. it curves on itself, becomes markedly convoluted and 5 cm. from the uterus is 5 cm. in diameter. It continues to increase in size until at its outer end it is 10 cm. in diameter. Roughly it forms a sausage-like tumor 14 cm. long, 12 cm. broad, and about 10 cm. in thickness. Anteriorly it is covered with adhesions. Posteriorly it is perfectly smooth and springing from its surface is a sub-



1. Beginning of tube



2.



peritoneal cyst 1.5 cm. in diameter. Large congeries of blood vessels are seen ramifying beneath the peritoneum. [20]

On section it is seen that the great increase in size is due in a large measure to a new growth. This has extended into the lumen of the tube, but at no point does it appear to have reached the outer surface. Where the tube is 5 cm. in diameter the growth completely fills the lumen. It is composed of a granular-looking new growth which presents a somewhat arborescent appearance. The growth apparently springs from all parts of the wall of the tube. Near the fimbriated extremity, where the tube is 10 cm. in diameter, for over fully half of its extent the walls are covered with a new growth. This in places reaches 2 cm. in thickness. At other points the tube seems to be free from the growth. The entire central portion of the tube has been filled with fluid that has undergone coagulation in the hardening fluid. In the fluid next the growth here and there are large blood clots. The gross picture leaves little doubt that we are dealing with a malignant growth. If it be malignant the reason why it has not extended outside seems evident, because the point of least resistance would be toward the center of the tube.

The left tube, near the uterus, is 5 mm. in diameter, but on passing outward a short distance it is dilated to 4 or 5 cm. It likewise on section is found to be the seat of a similar growth. The tube is covered with adhesions. [21]

*Histological Examination.*—Sections from the growth of the right tube show in some areas little tree-like or teat-like projections extending into the cavity. They remind one very much of the small folds noted where a hydrosalpinx exists. At other points the epithelium has proliferated forming gland-like areas. In more advanced portions over wide areas papillary outgrowths are seen. These present a distinct arborescent appearance and the projections are covered with one or several layers of very high, exceedingly regular cylindrical epithelium. Over large areas there is not the slightest evidence of breaking down. In still other portions of the growth one sees nuclei two or three times the usual size. These stain somewhat deeply. In other portions cross and longitudinal sections of finger-like processes with large blood vessels in their interior are seen. Here and there the epithelium proliferated until solid masses of glands have been formed. Masses of epithelium without evidence of gland formation are also noted. In only a few places is there evidence of breaking down.

The growth is, without doubt, a carcinoma, but is characterized by a marked tendency toward gland formation and papillary outgrowths, and by its stability instead of its tendency toward breaking down. One might, with some propriety, claim that it re-

[21] sibles, to a marked degree, a very cellular and branching papilloma.

It is interesting to note that the other tube presents a similar appearance. One tube may have picked the carcinoma up from the other. The tube walls themselves are not over 1 mm. in thickness. We did not receive the ovaries or the small nodule from the bowel for examination.

We find no record of any other carcinomatous tube that has reached such large proportions.

*Post-Operative History.*—Sept. 30, 1910. Dr. Curtis F. Burnam kindly made inquiry concerning the patient and finds that there is at present a marked recurrence of the growth, there being a large palpable abdominal mass. The patient, however, is able to do her work most of the time and her general health has been but little affected.

The growth has evidently been a rather slow one as it is nearly three years and a half since operation.

#### DESCRIPTION OF FIGURES.

FIG. 1.—Primary Carcinoma of the Fallopian Tube. (Natural size.)

The small uterus has been bisected and one-half is seen in the lower part of the picture. The tube at the cornu is small, but after passing outward a short distance rapidly increases in size. Its outer end is so much distended that it might readily be mistaken for an ovarian cyst. The surface of the tube is covered by numerous adhesions and its vessels are large and tortuous. The interior of the tube is shown in Fig. 2.

FIG. 2.—Primary Carcinoma of the Fallopian Tube. (Natural size.)

For the general contour see Fig. 1. In the lower part of the picture is a cross section of half of a bisected uterus. The great increase in size of the tube is in a large measure due to a friable, stringy growth which almost completely fills the lumen. The great distension of the outer end of the tube has been caused by an accumulation of serous fluid which has coagulated in the hardening fluid. This coagulum is seen retracting from the tube wall and could readily be lifted out of the tube in one piece. It will be noted that where the tube is so much dilated its walls over a considerable area are totally devoid of new growth.

# SURGICAL DISEASES OF THE UMBILICUS

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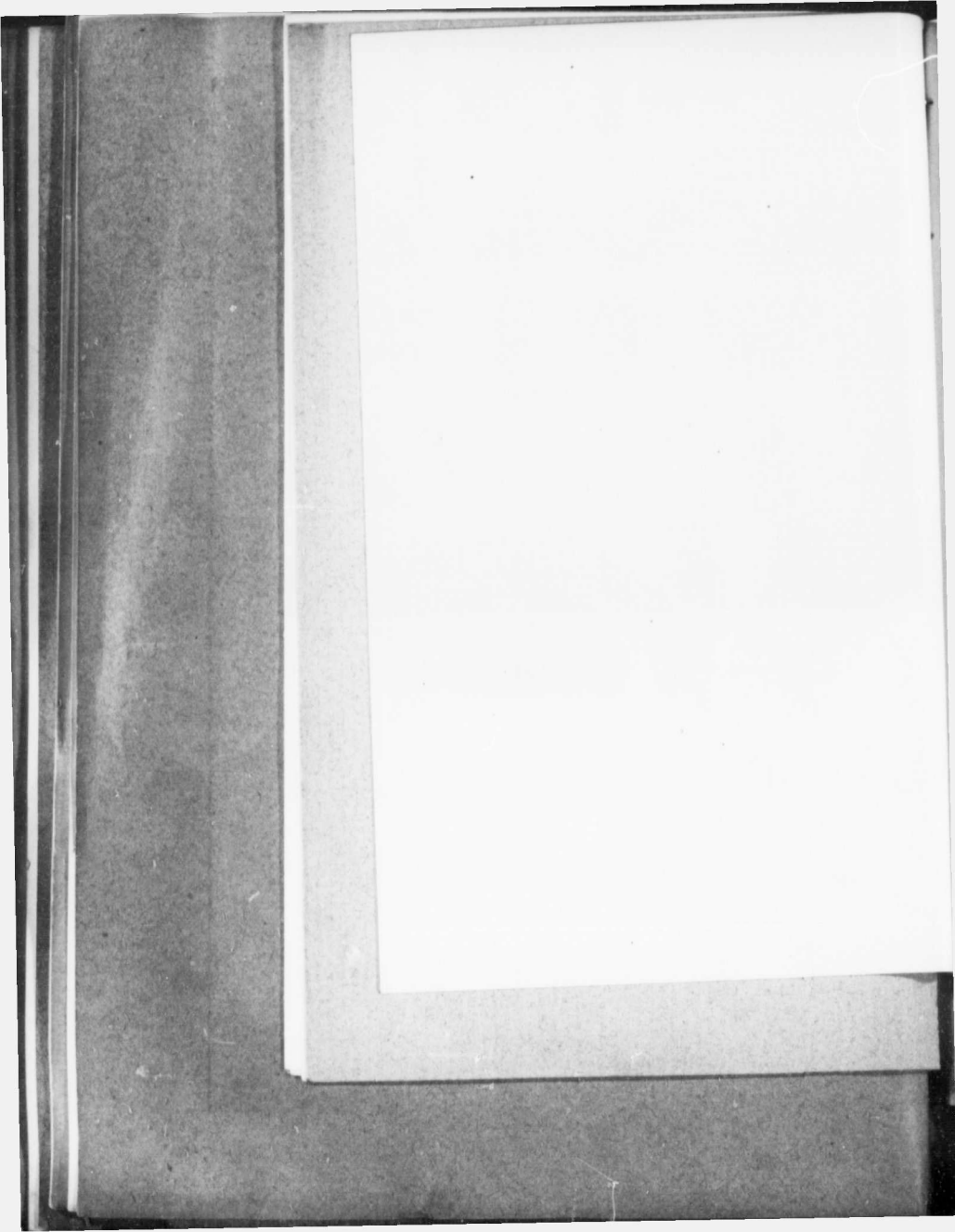
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AMERICAN MEDICAL ASSOCIATION  
FIVE HUNDRED AND THIRTY-FIVE DEARBORN AVENUE  
CHICAGO

Surgical Diseases of the Umbilicus

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BALTIMORE



## SURGICAL DISEASES OF THE UMBILICUS \*

THOMAS S. CULLEN, M.D.  
BALTIMORE

In the summer of 1904 I removed from a man 42 years of age an umbilical growth which on histologic examination was found to be an adenocarcinoma. Being at a loss to account for a glandular growth at the umbilicus, and at the time being unfamiliar with the fact that cancers of some of the abdominal organs sometimes give rise to metastases at the umbilicus, I started to review the literature of diseases of the umbilicus. It was my intention to present to the Section a digest of these studies, but, notwithstanding the fact that few surgeons have observed more than one or two pathologic conditions of the umbilicus, I found that the sum total gives such an abundant and varied material that to do the subject justice and to consider it carefully from all standpoints would require several hours.

Undoubtedly one of the best articles on the umbilicus is that by Reginald Fitz,<sup>1</sup> published in 1884. Other valuable contributions have also been published by Freer<sup>2</sup> and by Morris.<sup>3</sup>

The French have dealt with the subject in a most exhaustive manner, and especially good articles have been published by Villar,<sup>4</sup> Lannelongue and Frémont,<sup>5</sup>

\* Read in the Section on Surgery of the American Medical Association, at the Sixty-First Annual Session, at St. Louis, June, 1910.

1. Fitz, Reginald: Persistent Omphaloenteric Hernias: Their Importance in the Causation of Intestinal Duplication, Cystoformation and Obstruction. *Am. Jour. Med. Sc.*, 1884, lxxviii, 39.

2. Freer, James A.: Abnormalities of the Utrachus. *Ann. Surg.*, 1887, v, 107.

3. Morris: Malignant Diseases of the Navel as a Secondary Complication. *Ann. Surg.*, 1892, xv, 326.

4. Villar: Tumeurs de l'ombilic. Thèse de Paris, 1886.

5. Lannelongue and Frémont: De quelques variétés de tumeurs congénitales de l'ombilic et plus spécialement des tumeurs adénoïdes diverticulaires. *Arch. gén. de méd.*, 1884, Siegenbeek 7, xlii, p. 36.

and by Quénu and Longuet.<sup>6</sup> In the German literature the articles of Kolaczek,<sup>7</sup> Küster,<sup>8</sup> Hertz,<sup>9</sup> Ledderhose,<sup>10</sup> Tillmanns,<sup>11</sup> Pernice,<sup>12</sup> Siegenbeek van Heukelom<sup>13</sup> and Schroeder<sup>14</sup> stand out prominently.

On this occasion, then, I shall limit myself to the consideration of pathologic pictures due to partial or total lack of closure of the omphalomesenteric duct and to primary and secondary cancer of the umbilicus.

#### NON-MALIGNANT ABNORMALITIES OF THE UMBILICUS

*Adenoma of the Umbilicus.*—Occasionally when the cord comes away a small red, pedunculated nodule is found springing from the umbilical depression. This nodule may be the size of a pea, a small cherry or a red raspberry. It is bright red in color, has a velvety surface, secretes a small amount of mucus and is attached to the umbilical depression by a delicate pedicle. On pressure this small nodule is firm and velvety. On histologic examination the outer surface is found to be covered with mucosa identical with that lining the small intestine. There is an outer covering of cylindrical epithelium, and then come the typical Lieberkühn glands with the intervening stroma. Beneath the mucosa is a certain amount of fibrous tissue and the center is composed of non-striped muscle fibers.

*Funnel-shaped Umbilicus.*—Sometimes after the cord comes away the nurse notices that the umbilicus is somewhat moist and on investigation the umbilical depression is found to be deeper than usual. The outer portion is covered with normal skin, the deeper portion of the funnel has a reddish, velvety lining and partially

6. Quénu and Longuet: Du cancer secondaire de l'ombilic. Rev. de chir., 1896, xvi, 97.

7. Kolaczek: Zwei Entero-Teratome des Nabels, Arch. f. Klin. Chir. (Langenbeck's), 1875, xviii, 349.

8. Küster: Die Neubildungen am Nabel erwachsene und ihre operative Behandlung, Arch. f. Klin. Chir., (Langenbeck's), 1874, xvi, 234.

9. Hertz: Ueber einen Fall von Adenocarcinom des Nabels bei einer 58-jährigen Frau, Inaug. Diss., Würzburg, 1905.

10. Ledderhose: Chirurgische Erkrankungen des Nabels, Deutsche Chirurgie, 1890, Instalment 45 b.

11. Tillmanns: Ueber angeborenen Prolaps von Magenschleimhaut durch den Nabelring (Ectopia ventriculi) und über sonstige Geschwülste und Fisteln des Nabels, Deutsch. Ztschr. f. Chir., 1882-1883, xviii, 161.

12. Pernice: Die Nabelgeschwülste, Halle, 1892.

13. Siegenbeek van Heukelom: Die Genese der Ectopia ventriculi am Nabel, Virchows Arch. f. path. Anat., 1888, xli, 475.

14. Schroeder: Ueber die Divertikel-Bildungen am Darm-Kanale, Inaug. Diss., Augsburg, 1855.

filling the cavity is a transparent, slightly tenacious mucus. Sections from the red lining show that it consists of a mucosa identical with that of the intestine and that it has an outer coat of non-stripped muscle fibers.

*Cystic Cavities in the Abdominal Wall at the Umbilicus.*—In a few cases there was noted a slight watery discharge from the umbilicus and on examination a small fistulous opening was detected leading directly inward for from one to several centimeters. These cavities were partially filled with mucus, and were lined with

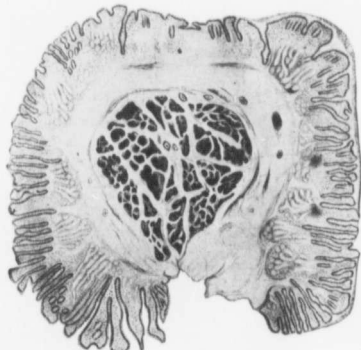


Fig. 1.—Adenoma of the umbilicus. The specimen represents a transverse section through a so-called adenoma of the umbilicus. The central stem is made up of non-stripped muscle fibers cut transversely. Surrounding this is a zone of fibrous tissue and the outer surface is covered by a mucosa consisting essentially of glands of the small intestine. (Lameloigne and Fremont: Arch. gen. de med., 1884, clix, 62.)

a velvety membrane which proved to be intestinal mucosa. These cystic spaces may lie external to or beneath the aponeurosis and in at least one instance the cystic cavity had no connection with the outside.

*Meckel's Diverticulum.*—As is well known, Meckel's diverticulum, when present, usually projects from the convex surface of the ileum a few inches from the ileo-



cecal valve and represents a portion of the omphalomesenteric duct which has never closed. It may or may not have a mesentery. Its tip may be free or attached to the umbilicus by delicate threads—remnants of the omphalomesenteric arteries and veins or of the outer portion of the omphalomesenteric duct which has not totally disappeared. Meckel's diverticulum may extend up to and be firmly attached to the peritoneum at the umbilicus.

*Intestinal Cysts.*—Intestinal cysts occasionally occur. Meckel's diverticulum may be nipped off and form a closed sac lined with intestinal mucosa having muscular walls and an outer peritoneal surface. Several such cases are on record. These cysts usually contain nothing but mucus, indicating that they have been cut off at an early period, at a time when no meconium is present in the intestine.

*Pate of Omphalomesenteric Duct.*—A large number of cases belonging to this class have been reported. In some the cord is of unusual size at the umbilicus and shortly after it has dropped off a red mass is found. This is sometimes very small; in other cases one centimeter or more in diameter. It usually projects about 1 cm. from the surface, but in some cases is fully 4 cm. long. In the center is a depression into which a sound can be passed for several centimeters. At first only mucus escapes, but later more or less fecal matter. Where the opening is small and a projection is scarcely noticeable only a faint moisture may be noted.

In several cases in which this very small opening large existed numbers of roundworms and occasionally a tapeworm have escaped through the fistulous tract.

*Prolapsus and Invagination of the Small Bowel Through the Omphalomesenteric Duct.*—If the fistulous opening be large, serious consequences usually follow. When the cord comes away a red nodule at the umbilicus is noted and fluid escapes. Fecal matter is usually passed through the rectum. In the course of a few days, when the child cries or strains, the umbilical picture changes and a little dome-like elevation is seen in the fistulous tract and in a short time a sausage-like mass several inches in length may be seen literally rolling out of the abdomen. This represents the small bowel which is being turned inside out through the fistulous opening. At either end of this sausage-like mass one finds a

lumen, the upper and lower ends of the prolapsed part of the bowel. If one were able to put a hand into the abdomen the minute the bowel begins to invert and make gentle traction, the bowel would at once turn in and become straight, with the fistulous tract passing off at right angles and ending at the umbilicus. As one may surmise, fecal matter comes from the upper end of the prolapsed bowel, nothing but mucus from the lower end and sometimes mucus and possibly a little blood

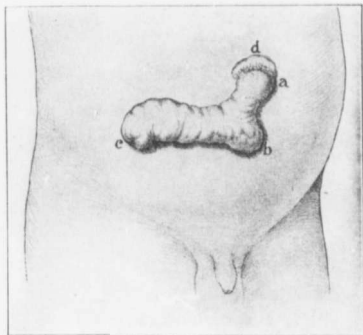


Fig. 2.—Inversion of the patent Meckel's diverticulum and its complication with intestinal prolapsus. A tumor was noticed at the umbilicus as soon as the cord came away. Through this opening fecal matter escaped. There were also normal stools by the rectum. This tumor was 1 cm. long, blood-red in color, velvety, and looked like injected intestinal mucosa. It was 1.5 cm. in diameter and a probe passed in 4 cm. Five days later the small tumor had been transformed into the sausage-like mass noted in the figure. Projecting from the umbilical ring was a cylindrical tumor 2.5 cm. long and 1.75 cm. thick. This tumor, *a*, was continuous with the sausage-like cylindrical tumor *b*, *c*. The tumor was dark red and covered over by mucosa which bled easily. Funnel-like openings were present at points *b* and *c*. The opening at *b* passed inward through a canal in the tumor *a* and then was continuous into the abdominal cavity. From the opening at *b* fecal matter escaped. At *d* was a blind projection. The child was observed for several days and as a result of crying more loops of intestine came down. An attempt was made to carry these back into the abdomen and the bowel was injured. From this description it is seen that there was a prolapsus of the inverted intestine. The child died sixty hours after operation. (Arthur Barth: *Deutsch. Ztschr. f. Chir.*, 1887, xxvi, 195.)

from the rectum. The child dies in from one to three days with signs of shock and occasionally of a general peritonitis.

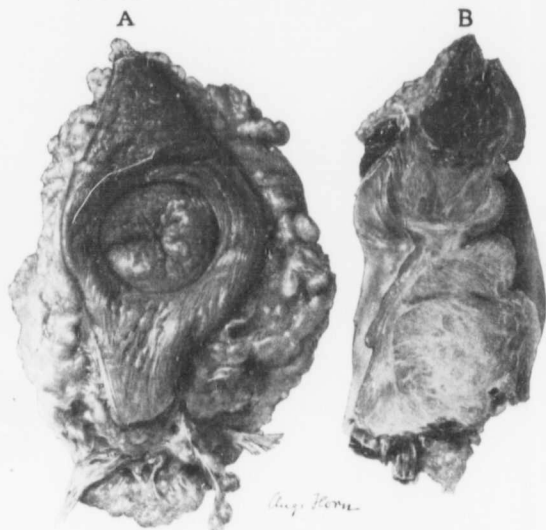


Fig. 3. Secondary carcinoma of the umbilicus. Natural size. (Path. No. 15625. Specimen sent by Dr. Haggard of Nashville, Tenn., April, 1910.) The umbilical fold is much widened and the umbilicus is shallower than usual. It presents a somewhat uneven and nodular appearance, but is everywhere intact. To the right is a longitudinal section through the umbilicus. There is a deep cleft along the skin surface and the umbilical fold is deeper than usual. The fat in the depth has been replaced to a large extent by fibrous tissue, which is everywhere infiltrated by carcinoma. The peritoneal surface, which is to the left, is perfectly smooth; there is not the slightest evidence of any adhesions.

*Origin of Adenoma of the Umbilicus.*—The term "adenoma" is a misnomer, but as the name has been used so long it has been generally accepted. When we remember the funnel-shaped umbilical depression with the in-

is the outer portion of the omphaloenteric duct which has remained open, it is only necessary to realize what may take place when the umbilicus is gradually closing in. This funnel of mucosa may be forced outward and turn inside out. The inner lining of mucosa now becomes the outer surface and the outer muscular wall becomes the center of the pedicle. This is exactly the condition found when these adenoma are present. *Treatment of Remnants of the Omphaloenteric Duct.*—Adenomata may be ligated. If so treated they usually drop off in a few days. They may be ligated and at once cut off. It is always important to ligate, as the pedicle usually contains vessels of great size. In all such cases the parents should be cautioned to watch the child carefully because in a certain percentage of cases the pedicle usually contains vessels of great size. In all such cases the parents should be cautioned to watch the child carefully because in a certain percentage of cases the pedicle usually contains vessels of great size.

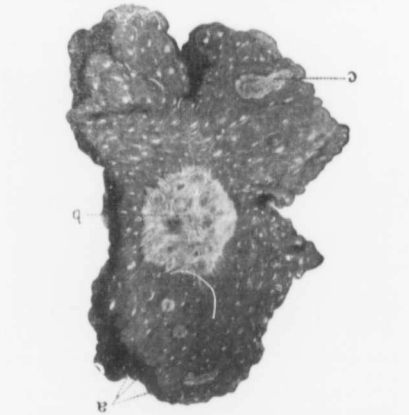


Fig. 4.—The section shows carcinoma of the right inguinal gland which is invading the surrounding tissue; c is also an area of carcinoma. Scattered throughout the adipose tissue are several solid areas b is greatly enlarged, and everywhere infiltrated by carcinoma. Those indicated by a are small lymphatics. The lymphatic gland is greatly enlarged, and everywhere infiltrated by carcinoma.



B

one to three of a general nature. Natural size. gland of Nashville, a somewhat uneven surface and the deep cleft. There is a deep cleft as deep as usual. The peritoneal sac. There is not the

cus.—The term one has been used. When we remember with the in-

these children a Meckel's diverticulum exists and is firmly attached to the umbilicus. If at any time signs of intestinal obstruction develop an exploratory section should at once be performed. Several cases have been reported in which small adenomata existed, attached by a fibrous cord to a Meckel's diverticulum.

Where a funnel-shaped umbilicus is present and the deeper portion is lined with mucosa it seems advisable to make an elliptical incision, removing the entire area and at the same time exploring to see if Meckel's diverticulum is attached to the umbilicus. If so, it should be removed.

In those cases in which a very small fecal fistula is present it may be advisable to wait a few months to see if it will not close. If it is still open at the expiration of six months it should be dissected out down to the ileum and removed. Even should it close the child should be carefully watched for signs of obstruction.

Where the fistulous opening is large it should be removed at once. With the child in good condition the danger is not very great. When prolapsus of the bowel with inversion has occurred, however, as a rule signs of shock have already supervened and the chances of success even with operation are very remote.

#### MALIGNANT GROWTHS OF THE UMBILICUS

These may be divided into four varieties:

1. Primary squamous-cell carcinoma.
2. Primary adenocarcinoma.
3. Sarcoma.
4. Secondary carcinoma.

*Primary Squamous-Cell Carcinoma.*—Cases have been reported. They are very rare and even in the majority of the supposedly authentic cases there is doubt as to the accuracy of the diagnosis. The gross appearance is identical with that of a skin cancer elsewhere. The process seems to be a slow one and on histologic examination the typical appearance of squamous-cell growth is clear.

*Primary Adenocarcinoma of the Umbilicus.*—This appears to be more frequent than that of the squamous-cell type. Here also much confusion exists from the fact that the umbilical growth may be nothing more than a secondary manifestation of a primary growth in one of

the abdominal organs. As has been pointed out in the preceding paragraphs glandular remnants of the omphalomesenteric duct are often present at or near the umbilicus and one would naturally expect that these should occasionally undergo malignant changes.

Bonvoisin<sup>15</sup> observed a case in Tillaux's clinic that seemed without doubt to be a primary umbilical carcinoma. A man, 64 years old, had been ill for two months. At the umbilicus was a brawny excrescence. When the nodule was first noticed it was no larger than a pea. In fifteen days it had ulcerated and the surrounding skin

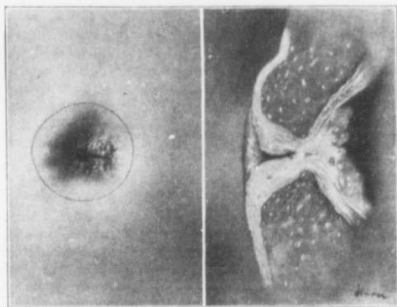


Fig. 5.—Adeno-carcinoma of the umbilicus. The umbilicus looks very much like an inverted carcinomatous nipple. The margins present a fine nodular appearance. The dotted line indicates the limits of the induration. On the right is a longitudinal incision through the umbilicus. There is much thickening due to carcinomatous infiltration. The peritoneum beneath the umbilicus was free from adhesions.

was eczematous. On his admission to the hospital the umbilical zone was replaced by a shallow ulcer with a blackish crust and surrounding this was an inflammatory zone. The entire mass was as large as a five-franc piece and immobile. The nodule was removed but the man died. At autopsy no peritonitis was found and careful examination failed to reveal any primary carcinoma in the abdomen. Ducellier, who examined the

15. Bonvoisin: D'épithélioma de l'ombilic. Thèse, Paris, 1891.

specimen, came to the conclusion that the growth was a primary adenocarcinoma of the umbilicus originating from remains of the omphalomesenteric duct.

*Sarcoma of the Umbilicus.*—Pernice, in his splendid monograph, says that he was able to collect accounts of only six cases. On reading over the reports of these cases, however, one cannot help gathering the impression that most of the growths were in reality fibromata. The evidence of their sarcomatous nature is hardly sufficient to be convincing.

Leydhecker<sup>16</sup> reported the case of a girl of 14, poorly nourished, who had a nodule at the umbilicus. This grew slowly until nine months before operation, when it suddenly became painful and rapidly became larger. At operation the tumor was found to be oval and the size of an orange. It was smooth and slightly pendulous. The skin over the tumor was very thin and bluish-red. Over the lower part of the tumor were ulcerated areas covered with blood and pus. The tumor lay on the superficial fascia. On section it was yellow, homogeneous and resembled pork. Histologically it proved to be a spindle-celled growth. It was probably a sarcoma. The subsequent history was not recorded.

*Secondary Carcinoma of the Umbilicus.*—From a clinical standpoint this is by far the most interesting and important pathologic change that may be encountered at the umbilicus. Without a doubt many members of this Section have had one or more patients come to them complaining of an uncomfortable sensation at the umbilicus. On examination some thickening was detected or possibly a small nodule. There was, however, no evidence of any inflammation and the patient was probably in good health.

Such patients frequently give a history of having had a blow on the abdomen or a sudden abdominal strain a few months before this thickening was noted. If a careful history be elicited, we shall learn that for several months they have had some indigestion or a little vomiting, although in some cases these symptoms may be entirely wanting. In other cases the umbilical discomfort was the first thing that in any way inconvenienced the patient. Shortly after the nodule is detected signs of indigestion usually manifest themselves, and the pa-

16. Leydhecker: Zur Diagnose der sarcomatösen Geschwülste, Giessen, 1856.

tient loses weight and dies. The diagnosis may still be in doubt, but an autopsy will usually reveal a carcinoma of the stomach, which in many of the cases has been latent, and which occasionally has given rise to no local manifestations whatever.

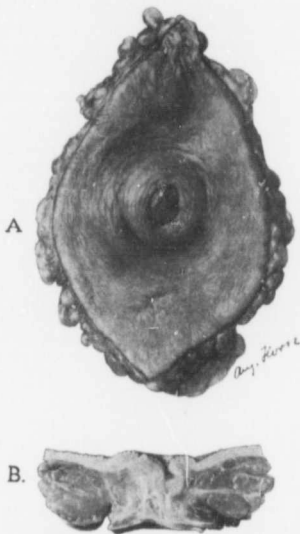


Fig. 6.—Appearance of the carcinomatous umbilicus after removal. Natural size. Path. No. 14968. A. The parts are slightly distorted from the action of the hardening fluid and the umbilicus comes out more prominently than it really did in the patient. There is, however, a slight unfolding of the umbilicus and one part seems somewhat raised. The umbilicus itself, however, was perfectly intact. B. A transverse section through the umbilicus. The half to the left is more prominent and represents the elevation noted in the umbilical depression. The surface, however, is intact. There is an increase in the amount of connective tissue, but no evidence of any definite nodule. Histologic examination showed that this area was everywhere infiltrated with carcinomatous glands.



In these cases the carcinoma has extended to the under surface of the liver either by the lymphatics or by continuity. It has then traveled along the suspensory ligament to the umbilicus. The umbilical growth, accordingly, lies extraperitoneally between the peritoneum and the fascia. From this point it gradually spreads through the surrounding fat as a rather diffuse growth. This growth on section reminds one more of dense fibrous tissue than of a carcinoma (Figs. 3, 5 and 6.) In the early stages there are no definite discrete foci that could be recognized as carcinomatous. Their absence is due to the fact that the glands are so thoroughly scattered throughout the fibrous tissue. Rarely in the early stages is the peritoneum implicated. In each of the three illustrations the peritoneum was perfectly smooth.

After the umbilical nodule has been in existence for several months the lymph-glands may be implicated. The superficial lymphatics from the upper part of the umbilicus pass to the axillary glands; those from the lower portion to the inguinal glands. The deep lymphatics pass either to the retrosternal or iliac glands.

Cancer of the stomach may occasionally become adherent to the anterior abdominal wall and involve the umbilicus by continuity. While a gastric cancer is the most frequent cause of secondary growth at the umbilicus, cancer of the small or large intestine or of the uterus or ovaries may be followed by a secondary umbilical growth. In these cases the extension to the umbilicus may be by way of the lymphatics, by continuity or through secondary involvement of the omentum: In several cases the omentum has been caught in an umbilical hernia and the incarcerated nodule has involved the umbilical peritoneum. In one case at least the umbilical cancer was secondary to a malignant growth of the gall-bladder.

Tisserand<sup>17</sup> saw a woman, 54 years of age, who had been suffering from pain in the umbilical region for five months. The umbilicus was very red, slightly painful and indurated. An exploratory operation was performed and the patient died suddenly on the tenth day. Cancer of the gall-bladder was found. This viscus also contained gall-stones. The glands along the suspensory ligament to the umbilicus looked like beads. No trace of cancer was detected in any other organ.

17. Tisserand: A propos de deux cas de cancer secondaire de l'ombilic, *La Loire méd.*, 1906, xxv, 131.

In my last case the umbilical cancer was secondary to cancer of the gall-bladder.

In the cases in which the patient remains alive for a long period, or in which the abdominal growth is a rapid one, the gastric cancer may break through and an abscess develops usually between the liver, stomach, transverse colon and lateral abdominal wall. This abscess may find its way to the umbilical opening and form a permanent fistula. In those cases in which the stomach has become adherent to and involves the umbilicus by continuity the growth may be very rapid. There is first the thickening at the umbilicus and the overlying skin becomes fixed. Next there may be some reddening, fever, fluctuation and the physician or surgeon, thinking he is dealing with an abscess, opens it. A small amount of bloody serous fluid escapes; later particles of food may be detected. The growth occasionally wells up out of the fistulous tract, forming a cauliflower-like mass and the surrounding skin becomes markedly excoriated. Such a termination, however, is not common.

In the specimen sent me by Dr. Haggard, of Nashville, the umbilicus, apart from being much larger than usual and being markedly indurated, shows little change. The umbilicus in my first case was moist, and had little granular projections springing from it. In my second case the umbilicus was only slightly enlarged and the thickening could not be detected until the umbilicus was lifted up between the fingers. In my first case I removed the umbilicus thinking that it was the seat of a primary growth. In my second case it was removed on account of the severe pain experienced by the patient.

From what I have said, then, it is evident that there are two very important clinical factors to be considered. If an umbilical nodule be detected in a middle-aged person, the condition of the abdominal organs must at once be most thoroughly investigated. If moderate or marked indigestion exists cancer of the stomach may be suspected. If frequent jaundice has been present the possibility of cancer of the gall-bladder following gall-stones may be thought of as the causative factor. Marked intestinal symptoms will naturally suggest a growth in the small or large intestine, and a pelvic examination will tend to exclude or confirm the probability that the uterus or ovaries may be responsible for the umbilical growth.

The last case came under my observation a few weeks ago after my attention had been especially directed to this subject. The typical history of gall-stones coupled with the non-inflammatory umbilical thickening at once suggested carcinoma and I made a provisional diagnosis of cancer of the stomach or gall-bladder associated with gall-stones and interpreted the umbilical growth as a secondary manifestation. At operation I found gall-stones, cancer of the gall-bladder with involvement of the periportal lymph glands, and small metastases in the lesser omentum; histologic examination also revealed the presence of a secondary adenocarcinomatous growth at the umbilicus.

The second point this study brings out strongly is the futility of removing the umbilicus when the primary growth is in the abdomen. If one can positively say that cancer of an abdominal organ exists, removal of the umbilical growth is of little value because the disease is already too wide-spread to permit of total eradication. On the other hand, in some of the cases the symptoms are so obscure that a diagnosis cannot be ventured until an exploratory operation has been performed; and again, in cases such as my last one the chief pain is referred to the navel region and removal of the umbilicus is followed temporarily by comfort.

#### SECONDARY ADENOCARCINOMA OF THE UMBILICUS; ILLUSTRATIVE CASES

**CASE 1** (Path. No. 15,029).—The specimen sent me by Dr. Haggard of Nashville, Tenn., in April, 1910, consists of the umbilicus with a good deal of surrounding tissue. The entire specimen measures 10 cm. in length, 7 cm. in breadth. The umbilicus is 2.5 cm. across and is covered with skin. It presents a rather uneven, nodular surface, and is much more prominent than usual, having welled up in the center (Fig. 3). There is, however, no evidence of ulceration at any point. On section the distance between the umbilicus and the peritoneal surface is 2 cm. The tissues look fibrous and in the vicinity of the umbilicus show infiltration apparently with fibrous tissue. At one point is an area of what looks like localized fibrous thickening 2.5 cm. in diameter. The adipose tissue has been almost entirely replaced at this point.

**Histologic Examination.**—The squamous epithelium is intact and there is pigmentation in the deeper layers, suggesting that the specimen has come from a colored patient. The tissue immediately beneath the skin in some places is normal; at other points it shows some small, round-cell infiltration.

Scattered everywhere throughout the thickened fibrous tissue are glands. Some of them are small and round, others elongated or tubular; others are dilated. The glands are lined with cylindrical or cuboidal epithelium which in most places is one layer in thickness. The nuclei of the epithelial cells are for the most part oval and stain uniformly. A few of the epithelial cells have very large and deeply staining nuclei. Where the glands are dilated the epithelium tends to become cuboidal. At other points the glands are exceedingly abundant, are undergoing disintegration and are filled with mucus. In some places the epithelium is several layers in thickness. Here and there gland epithelium has proliferated to such an extent that new glands are being formed. The growth is undoubtedly a carcinoma of a glandular type and similar to that originating either in the stomach or intestine.

CASE 2.—Secondary carcinoma of the umbilicus; metastases in the right inguinal glands. Mr. G., 42 years of age, was seen in consultation Aug. 30, 1904. The patient was well nourished, and complained of a discharge from the umbilicus. Six weeks before he was struck in the abdomen with a shoe and the umbilicus commenced to discharge three weeks later. The umbilicus itself presented a granular appearance (Fig. 5) and the tissue surrounding it was indurated. The patient had had dyspepsia for years; also pain in the lower abdomen over the appendix. He was admitted to the Church Home. Under anesthesia the inguinal glands were carefully palpated. A definite enlargement was found in the right side. An incision 10 cm. in length was made and the inguinal glands removed, together with the surrounding fat. I then made a long elliptical incision around the umbilicus and removed the umbilical tumor, giving the hardened area a wide berth. The growth at the umbilicus closely resembled a retracted nipple. The patient took the anesthetic badly. Consequently I could not make as thorough an abdominal exploration as desired. With the finger carried in all directions I was unable to detect any thickening.

*Histologic Examination* (Path. No. 7729).—The umbilical growth proved to be a typical adenocarcinoma. The squamous epithelium in many places was normal, but along the edge of the growth it was impossible to distinguish between the cells of the adenocarcinoma and those of the squamous epithelium. There was as yet little breaking down. The growth in the inguinal glands macroscopically looked like cancer (Fig. 4). On histologic examination it presented exactly the same pattern as that noted at the umbilicus.

On Jan. 25, 1905, the patient was in fairly good health. He still had considerable constipation, however. He also had great difficulty in defecation. February 24, a firm globular mass fully 10 cm. in diameter occupied the middle of the abdomen and the left inguinal glands were considerably en-

larged. The umbilical growth was undoubtedly secondary to the intestinal cancer. In May, 1905, I again saw the patient. His bowels had not moved for ten days and he was so emaciated that one would hardly recognize him. The abdominal nodules were everywhere palpable. He died a few days later.

CASE 3.—Adenocarcinoma of the umbilicus secondary to carcinoma of the gall-bladder. Mrs. B., aged 58, was seen in consultation with Dr. George L. Wilkins and admitted to the Church Home and Infirmary, April 24, 1910. The patient complained of an "umbilical nodule and of gall-stones." Her past history was negative. The menopause had occurred at 50. The patient had had five children. The first and last labors were instrumental.

The patient showed a slight bulging at the umbilicus on standing. This was painful when the clothes rubbed against it. It was noticed first in December, 1909, that is, about four months before examination. For some months the patient suffered at intervals with pain in the region of the gall-bladder and had been jaundiced. The pain radiated to the back and to the right shoulder. At the time of examination there was some tenderness in the gall-bladder region. She suffered from the presence of gas and from constipation. There had been no clay-colored stools. The heart and lungs were normal. The urine was practically normal.

From the history and general condition a provisional diagnosis was made of either cancer of the stomach or of the gall-bladder, associated with a secondary nodule at the umbilicus. On examination of the umbilicus there was just a slight rolling out, but nothing to suggest a nodule until one picked the umbilicus up between the fingers, when marked sensitiveness became apparent (Fig. 6).

*Operation.*—April 25, 1910, on making a right rectus incision I at once encountered little nodules in the lesser omentum. The gall-bladder contained numerous stones and also a new growth. The new growth was firm and had extended to the lymph-glands around the portal vein. One of these was over 3 cm. in diameter. We were dealing with a carcinoma of the gall-bladder, together with metastases in the lesser omentum and the umbilicus. On account of the marked involvement of the lymph-glands complete removal of the primary growth was impossible. As the patient had had a great deal of pain in the umbilicus, this was removed. The inner or peritoneal surface of the umbilicus was free from adhesions. The patient made a good temporary recovery and was discharged May 9, 1910.

*Pathologic Examination* (Path. No. 14968).—The specimen consists of the umbilicus and surrounding skin. It is 7 cm. in length, 5 cm. in breadth. The umbilicus is slightly prominent. It is commencing to unfold a little as seen in Fig. 6.

It was not quite so prominent, however, in the fresh state. The nodule could be readily felt on lifting the umbilicus up with the fingers. It appeared to be about 1 cm. or more in diameter. In the hardened specimen the tissue was contracted, bringing the effect out more prominently. The skin was everywhere intact. The peritoneal surface was slightly puckered, but was free from adhesions. On section of the umbilicus the tissue looked fibrous and in its middle portion was what appeared to be a little area of hemorrhage about 2 mm. in diameter. At first sight one would not for a moment suspect the presence of carcinoma.

*Histologic Examination.*—The squamous epithelium is intact and immediately beneath it in a few places are some sweat glands. Approaching the peritoneum colonies of glands are found closely packed together with very little connective tissue between them. The gland epithelium is for the most part one layer in thickness. In some places it is cuboidal, at other points cylindrical, and there are very minute glands. The nuclei of the epithelial cells stain uniformly, but vary considerably in size. In some places the epithelial cells seem to have a tendency to be arranged in single rows. The growth is without doubt a carcinoma. The small metastatic nodules found in the lesser omentum in the neighborhood of the gall-bladder present a precisely similar appearance. We are undoubtedly dealing with a primary carcinoma of the gall-bladder, involving the lymphatics around the portal vein. There have been metastases in the lesser omentum and also involvement of the umbilicus.

3 West Preston Street.

A MALIGNANT INTESTINAL GROWTH REQUIRING  
THE REMOVAL OF AN UNUSUAL NUMBER  
OF ABDOMINAL STRUCTURES

BY

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A MALIGNANT INTESTINAL GROWTH REQUIRING  
THE REMOVAL OF AN UNUSUAL NUMBER  
OF ABDOMINAL STRUCTURES

BY THOMAS S. CULLEN, M.B.  
*Baltimore, Maryland.*

MY object in reporting this case to the society is to show what may be done in some cases in which the surgeon, on opening the abdomen, feels completely baffled, but in which, on carefully surveying the field, he finally detects the key to the situation, and can remove the growth that at first has seemed impossible of enucleation.

In this case my first impulse was to close the abdomen, but the family physician, Dr. Ira McCurdy, of Frederick, insisted that the patient had been suffering from excruciating abdominal pain, that there were already signs of partial obstruction, and that, judging from her condition for the past month, he felt sure she could not last over a few days without operation. Under these circumstances I made a further examination of the combined tumor, and found that the key to the situation consisted in first enucleating the uterus with the adnexa and turning them up on the tumor. The operation then became essentially an abdominal instead of an abdominopelvic one.

The after results certainly more than repaid us for the chances taken. The patient, after a short time, was completely relieved of her former pain, and in a few weeks was able to go about as usual. She had over a year of relatively good health before any further signs of the growth made themselves perceptible.



Mrs. M., aged fifty-six years, was seen in consultation with Dr. McCurdy, December 20, 1909. She was exceedingly thin, pale and emaciated. Before her illness, which dated back several months, she had weighed 120 pounds. At the time I saw her she weighed 85 pounds.

On pelvic examination I found what appeared to be a myomatous uterus, which was firmly plastered to the left side of the pelvis and which almost completely filled it. As the patient gave a history of having flattened stools, occasionally associated with diarrhea, we bore in mind the possibility of a malignant intestinal growth.

*Operation.* The patient was removed to the Johns Hopkins Hospital, where she was operated upon on December 28, 1909. On opening the abdomen we immediately found what appeared to be a mesenteric growth. Plastered over the surface were loops of small intestines and a considerable area of large bowel. The fundus of the uterus was firmly adherent to the tumor, and the appendix was also involved in the growth. Realizing the weak condition of the patient, and the extensive operation necessary to even attempt complete removal of the growth, I hesitated, but on being told by Dr. McCurdy that the patient could not live over a few days in her present condition, I accepted the responsibility and commenced the operation. After determining definitely that no secondary growths were visible, and finding that the original tumor was somewhat movable, and that it did not implicate the larger abdominal vessels, we started its removal. The key to the situation consisted in first freeing the uterus. I therefore did a supravaginal hysterectomy, taking away the uterus, tubes, and ovaries. No attempt was made, however, to separate the pelvic structures from the intestinal growth, but they were turned up on the surface of the tumor and the empty pelvis was then packed with gauze. The appendix was found intimately attached to the tumor mass. It was likewise cut off, covered with gauze to prevent infection, and turned up on the surface of the tumor;

the stump was then closed. We next encountered an adherent loop of small bowel near the cecum; to this a clamp was applied. The other end of the same loop, about 18 inches distant, was also clamped and the intervening bowel cut loose. The descending colon over an extent of several inches was intimately blended with the tumor. This area was freed. Finally, we were able, after using many catgut sutures, to tie off the mesentery which fastened the tumor to the vertebral column. The entire mass, consisting of the tumor, the descending colon, a large area of small bowel and several inches of large bowel, the uterus, tubes, ovaries, and appendix, was then removed in one piece. On carefully examining the small intestine we found that the blood supply for at least a foot and one-half had been injured; we therefore removed this area of bowel also.

The two ends of small bowel were closed and a lateral anastomosis made between the small bowel and the cecum, which was only an inch removed from the distal end of the small bowel. On the left side, where a considerable area of descending colon had been removed, the tissues were fortunately redundant. Here also we closed both ends and did a lateral anastomosis between the descending colon and the sigmoid. A drain was laid in the lower angle of the abdominal incision and another in the vagina.

The patient on her return to the ward showed a moderate degree of shock. After a week or two she had slight diarrhea, but otherwise manifested no untoward symptoms. At the end of five weeks she returned home in relatively good condition.

December 1, 1910. I heard from this patient a few days ago. She is in excellent health and is going everywhere. She has a good appetite and digestion.

March 20, 1911. The patient is rapidly losing weight, has a great deal of abdominal pain, and from the present indications will not survive over a month or six weeks.

*Description of the Tissues Removed.*

Path. No. 14,543. Examination of the hardened specimen: The specimen (Fig. 1) is made up of 15 cm. of the descending colon, containing a malignant growth, of between two and three feet of small bowel, of the uterus with its appendages, and the appendix, all in one mass.

The descending colon is occupied by a newgrowth, 8 cm. in length. This involves the entire circumference of the bowel, the walls varying from 5 mm. to 1 cm. or more in thickness. The bowel, where thickened, is in places smooth, but at other points presents an eaten-out appearance. The advancing margin of the growth is sharply defined and raised about 1 or 2 mm. from the surface. On the inner or median aspect of the growth there is a perforation. The growth has extended directly through and has communicated with a loop of small bowel. It has likewise encroached on the mesentery of the small bowel, forming a tumor, globular in shape and about 7 cm. in diameter. This has extended to the peritoneal surface of the mesentery, but does not appear to have broken through the surface. At one point, however, it forms a subperitoneal nodule 1 cm. in diameter. At the point where the fistula has extended from the colon into the small bowel, the walls have evidently become exceedingly thin and the right cornu of the uterus has become plastered on to the mesentery at that point (Fig. 2), evidently acting as a cork and preventing the broken-down area from bursting into the peritoneal cavity. The cornu of the uterus is firmly attached to the mesentery over an area 5 cm. in diameter.

The uterus itself is a little enlarged. The tubes and ovaries are normal.

The middle portion of the appendix is glued to the mesentery. The tip of the appendix is free, but the surface is in places covered with adhesions.



FIG. 1.—Removal of a carcinoma of the sigmoid, several feet of small bowel, the uterus, tubes, and ovaries, and the appendix in one mass. The entire circumference of the sigmoid is involved by a carcinomatous growth. The advancing margin of the growth is sharply defined, and from the lower edge a long tongue-like polyp is growing. The cancer has eaten through the sigmoid and grafted itself upon the small bowel, and at one point had perforated the small bowel (as indicated by the bristle). Here there is a fistulous opening between the sigmoid and the lumen of the ileum.

Where the necrotic cancerous mass tended to break through into the general peritoneal cavity the uterus has adhered to it, thus eliminating the danger of peritonitis from this source. The normal tubes and ovaries are attached to the uterus. The appendix was involved in the process. It lies on the under surface of this mass. For the tumor on section, see Fig. 2.

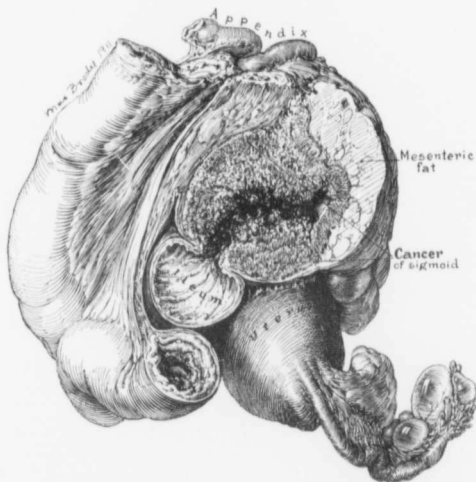


FIG. 2.—Carcinoma of the sigmoid breaking through into the ileum. This figure represents a transverse section through Fig. 1. The carcinoma occupies the entire circumference of the sigmoid at this level and has formed a fistulous opening into the ileum. The uterus has become intimately blended with the growth, reinforcing it at the point where it tended to rupture into the general peritoneal cavity. The adherent appendix is seen in the upper part of the specimen.

*Histological Examination.* Sections from the growth in the descending colon shows that it is an adenocarcinoma, the glandular type being very evident. The glands themselves, which, as a rule, are large, are lined with several layers of epithelium, and many of the glands contain secondary ones developing within them. The superficial portions of the growth have undergone necrosis. There is fragmentation of nuclei and coagulation necrosis. The uterus is the seat of a commencing adenomyoma. The appendix shows marked involvement.

In this case we have primarily a malignant growth of the descending colon. This has involved by continuity a loop of small bowel and opened into it. It has also formed a large tumor which has encroached on the mesentery of the small bowel. The fundus of the uterus has glued itself on to this malignant growth where the walls tended to give way.

# An Extra-Abdominal Multilocular Ovarian Cyst

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AMERICAN MEDICAL ASSOCIATION  
FIVE HUNDRED AND THIRTY FIVE DEARBORN AVENUE  
CHICAGO

AN EXTRA-ABDOMINAL, MULTILOCLULAR  
OVARIAN CYST\*

THOMAS S. CULLEN, M.D.  
BALTIMORE

Several months ago, Dr. Frank R. Smith asked me to see a woman who had a kidney-shaped tumor slightly below and to the right of the umbilicus. The patient had noticed a small lump in this situation several years before, which for a long while had remained quiescent but during the last year had gradually increased in size. At operation it was found to be a partly solid, partly cystic tumor of the ovary lying external to the abdominal muscles, the tumor and its surrounding sac being covered over with a small amount of adipose tissue and the skin. The pedicle of the tumor passed through a hernial ring to the outer side of the right rectus and obliquely across the lower abdominal cavity to what corresponded to the normal insertion of the right utero-ovarian ligament.

I have been unable to find any reference to a similar case in the literature.

*History.*—Mrs. M. W., aged 56, was a short, well developed woman, and, apart from a tumor mass in the lower abdomen, was in excellent health. She had had eleven children. Her periods had ceased at 59. She had felt some pain in the right ovarian region for fifteen years, and for about ten years she had noticed a little tumor situated in the right lateral abdominal wall slightly above a line drawn between the umbilicus and the anterior superior spine. This, from her description, seemed to have been about the size of an ovary. During the last ten months this small lump had increased in size until it formed a lobulated mass, elongate in form, about 10 by 8 cm. It seemed to be but a short distance beneath the skin and could be lifted up to some extent in the hand, but its absolute relationship could not be determined on account of the presence of a considerable amount of adipose tissue.

\* From the Gynecological Department of the Johns Hopkins Hospital.



*Operation.*—Nov. 1, 1910, on making a pelvic examination, under anesthesia I found that the uterus was normal and that there was no thickening laterally. Not being sure of the exact condition, I made a median incision. The uterus was normal, the left tube and ovary presented the usual appearance. The right tube showed no change, but the right utero-ovarian ligament was markedly drawn out into a band about 1 cm. broad. This led to a hernial opening with smooth margins in the right lateral abdominal wall below and to the right of the umbilicus, but at least 12 cm. from the inguinal region (Fig. 1). After obtaining good exposure I found that this flattened band of the utero-ovarian ligament passed directly into a hernial opening about 2.5 cm. in diameter, and into this opening a finger could readily be introduced. The intra-abdominal portion of the pedicle was clamped off and sutured. An incision was then made over the prominent part of the abdominal tumor, which proved to be extra-abdominal. The more prominent part of this tumor lay directly beneath the skin in the adipose tissue, and was very easily freed by blunt dissection to the point where the hernial ring entered the abdomen. I then cut the peritoneum around the hernial ring and delivered the tumor, with its peritoneal covering intact. The space where the tumor had existed having been obliterated and the inner incision having been sutured, the outer wound was also closed. The ovarian tumor was multilocular.

There had evidently been a hernial protrusion through the right lateral abdominal wall, into which the ovary had dropped and remained for several years. During the last year it had increased in size and given rise to a multilocular ovarian cyst. Naturally with the increase in size, the escape of the ovary from the sac was impossible.

*Macroscopic Examination of Hardened Specimen* (Path. No. 15,723).—The hernial opening was about 2.5 cm. in diameter. Its margins consisted of peritoneum, outside of which was a zone of adipose tissue. The tumor itself was kidney-shaped (Fig. 2) 12 cm. long, 7 cm. broad, and 6 cm. in thickness. It was covered everywhere with peritoneum, which could be readily separated from it. Here and there attached to the outer surface of the peritoneum were tags of adipose tissue. The tumor itself was in large measure solid, resembling a fibroma. It presented a lobulated appearance. Here and there between nodules it showed cystic spaces, oblong, irregular, or round, varying from 2 mm. to 2 cm. in diameter. The majority of these were transparent and contained clear fluid. Some of them were slightly blood-tinged. So much could be made out through a window, which was cut in the peritoneum. On peeping in through the hernial ring, were seen cysts varying from 2.5 cm. to 3 cm. in diameter and apparently filled with clear fluid. After the drawing had been made the tumor was cut in two. The appearance on section is well shown in the drawing in the right upper corner of Figure 2.

*Histologic Examination.*—The solid portion of the tumor consisted in large part of fibrous tissue containing triangular or spindle-shaped nuclei. In some places the nuclei were abundant, in others scanty in number. The tissue showed a considerable degree of hyaline degeneration. At one or two points characteristic ovarian stroma was still in evidence. No Graafian follicles could be found, but after an examination of numerous sections a typical corpus fibrosum was noted. In some sections a few bundles of non-striated muscle were visible. The stroma had a meager blood-supply except in a few areas, where there were groups of rather large veins.

Scattered sparingly through the stroma were small circular or irregular glands occurring singly or in groups of two or three. They were found to be lined with cylindrical epithelium and were similar to those so frequently noted in the hilum of the ovary. Some of the very small cystic spaces, noted macroscopically, were lined with cylindrical ciliated epithelium and had an underlying stroma that stained rather deeply and that consisted of cells with oval vesicular nuclei. This stroma stood out in sharp contrast to the surrounding fibrous tissue. Such cysts frequently contained a little fairly fresh blood. These cysts reminded one very much of the cystic spaces so frequently noted in an adenomyoma, but I believe that they represented only the earlier stages of the larger cysts.

The large cysts were lined with one layer of epithelium which might be cylindrical, cuboidal or almost flat. Projecting into some of the cysts were papillary folds. These occasionally occurred as delicate, irregular, finger-like projections, but in the main as blunt, single or branching outgrowths. All of them were covered over with one layer of epithelium. The stroma of the papillary masses had in many places undergone almost complete hyaline degeneration, and in a few liquefaction of this hyaline material had taken place. Even in some of the larger cysts a moderate amount of fresh blood was present. The stroma cells beneath the cyst epithelium had in some places become swollen and spherical and were filled with yellow or brown pigment indicating the absorption of blood at some previous time.

On the surface of the tumor were a moderate number of vascular adhesions, and on the under and protected side of these the peritoneal cells had become cuboidal as is common on the under side of tubal or ovarian adhesions.

From the above description it will be seen that the dense matrix of the tumor consisted essentially of fibrous tissue and that scattered throughout this were multiple cysts, in large measure similar in character, some of which had small papillary masses projecting into them. Had the tumor developed in the abdominal cavity, I believe that in all probability it would have been a multilocular cystoma, but as it lay between the abdominal muscles and skin a rapid cystic growth was much

more difficult, and the fibrous tissue was thus allowed to keep pace with the cystic formation.

There was no sign of malignancy.

#### THE PRESENCE OF OVARIES IN HERNIAL SACS

The occurrence of ovaries and ovarian tumors in hernial sacs is of particular interest in this connection. I shall, therefore, briefly discuss the more important contributions made in this field.

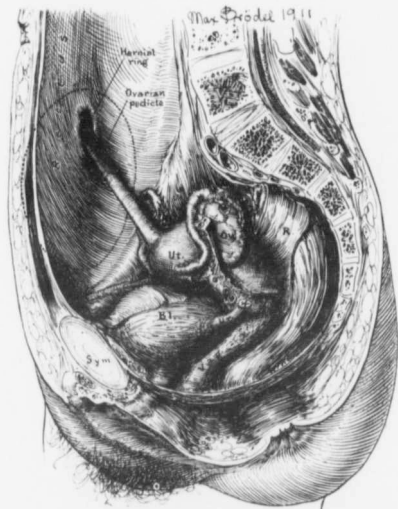


FIG. 1.—OVARIAN PEDICLE PASSING FROM UTERUS, OUT THROUGH A HERNIAL RING IN THE ABDOMINAL WALL. A schematic representation of the pelvic structures as found at operation. The uterus and left appendages were normal. The right tube was unaltered, but passing from the uterus where the right ovary should have been was a band 1 cm. broad. This ran upward and outward and passed out through an abdominal ring to the outer side of the right rectus. At the ring a finger could be passed completely around this pedicle. It was nowhere adherent to the ring. A glance at the umbilicus will indicate the exact location of the ring. On looking through the ring a small portion of the glistening tumor could be readily seen. The dotted line indicates the relative size of the tumor.

The ovary has a rather free excursus, and it is not to be wondered at that where an inguinal or femoral hernia exists the ovary and often the tube form part of the contents of the hernial sac. Puech<sup>1</sup> in 1879 contributed a most interesting article on hernia of the ovary. In addition to his own cases, he refers to those of Pott, Lassus, Deneux, Guersant, Parker, Bruny, Warren, Méadows, Cusco, Coote, Englisch, Weinlechner, MacCluer, Sonnenburg, Werth and Rheinstaedter. In brief his paper says that the ovary may pass out at any of the natural abdominal openings, and that, when it does so, it is most frequently by way of the femoral or inguinal ring. The inguinal hernia, which is the more frequent, may be congenital or accidental. The congenital hernia is produced by a condition analogous to the descent of the testicle. In eighty-eight cases of hernia containing the ovary, fifty-four were incontestably congenital, seventeen doubtful and seventeen accidental. The congenital hernias were unilateral in twenty-seven cases, bilateral in twenty-seven cases. In the unilateral cases the left side was more frequently involved. In cases of double hernia the presence of the ovaries in the hernial sac was sometimes associated with defective development of the generative organs. Puech had records of sixteen cases in which the ovary was contained in a femoral hernia. In eleven of these cases the hernia was on the right side and in four on the left.

The uterus or one of its cornua was found ten times in the sac in cases of inguinal hernias, three times among the femoral hernias.

Dr. Joseph C. Bloodgood tells me that he has had two cases of femoral hernia with the ovary lying in the hernial sac.

Several years ago I operated on a child in Cambridge for an inguinal hernia. The sac contained the right tube and ovary. They were so intimately blended with the sac that it was impossible to save them, and they were removed preparatory to doing a radical operation.<sup>2</sup>

1. Puech, A.: *Nouvelles recherches sur les hernies de l'ovaire*, *Ann. de gynéc.*, Paris, 1879, xl, 401.

2. This case was reported and illustrated in an article published by Dr. Frank T. Andrews (*Hernia of the Ovary and Tube*, *THE JOURNAL A. M. A.*, Nov. 24, 1906, p. 1707). Dr. Andrews' article gives an excellent résumé of hernia of the ovary and tube, and likewise contains a long tabulation of cases heretofore observed.

My experience with ovaries in hernial rings associated with lack of development of the generative organs has been limited to one case.<sup>3</sup>

A postoperative hernia occasionally contains an ovary. I reported a case of this character several years ago.<sup>4</sup> The patient had had an appendix abscess, which it had been necessary to drain liberally. The resultant hernia in the scar was very tender and in dissecting it out I found that the sensitiveness was due to the presence of the right ovary contained in and adherent to the hernial sac.

#### OVARIAN TUMORS DEVELOPING IN THE INGUINAL CANAL

Since one or both ovaries may occasionally be found in the inguinal canal, we should not be surprised to find now and then a case in which such an ovary undergoes tumor development. Rheinstaedter<sup>5</sup> in 1878 reported the case of a woman, 68 years of age, who had an elongate oval tumor in the neighborhood of the clitoris. In addition, there was a right-sided globular mass, which was found to be a right inguinal hernia. The oval tumor was larger than a child's head, elastic and apparently fluctuant. The overlying skin was normal. A probable diagnosis of ovarian tumor in a left inguinal hernia was made. Six months later the left hernial sac was opened. The tumor was easily raised and its broad pedicle apparently containing the tube and round ligament was tied off, some adherent loops of small bowel were loosened and pushed up into the abdomen, and the wound closed. The tumor weighed 750 gm. Careful examination of the right hernia revealed the presence of the ovary in the sac.

Marchand, who made the microscopic examination, diagnosed the tumor as an angiosarcoma.

Rheinstaedter, in reviewing the literature on the subject, was able to find only one case in which an ovarian tumor in an inguinal hernia reached the size of a child's head. This was the case observed by Cazati and quoted by Beigel. The hernial sac contained a portion of an ovarian cyst, the remainder of which lay in the pelvis.

3. Cullen, Thomas S.: A Right Pelvic Kidney; Absence of the Left Kidney; Absence of the Uterus, Both Ovaries in the Inguinal Canals, Surg. Gynec. and Obst., July, 1910, p. 73.

4. Cullen, Thomas S.: The Right Ovary in the Abdominal Scar Following an Operation for Appendix Abscess, May, 1906, Bull. Johns Hopkins Hosp., xvii, No. 182, p. 152.

5. Rheinstaedter: Kindskopfgrosses Angiosarkoma Ovarii in einem Leistenbruch, Centralbl. f. Gynäk., 1878, II, 545.



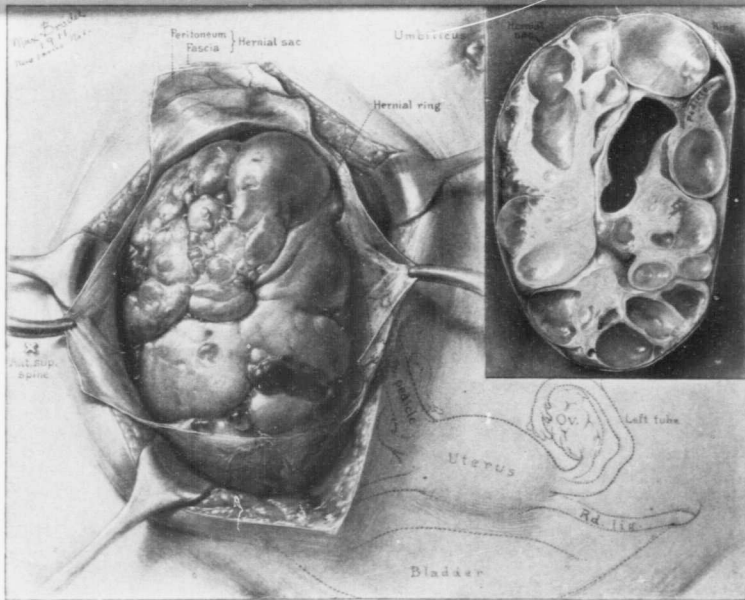


FIG. 2.—EXTRA-ABDOMINAL MULTILOCULAR FIBRO-CYSTOMA OF THE OVARY. The dotted lines indicate the pelvic structures and the right ovarian pedicle passing upward and outward until it emerges from the hernial ring, a short distance below and to the outer side of the umbilicus. After the abdominal relations had been determined an incision was made directly over the tumor and it and its peritoneal covering were removed intact. A thin layer of fascia and the peritoneum formed the sac. The tumor was roughly kidney-shaped, lobulated and consisted partly of a solid tissue, partly of cysts. Deep clefts subdivided the tumor into several portions. The tumor in the main was free from adhesions, but in a few places there were points of union between the tumor and the peritoneal covering. The drawing in the right upper corner shows the tumor on section. The fibrous tissue is abundant, but at this level the cysts predominate. The clefts are seen to have extended through the tumor. It was possible to lift the various segments out without disturbing the remaining ones. Figure 3 gives the real form of the tumor when liberated from pressure.

Of solid ovarian tumors contained in hernias he mentions only a case of Guersant reported by Englisch.

Fargas,<sup>6</sup> in 1890, described the case of a woman, aged 38, who had a tumor the size of a man's head occupying the right inguinal and labial region. On the left side was an inguinal hernia containing an ovary, which was easily reducible. The patient said that until eight years previous the right side had presented the same appearance as the left, and Fargas, therefore, diagnosed the tumor as a right-sided ovarian cyst. Six years prior to observation the right hernia had become irreducible, and after that had gradually increased in size.

The hernial sac was opened and the cyst lay free from adhesions. Its pedicle was tied off as in an ordinary ovariectomy and the tumor removed. The patient made a good recovery. The cyst was reticulated (multilocular). Fargas confessed that it might have been confounded with a cyst of the round ligament, but its topography rendered its source certain. The woman had had normal menstruation and had borne two children during the existence of this tumor.

Seymour<sup>7</sup> in 1897 reported the case of a woman aged 48. Two years before coming under observation a small tumor had appeared in the right groin. It was somewhat sensitive, hard and irreducible. An inguinal hernia with possibly an incarcerated omentum without strangulation was thought of. At operation the tumor was found attached to the uterus by a pedicle, 4 inches long and  $3\frac{1}{4}$  inch in diameter. This passed out through the inguinal ring to the under surface of the upper end of the tumor in the inguinal canal. The pedicle was tied off and the sac closed. The tumor was ovoid in shape, 4 inches in length and 8 inches in circumference. The microscopic report was spindle-celled sarcoma.<sup>8</sup>

6. Fargas: Note sur un cas de hernie inguino-labiale de l'ovaire droit avec gros kyste réticulaire du même organe, Arch. de focol., Paris, 1890, xvii, 767.

7. Seymour: Hernia of a Sarcomatous Ovary, Tr. Med. Soc. State of N. Y., 1897, p. 376.

8. If the fibrous character of a solid ovarian tumor is definite, one is safe in making a diagnosis of fibroma, and if the growth consists of spindle cells and has many mitotic figures and atypical cell changes, one can with justice make a diagnosis of sarcoma. There are, however, quite a number of solid tumors of the ovary of the spindle-celled type, in which it is impossible to say from the microscope examination whether the growth is a sarcoma or a fibroma. In such cases the diagnosis can never be definitely determined unless the patient subsequently develops metastases.

AN OVARIAN CYST PROTRUDING INTO THE INGUINAL  
CANAL

Baldy<sup>9</sup> in 1898 reported an interesting case of this character. Two years before coming under Baldy's observation the patient had noticed a small pedunculated tumor in the right inguinal region. This had continued to grow until it was as large as an egg and had then been removed. A year later a larger and similar growth had been present and had also been removed.



FIG. 3.—AN EXTRA-ABDOMINAL MULTILOCULAR FIBROCYSTOMA. A schematic representation of the manner in which the tumor tended to develop when relieved from its surrounding pressure. It in reality consisted of four lobes similar in character and joined together by broad or narrow pedicles.

When Baldy saw the patient the growth was as large as a fist. A pelvic examination revealed a mass filling the right side of the pelvis.

At operation, an incision was made directly over the growth and the tumor freed down to a thick, broad,

<sup>9</sup> Baldy, J. M.: Ovarian Cyst Protruding Through the Inguinal Canal, *Am. Jour. Obst.*, 1898, xxxviii, 827.



short pedicle which passed into and through the inguinal canal. The attachments of the pedicle in the canal were freed and the finger forced into the abdomen when it was found that the tumor was a continuation of a large intra-abdominal mass.

When the abdomen was opened in the median line, the pedicle of the inguinal growth was found springing from a large intraligamentary tumor similar in character. The left uterine appendages were normal. A supravaginal hysterectomy was performed and the hernial ring closed. The patient made an uninterrupted recovery.

#### AN OVARIAN CYST LYING PARTIALLY IN A FEMORAL HERNIA

This condition is exceptionally rare. Dellhaes<sup>10</sup> in 1885 cited the case of a woman, aged 55, who entered the hospital in 1879 on account of ascites. For four years she had complained of discomfort in the lower abdomen, and there had been an increase in size in the right side. Thereafter she had had a crural hernia on the right side and for the last nine months a similar hernia on the left. The right was reducible, the left irreducible.

After the patient had been built up to some extent and after the ascitic fluid had been removed several times by puncture, a right-sided ovarian tumor, partly solid, partly cystic, was removed.

The left ovary was cystic and enlarged. It was partly situated in the pelvis and had to be separated from a solid cord which passed into the femoral canal. The major portion of the large cystic left ovary lay in the fold of the groin and fourteen days later was removed through a herniotomy incision. This portion was as large as a child's head. The patient made a complete recovery.

#### A SMALL PORTION OF AN OVARIAN CYST INCARCERATED IN THE ABDOMINAL WALL JUST BELOW THE UMBILICUS

Hopkins<sup>11</sup> in 1894 reported an interesting emergency case. The patient, aged 57, was admitted for a supposed strangulated umbilical hernia. Protruding just

10. Dellhaes: Eine Hernia cruralis cystovaril sinistra, *Ztschr. f. Geburtsh. u. Gynäk.*, 1885, xi, 280.

11. Hopkins, George G.: An Ovarian Cyst Simulating a Strangulated Umbilical Hernia., *Boston Med. and Surg. Jour.*, July 26, 1894, p. 84.

below the umbilical opening was an almost black tumor the size of a walnut. Still thinking that it was a strangulated hernia, the operator cut the constricting band and the tumor at once disappeared. The abdominal opening was enlarged and serous and gelatinous material began to pour out. On further exploration a multilocular ovarian cyst, weighing about 25 pounds, was found. This was removed and the patient promptly recovered.

A small portion of this cyst had become strangulated in a small hernial defect just below the umbilicus.

#### DEFECTS IN THE ABDOMINAL WALL

A study of the weak spots in the abdominal wall is of interest. Levadoux<sup>12</sup> made a most exhaustive examination of the inner appearance of the umbilicus, of the final disposition of the umbilical arteries, the umbilical vein and the urachus, and described in detail how these sometimes blended in such a manner as to form a fibrous sheath that completely covered over the inner umbilical opening. In the course of his studies he also noted weak spots in the fascia just beneath the peritoneum. These openings were usually small and were oval, round or irregular in shape.

On careful scrutiny it has at times been noted that hernias, supposed to be umbilical, were in reality peri-umbilical and that the umbilicus itself was intact. These defects in the fascia are undoubtedly the cause of such hernias. In July, 1910, I saw, in consultation with Dr. A. H. A. Mayer, a boy, aged 17, who had a small hernial protrusion 4 cm. above and to the left of the umbilicus. This hernial protrusion projected 1 cm. through the fascia and was lobulated, forming a mass 3 cm. in diameter. The patient was of spare build. On cutting down on the hernial sac I found a small defect in the abdominal wall with a small portion of the omentum projecting through it. The omentum was readily returned and the opening easily obliterated with a few sutures.

Dr. Bloodgood tells me that he observed a case of hernia of the abdominal wall at the semilunar line, that was between the rectus muscle and those forming the

<sup>12</sup> Levadoux, Michel-Joseph: Variétés de l'ombilic et de ses annexes. Thèse Fac. de Méd. et d'Pharm. de Toulouse, 1907. No. 711.

lateral abdominal wall. The sac contained non-adherent loops of small bowel. The condition was readily cured. In our case the opening was also at, or near, the semilunar line, and instead of small bowel passing into it the ovary had for some reason occupied the space and later had gone on to tumor development. It is just possible that this weakness in the wall had become particularly accentuated during a pregnancy and that the ovary during its ascent with the pregnant uterus had dropped into the cavity.

In conclusion, I wish to thank Dr. Fred Ray for his kindness in ferreting out the references to the articles read by me in the preparation of this paper, and I am especially indebted to Mr. Max Brödel and the Foundation of Art in Medicine of the Johns Hopkins Medical School for the excellent illustrations.

UMBILICAL TUMORS CONTAINING UTERINE  
MUCOSA OR REMNANTS OF  
MUELLER'S DUCT

BY

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BALTIMORE, MARYLAND



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UMBILICAL TUMORS CONTAINING UTERINE  
MUCOSA OR REMNANTS OF  
MUELLER'S DUCT

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and the Johns Hopkins University.)

WHILE gathering together from the literature the numerous cases of primary tumor of the umbilicus, I found several that did not seem to belong to any of the classes hitherto recognized, and yet all of these cases in one or more points bore a certain amount of resemblance to one another. Finally the picture of this new group became so firmly fixed in my mind that when reading the description of a case recorded in 1899, by Dr. Green, of Romford, England, I felt so sure that his case came under this category that I wrote him, asking if perchance he still had a section of the tumor. An examination of the slide which he kindly furnished me showed that we were right in our surmise. In brief, the clinical histories in this class of cases, coupled with the gross appearances of the tumors, leave no doubt that we are dealing with a variety of umbilical tumor never before clearly understood.

The composite picture of such tumors—which were found only in women—is as follows: At some time between the thirtieth and fifty-fifth year a small tumor develops at the umbilicus, reaching its full size in the course of a few months. It is usually described as being the size of a small nut. Sometimes it is painful, especially at the menstrual period,

and in at least one instance there was a brownish bloody discharge from the umbilicus at such times.

The overlying skin is usually pigmented, and there may be one or two bluish or brownish cysts just beneath the skin. These may rupture and discharge a little brownish fluid—old blood. On section the nodule is found to be intimately attached to the skin, is very dense, and is traversed by glistening bands of fibrous tissue. Scattered throughout the nodule one sometimes finds small spaces presenting a sieve-like appearance. These spaces are filled with brownish fluid. Occasionally there may be a small cyst several millimeters in diameter filled with brownish contents. Exceptionally grayish somewhat homogeneous areas are distinguishable in the tumor.

On histological examination the superficial squamous epithelium is usually found intact. It may be normal or thickened. The stroma of the growth is composed of dense fibrous tissue. Sometimes a few bundles of non-stripped muscle are noted here and there in the fibrous stroma. In other specimens the non-stripped muscle is much more abundant than is the fibrous tissue.

Scattered throughout the field are glands, round, oval, or irregular. They occur singly or in groups and are lined with cylindrical epithelium. When occurring singly, they frequently lie in direct contact with the fibrous tissue, but when found in groups, are usually surrounded by a characteristic stroma that stains more deeply, and is much more cellular than the surrounding fibrous tissue. The cells of this stroma between the glands usually have oval or round vesicular nuclei. Frequently some of the glands are dilated and their epithelium is somewhat flattened. The cyst spaces noted macroscopically and filled with brownish fluid are likewise dilated glands and the fluid is old blood. The stroma around the glands frequently shows fresh hemorrhage or remnants of old blood to be recognized by the deposit of blood pigment.

From the above description it is clearly seen that the gland picture is that of the uterine mucosa with its typical glands and its characteristic stroma, and further, that the typical menstrual reaction is often present as evidenced by the pain in the nodule at the periods, the accumulation of old menstrual blood with the formation of small cysts, and in at least one instance by the occasional discharge of blood from the umbilicus. In this case (Fig. 1) one or two of the glands opened directly on the surface, thus allowing free escape of the menstrual blood.

In all nine cases have been recorded. Green's case (Fig. 1), Mintz's first and third cases (Figs. 4 and 7), and Ehrlich's case (Fig. 10) owe their glandular origin without doubt to the uterus or to a portion of Mueller's duct from which the uterine mucosa originally comes. Although the cases reported by Wullstein, Giannettasio, von Noorden and Mintz (Case 2) also probably belong to the same group, the evidence is not quite clear, and without the opportunity of carefully studying the original sections I should not feel justified in claiming with certainty they do.

The most common glandular elements at the umbilicus are remnants of the omphalomesenteric duct. These are usually identical in structure with the glands of the small intestine and never give rise to the cystic dilatations noted in the group of cases under discussion; moreover, hemorrhage into the stroma is exceptional. They differ totally both in their gross and histological appearances.

We have in this group of cases glandular elements that, from their histological appearance and arrangement, correspond exactly to those found in adenomyoma of the uterus, and in one case at least (Green's) the surrounding stroma was composed chiefly of non-striated muscle, making the growth essentially an adenomyoma. In the majority of the cases, however, the stroma consisted of fibrous tissue, little or no muscle being present.

These growths are benign and if removed *in toto*, provided

no other embryonic foci exist, give rise to no further trouble. In Mintz's first case, four years after the first nodule had been removed, two others developed. These were also extirpated.

In Ehrlich's case, in addition to typical uterine mucosa, there was a definite tumor formation that had originated from sweat glands.

In order that the reader may gain a clear insight into each of the cases they are reported in detail, together with the comments on each case. The descriptions of the illustrations naturally differ from those given by the various authors. I have redescribed each picture in the light of our new knowledge of the subject.

*A case of umbilical papilloma which showed some activity of growth in a patient, fifty years of age, and which was due apparently to inclusion of a portion of Meckel's diverticulum.*  
By Charles D. Green.<sup>1</sup> [The author very kindly placed a section of the growth at my disposal. There is no doubt that the gland elements in this case are identical with those of the uterine mucosa, as seen from the accompanying illustrations which have recently been made.—T. S. C.]

The patient, a woman, fifty years of age, had complained of irritation about the umbilicus for about two and a half years, and there had been an occasional discharge, brownish in color. When Dr. Green saw her fourteen months before the growth was removed there was some eczematous irritation of the skin in the neighborhood, but no projecting growth could be observed at that time. The bottom of the umbilical depression had an irregular wart-like appearance. The surrounding eczema soon yielded to treatment, but there was from time to time an irritating discharge from the umbilicus, which the patient declared was always worse during her menstrual periods.

<sup>1</sup>Transactions Pathological Society, London, 1899, vol. 1, p. 243.



The umbilicus with the growth and a portion of the surrounding skin was removed. The omentum was not adherent to the umbilicus and no intestine was seen at operation. The wound healed by first intention and there was no subsequent trouble so far as could be learned.

On microscopic examination the skin was found to be normal. The stroma of the growth was made up of fibrous tissue and non-stripped muscle, scattered among which without any definite arrangement were numerous gland elements. Some of these were very near the free surface, others more deeply placed. They were for the most part tubular, and lined with columnar epithelium showing large deeply staining nuclei. They were thought to be reproductions of Lieberkühn's crypts, but differed from them in their exaggerated dimensions. Some of them were so large that they might almost have been described as cysts. (Dr. Green thought that the growth was a remnant of the vitello-intestinal tract.)

On reading this history I noted that there had been some discharge of blood from the umbilicus as indicated by the brownish color, and, furthermore, that the patient had always been worse at the menstrual periods. This made me suspect the possible presence of uterine glands at the umbilicus. I wrote Dr. Green, and early in July received the following reply:

"The Ferns, Romford, England,

"June 22, 1911.

"DEAR SIR: In reply to your query about my case of umbilical growth, I herewith send you a section from the same, so that you may form your own judgment as to its histology. I did not think it was malignant. I last heard of the patient two and a half years after the operation. She was then alive and well. This, I think, shows that the growth was not secondary to an undiagnosed growth within the abdomen. Owing to removal, I have not subsequently

heard of her, so I cannot say what ultimately happened to her. I enclose a copy of my paper which I happened to have kept.

"Yours faithfully,

"CHARLES D. GREEN."

We were particularly fortunate in obtaining this specimen from Dr. Green, in the first place because it was twelve years since the case had been reported and in the second place because it is one of the most valuable cases of this character thus far on record.

*Dr. Green's Specimen, No. 125.* The skin surface is intact and practically normal, although at a few points the epithelium is considerably thickened. In one or two places, directly beneath the skin, there is a small round-cell infiltration, chiefly in foci. At one point the surface epithelium extends a short distance into a cavity (Fig. 1, c). In the lower portion of the cavity the lining consists of cylindrical epithelium, one layer in thickness. Around this area the stroma shows a considerable amount of hemorrhage. It is from this point that there was undoubtedly bleeding at the menstrual periods. The underlying stroma consists, to a large extent, of non-stripped muscle. Scattered here and there throughout the muscle are glands. They are small, round, oblong, irregular, or large (Fig. 2). A few of them occur singly and lie in direct contact with the surrounding stroma. The majority, however, occur in groups or in chains, and are separated from the surrounding stroma by definite stroma of their own (Fig. 3), which is recognized by its deeper stain and its abundance in vesicular nuclei which are oval or round. Some of the glands are very much dilated. Where such dilatations have taken place, the surrounding stroma frequently shows a good deal of hemorrhage. Were it not for the presence of the skin surface, one would immediately diagnosticate the specimen as an adenomyoma of the uterus. The picture is typical, as seen

from Figs. 1, 2, and 3. The growth is an adenomyoma of the umbilicus. Dr. Green at the time felt sure that the condition was a rare one, as indicated from a second communication dated Aug. 4, 1911:

"Dear Dr. Cullen: . . . I am glad you found my specimen so interesting. . . . I had some photographs prepared, but the Committee of the Pathological Society did not think them of sufficient interest to insert them in the *Transactions*. I was a little disappointed at the time, for I thought that the condition was uncommon. . . .

"With kind regards,

"Yours faithfully,

"CHARLES D. GREEN."

[On looking up the *Transactions* I found that two of the Committee diagnosed the growth as a columnar-celled carcinoma, but whether primary or secondary they were unable to decide. The Chairman of the Committee said some of the members present who examined the specimen were not inclined to regard it as malignant. There is little wonder that at that time confusion existed, and had it not been for the specially favorable opportunity I have had of examining so many cases of adenomyoma I should have undoubtedly overlooked the true origin.—T. S. C.]

W. Mintz, "Das wahre Adenom des Nabels" (True Adenoma of the Umbilicus), *Deutsch. Zeitschr. f. Chir.*, 1899, Band li, S. 545.

CASE I.—In 1883 a woman acquired an umbilical hernia after labor. Ten years later, within the space of about two months, a dark blue tumor, the size of a hazelnut developed on the umbilical elevation. This had two cystic areas on its surface. During menstruation the tumor swelled and the cysts ruptured. They contained blood-tinged fluid. The tumor was extirpated and the hernia repaired. This tumor on section presented a cavernous appearance, but no microscopic examination was made. In 1897, four

years later, there was a return of the hernia, and at the umbilicus were two hard nodules about the size of hazelnuts. On microscopic examination they were found to contain glands lined with cylindrical epithelium and surrounded by a definite stroma. Here and there bundles of non-striated muscle were in evidence. The dilated glands contained blood pigment. Mintz thought he was dealing with remains of the omphalomesenteric duct.

[When discussing this case two years ago, just after making the abstract, I made the following note: "The clinical history, the macroscopic appearance, the picture of the glands, the stroma, and the contents of the dilated glands all point to adenomyoma, although adenomyoma of the umbilicus has never been reported.—T. S. C.]

We are fortunate in again hearing from Mintz on the subject. Ten years later he published an article entitled "Das Nabeladenom," *Arch. f. klin. Chir.*, 1909, Band lxxxix, S. 385. Here he describes, more in detail, the histological findings of the same case. He says the ground substance of the growth consists of connective tissue not very rich in cells. They cross one another or run parallel with one another in cords. Here and there in the scar tissue, one sees gland tubules in either transverse or longitudinal section. They are surrounded by young, very cellular connective tissue, which passes very gradually into the old scar tissue. The glands are lined with one layer of cylindrical epithelium. Their lumina are collapsed and contain blood pigment or reddish colored contents (Fig. 4). In some places the tubules lie close, at other points they are separated. The newly formed connective tissue surrounding them has changed into old connective tissue poor in cell nuclei. Some of the glands are dilated and their epithelium is flattened. The lumina appear to be filled with detritus. Here and there the cylindrical epithelium is unrecognizable and the cavity contains blood pigment (Fig. 5). Where the dilatation has occurred, the epithelium has disappeared; in this way are to be explained the cysts with blood contents which

were noted when the patient first entered the hospital. Between the glandular portion of the tumor there are at some points groups of non-striated muscle fibers that have no definite topographic arrangement in relation with the glands. The microscopic examination shows an adenomatous growth in the scar tissue. This has stimulated the growth of the scar tissue and thus originated the young connective tissue surrounding the new glands. In the meantime the periphery of the nodule in the scar has been converted into sarcoma.

After giving this description he says in a footnote that at the time of writing, that is ten years later, the tumor has nevertheless not returned. The explanation of the origin of this tumor he gives as persistent remains of the omphalo-mesenteric duct which had remained latent for 42 years in the umbilical sear and under the influence of chronic injury (a ten year persistent umbilical hernia) had given rise to adenoma.

[It can hardly be doubted that we are dealing with an adenomyoma, although such a case had heretofore never been described. We have the increase in size at the menstrual period, the cysts with blood contents, glands resembling uterine glands, the characteristic stroma of the mucosa, surrounding the glands that was thought by Mintz to be sarcomatous, and the fact that after the second operation the patient remained absolutely well for ten years. How these glands originated at the umbilicus we do not attempt to explain. We have, however, found them in the inguinal region, and I feel confident that in the course of time somebody will get a clear chain of evidence showing how remnants of the uterus can reach the umbilicus.—T. S. C.]

Mintz. CASE II, p. 392. The woman was thirty-eight years of age. Eleven months before a myomatous uterus had been removed through an abdominal incision. Eight months later she noticed at the umbilicus a tumor which increased in size for three months, and then stopped growing.

During menstruation there was pain in the tumor. From the umbilicus to the symphysis there was an operation scar. At the umbilicus was a conical tumor with its base high in the umbilicus. The tumor extended for 2 cm. above the surface of the abdomen and was covered with pigmented skin. During the excision it was noted that this tumor was adherent to the omentum. With the naked eye one could see in it a cavity containing several drops of brownish fluid. Microscopic examination showed that this cavity was lined with epithelium. There were tubular growths and cavities, some more or less filled. By strong magnification one could see that the canals and spaces were lined with cylindrical epithelium. At other points the cavities contained exfoliated epithelium. Around the glands the connective-tissue cells here and there were star-like, and contained large quantities of collagen, suggesting the tissue of the umbilical cord. At other points the connective tissue surrounding the gland cavities showed inflammatory changes. The tubules were dilated and here and there were seen emigrated leukocytes. In some of the connective-tissue cells hemosiderin was visible.

[In this case we are not sure of the exact condition. It reminds us somewhat of adenomyoma, but no mention is made of muscle. It is just possible that the cells surrounding the glands were not inflammatory, but represented ordinary stroma. This, however, is doubtful. The chief points in favor of adenomyoma are that the tumor was painful during menstruation, and that the cavities contained blood or brownish fluid, and, further, that the patient had been operated upon for a fibroid growth eleven months before, and that on histological examination hemosiderin was noted in the stroma.—T. S. C.]

Mintz. CASE III. The patient was a woman forty-five years of age. Nine months before she had noticed a hardening at the umbilicus. During the first four months the tumor remained stationary in size, but later it grew and was painful.

Then the growth ceased and the pain disappeared. The skin was adherent to the tumor; it was brownish in color and traversing it were slightly dilated veins. The tumor passed in a cone-shaped form into the umbilicus.

The tumor on section was found to consist of firm scar tissue in which numerous small cysts filled with brownish contents were noted.

*Microscopic Examination.* The connective-tissue portion of the skin passes directly into the connective tissue of the tumor. This consists of parallel and irregular connective-tissue strands, here and there showing small round-cell infiltration. With the low power one sees cavities of various sizes filled with a brownish pigmented fluid. The small round and tubular cavities are partly arranged in groups, partly separated from one another by old scar tissue. The tubules here and there show dichotomous branching (Fig. 6). At several points the growth is seen passing in various directions. At many points where one group of unchanged tubuli exists it is surrounded by young connective tissue which, toward the periphery, passes off into the old fibrous tissue (Fig. 7). The cavities of more recent formation, and the tubuli are lined with one layer of cylindrical epithelium. In the more widely dilated cavities the epithelium assumes a flattened shape. On further dilatation the epithelium becomes still flatter and drops off into the cavities. These cavities are surrounded by connective tissue (Fig. 8). They contain detritus, swollen epithelium, and leukocytes.

[Mintz's various figures are very suggestive, and Fig. 7 could very readily be used by us to demonstrate an adenomyoma of the uterus instead of adenomyoma of the umbilicus. Here we have cross-sections of glands forming a definite colony. This area is surrounded by the characteristic stroma of the mucosa. Fig. 8 could picture a mild grade of gland hypertrophy of the uterus. It also is surrounded by the characteristic stroma of the mucosa. Although no mention is made of muscle being found in this

growth, the glands and the gland branchings are absolutely identical with those of the uterus. In my case of adenomyoma of the round ligament,<sup>1</sup> connective tissue predominated, and there is no reason why in some of these cases also connective tissue should not take the upper hand throughout.—T. S. C.]

On page 396 Mintz gives a *résumé* of his three cases. They developed in women of middle life in the umbilical tissue, and the tumors reached the size of hazelnuts. The growth at first was slow, but suddenly increased after the lapse of several months. Examination of the tumors showed that they were painful. There was an exacerbation (congestion) at the menstrual periods.

In all three cases the microscopic picture showed the growth of tubular glands in the scar tissue of the umbilicus, this glandular growth being accompanied by "granulation tissue reaction." This young connective tissue surrounded the tubular glands and separated them from one another and transformed itself gradually into connective tissue. [This is the characteristic stroma which one normally finds separating the uterine glands from one another.—T. S. C.]

The gland tubules consisted of one layer of cylindrical epithelium, which when the tubules dilated into cavities under the influence of the secretion became flattened. Finally this epithelium disintegrated and dropped into the cavities which contained the albuminous bodies and leukocytes. Mintz thought the tumors originated from remains of the omphalomesenteric duct. He then describes an instance of a somewhat similar growth reported by von Noorden in the *Deutsche Zeitschrift f. Chir.*, 1901.<sup>2</sup>

<sup>1</sup> Thomas S. Cullen. Adenomyoma of the Round Ligament. Johns Hopkins Hospital Bulletin, May, 1896; Further Remarks on Adenomyoma of the Round Ligament. Johns Hopkins Hospital Bulletin, 1898.

<sup>2</sup> See also R. Herzenberg. Ein Beitrag zum wahren Adenom des Nabels. Deutsche med. Wochenschr., 1900, Band 1, S. 889. Herzenberg evidently describes the same cases as those reported by Mintz.



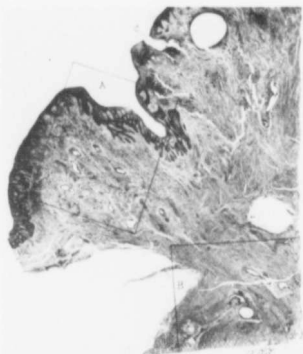


FIG. 1.—A small umbilical tumor containing glands and stroma identical with those of the uterine mucosa. The slide was kindly furnished me by Dr. Charles D. Green, of Romford, England, and is from the umbilical growth reported by him in the Transactions of the Pathological Society of London, 1899. The squamous epithelium is intact and apart from some thickening appears about normal. Scattered throughout the underlying stroma are oval, round, or irregular glands occurring singly or in groups; there are also a few cystic spaces. Some of the glands lie directly beneath the skin. At *C* two of the glands open directly on to the surface of the umbilicus. Area *A* has been enlarged and is shown in Fig. 2. The increased magnification of area *B* is seen in Fig. 3. The photomicrographs of this series were made by Mr. H. H. Hart.

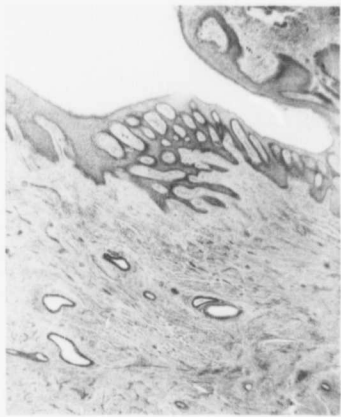


FIG. 2.—Glands from a small umbilical tumor. The picture is an enlargement of the area A, in Fig. 1. The normal character of the surface epithelium is clearly seen. The gland spaces vary considerably in size and shape and are lined with cylindrical epithelium. Those in the picture lie in direct contact with the dense surrounding stroma.

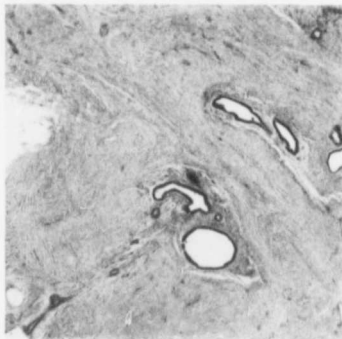


FIG. 3.—Typical uterine mucosa in a small umbilical tumor. An enlargement of area *B* in Fig. 1. The three large glands in the right-hand part of the picture in shape and arrangement resemble those found in an adenomyoma of the uterus; separating them from the dense tumor growth is a definite and characteristic stroma. The group of glands in the middle of the picture is even more characteristic, one of the glands being dilated. All are lined with cylindrical epithelium and the contrast between the surrounding stroma and the dense growth is very clearly marked. As noted in the description non-striped muscle was found scattered throughout the nodule.

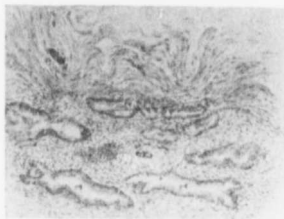


FIG. 4.—Glands in a small umbilical tumor. The outlying connective-tissue stroma is very irregular. Occupying the lower half of the field are glands showing some branching. They are lined with one layer of cylindrical epithelium and lie in a characteristic stroma which separates them from the fibrous tissue of the tumor. The entire picture reminds one to a large extent of adenomyoma of the uterus. W. Mintz. Case I. *Archiv f. klin. Chir.*, 1909, Band LXXXIX, S. 387.



FIG. 5.—Dilated glands in a small umbilical tumor. In the centre of the field is a very much dilated gland. Its epithelium is flattened. The gland itself is separated from the surrounding stroma by a definite dark-staining zone. As noted in the history the dilated gland cavities in the tumor contained exfoliated epithelium, granular material, and in some instances blood. W. Mintz. Case I. *Archiv f. klin. Chir.*, 1909, Band lxxxix, S. 388.



FIG. 6.—Dichotomous branching of glands in a small umbilical tumor. The histological picture might very readily be taken for that of an adenomyoma. In the lower part the gland shows dichotomous branching. W. Mintz. Case III. *Archiv f. klin. Chir.*, 1909, Band lxxxix, S. 394.



FIG. 7.—Uterine glands in an umbilical tumor. The gland grouping in the picture is similar to that seen in a typical adenomyoma of the uterus. In the colony of glands near the centre of the picture the glands are regularly distributed and are surrounded by a definite stroma which separates them from the matrix of the tumor. The chain of glands in the left upper corner is in part surrounded by stroma, but some of its glands lie in direct contact with the dense surrounding tissue. W. Mintz. Case III. *Archiv f. klin. Chir.*, 1909, Band lxxxix, S. 395.

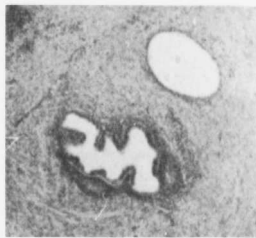


FIG. 8.—Gland hypertrophy in a small umbilical tumor. Near the centre of the field is a gland showing some hypertrophy. Separating it from the surrounding stroma is a characteristic stroma which stains more deeply and is rich in cell elements. This picture could be used very readily as an example of a uterine gland in the muscle. W. Mintz. Case III. *Archiv f. klin. Chir.*, 1909, Band lxxxix, S. 396.



FIG. 9.—A tumor of the umbilicus composed partly of hypertrophic sweat glands. The glands are gathered into definite groups reminding one of the gland arrangement in small fibromata of the breast. The individual glands bear a marked resemblance to ordinary sweat glands. Some of them are dilated. Another portion of the tumor consisted of typical uterine mucosa (see Fig. 10). H. Ehrlich. Primäres doppel-seitiges Mammacarcinom und wahres Nabeladenom (Mintz). Aus von Eiselsberg's Klinik. Archiv f. klin. Chir., 1909, Band lxxxix, S. 746.



FIG. 10.—Uterine mucosa in an umbilical tumor. To the left are characteristic uterine glands, a few of them dilated. They are surrounded by a definite stroma which separates them from the connective tissue. In the right upper corner of the picture are similar glands, the majority of which have become dilated. If we take the lower half of the picture only, it might very readily pass without any description for a representation of an adenomyoma of the uterus. H. Ehrlich. Primäres doppelseitiges Mammacarcinom und wahres Nabeladenom (Mintz). Aus von Eiselsberg's Klinik. *Archiv f. klin. Chir.*, 1909, Band lxxxix, S. 747.

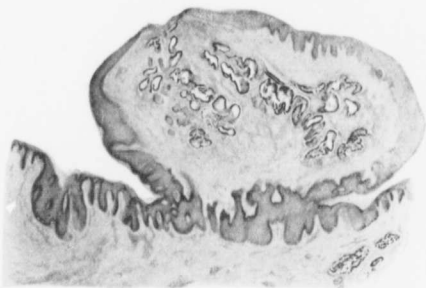


FIG. 11.—A small umbilical tumor containing numerous glands. This is a low power picture of the mass. The growth is covered with squamous epithelium. Scattered throughout the stroma are quantities of glands. In form they bear a closer resemblance to uterine glands than to sweat glands. At one point the glands almost reach the surface. Von Noorden. *Deutsche Zeitschr. f. Chir.*, 1901, Band lix, Fig. 1, Taf. III.



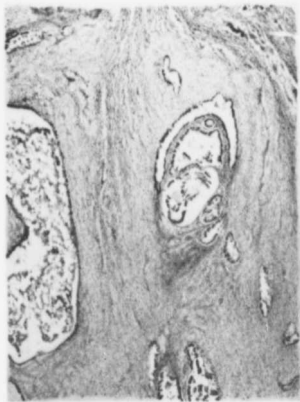


FIG. 12.—Glands in a small umbilical tumor. The glands in the lower left half of the picture bear quite a resemblance to uterine glands. Those in the centre of the field remind one of the pictures seen in the depths of uterine glands, where there is some reduplication of the folds. The gland in the left part of the field is markedly dilated and contains much detritus. Von Noorden. *Deutsche Zeitschr. f. Chir.*, 1901, Band lxx, Fig. 2, Taf. III.

H. Ehrlich, "Primäres doppelseitiges Mammacarcinom und wahres Nabeladenom" (Primary Bilateral Carcinoma of the Breast and True Adenoma of the Umbilicus (Mintz), Aus von Eiselsberg's Klinik), *Archiv f. klin. Chir.*, 1909, Band lxxxiv, S. 742.

The patient was fifty-four years of age and had had no children. She had had an abdominal operation ten years before on account of some uterine trouble. Shortly after leaving the hospital she developed a tumor in each breast, which gradually reached the size of an apple. They caused little difficulty, and in the course of a year did not increase much in size. Simultaneously with the appearance of the tumors in the breasts the umbilicus was pressed upward, markedly by a tumor the size of a hazelnut developing at that point. This growth had remained stationary. The umbilicus had been transformed into a small tumor with pigmented skin. The tumor was hard and was with difficulty pushed over the underlying structures. The umbilical growth and the carcinomata of both breasts were removed. (We are here interested chiefly in the umbilical tumor.)

The tumor of the umbilicus was 3 cm. in diameter. Macroscopically it consisted of a hard, pure white scar-like tissue firmly attached to the skin. Scattered throughout the tumor were a number of pinhead-sized spaces which contained a serosanguineous fluid. Histologically the chief mass consisted of fibrous tissue, poor in nuclei and cell elements. The skin covering the tumor, except that it showed a marked pigmentation of the basal layer, looked normal. The connective tissue of the skin passed directly into that of the underlying tumor. In the tumor were numerous islands of loose connective tissue which varied markedly in the number of their nuclei, and inside this were epithelial elements. There were two definite histological pictures. In the portion lying near the skin (Fig. 9) were groups of closely compressed and tortuous gland loops lined with large cuboidal epithelial cells having small centrally located nuclei. The gland lumina and the basement

membrane of the tubular glands were easily recognizable. Similar glands were also found in the connective tissue. They were undoubtedly hypertrophic sweat glands.

Predominating in the central portion of the extirpated tumor was a second kind of epithelial tissue likewise situated in the loose connective tissue, but exceedingly rich in nuclei. This consisted of tubular glands with high cylindrical epithelium; cilia and goblet cells were not visible. Through the fork-like arrangement of the tubular glands there had originated here and there many bay-like spaces which might be mistaken for papillary formations and which had given rise to cystic formations due to the presence of fluid. Here and there the epithelium of the cystic spaces had disappeared or become flattened. The contents of the cysts were hemorrhagic or showed a formless detritus, and in several places surrounding the cysts were masses of blood pigment. Van Gieson's stain failed to bring out any smooth muscle surrounding the epithelial elements. This was only found in connection with the vessels of the connective tissue, and there not abundantly.

While the glands first described are without doubt hypertrophic sweat glands the glands of the second group are, on account of the character and their epithelium, in all probability derivatives of the intestinal tract. Ehrlich speaks of the growth as an adenoma of the umbilicus.

[The reader will note that, judging from Fig. 9, there is no doubt that the first gland elements described by Ehrlich are sweat glands, and that the tumor consisted of sweat glands. Fig. 10, however, shows everywhere that the second variety of glands can in no way be connected with remnants of the intestinal duct, but that we have here typical uterine mucosa enveloped in a definite stroma.

The cystic spaces, as noted in the text, were partly filled with blood. They are nothing more than glands that have been markedly dilated by old menstrual fluid. This is one of the cases in which the definite uterine character of the mucosa is clearly evident.—T. S. C.]

L. Wullstein, "Eine Geschwulst des Nabels (Kombination von Cystadenom der Schweißdrüsen mit cavernösem Angiom)" (A Tumor of the Umbilicus Consisting of a Cystadenoma of the Sweat Glands and a Cavernous Angioma) Arbeiten aus dem Path. Inst. in Göttingen. R. Virchow, 50 Doctor Jubiläum, 1893, S. 245.

Wullstein says that in the literature he has found no tumor similar to the one he is describing. In 1891 a specimen was sent to the Göttingen Laboratory. This consisted of an umbilical tumor which had developed in the course of three years, and was attached by a thin pedicle which had not been completely removed. The pedicle had extended into the abdominal cavity. The physician in charge had made a diagnosis of myxofibroma. The patient was a sterile woman thirty-four years of age. In addition to the umbilical tumor, another growth was present in the pelvis. This was the size of a fist, was connected with the uterus and had spread out diffusely in the neighborhood of the right broad ligament. It could not be regarded as an exudate. The physician was interested to find out whether there was any connection between the two tumors; in other words, whether the umbilical growth was a metastasis. Wullstein examined a Müller's fluid specimen. It was everywhere covered with skin. It had a semicircular form and was about the size of a dollar. The umbilicus was raised 1 cm. above the surrounding abdominal skin, and its surface showed numerous shallow furrows. The umbilical furrow was recognized as an irregular transverse cleft, which divided the umbilicus into two unequal portions, it becoming deeper and deeper in the middle until there was a depression 11 mm. in depth. About the middle of the under surface of the tumor was a cord about 1 cm. long, hardly as thick as a straw. This was solid and composed of connective tissue. The tumor itself was about 3 cm. long, and averaged 1.5 cm. in thickness. On section it was seen that the umbilicus was everywhere covered with skin which in all portions was thickened and markedly pigmented. From the bottom of the umbilical

depression and running parallel were thick bundles of dense connective tissue. The tumor consisted of numerous dense, hard, glistening connective-tissue bundles which enclosed more or less long or round areas of loose tissue grayish in appearance, and in the interior in places were small lumina. Subcutaneous fat was absent. In the vicinity of the umbilical scar the tissue was sieve-like. The spaces of the meshwork was filled with dark brown masses about the size of poppy seeds. The meshwork consisted of firm connective tissue.

Microscopic examination of a section from the middle of the tumor showed that the epidermis was thickened. The deepest cells of the stratum mucosum were granular, and contained everywhere brown pigment. Only at the base of the umbilicus, where the papillae were not markedly formed, was the pigment absent. Everywhere in the corium and in the subcutis were numerous mast cells. Hair and sebaceous glands were nowhere to be found. The deeper layers of the skin contained normally formed sweat glands. The tumor consisted chiefly of connective-tissue stroma and of cavities varying in size and form. The stroma, which in amount predominated over the alveolar tissue, was composed of broad, thick, dense connective tissue which contained a few cell elements but with spindle-shaped nuclei. Only around the spaces did the connective tissue form a most delicate connective tissue whose fibers formed a network partly as fine bundles. The numerous nuclei were oval and frequently almost round. Immediately around the alveoli the connective-tissue threads formed a thick layer, really a membrana propria. The cavities were lined with cylindrical cells which were placed at right angles. Their height was not always in proportion to the size of the cavity, but seemed to depend on the pressure of the gland contents. In a few places the tubules were filled with epithelium. The gland tubules were usually cut either obliquely or longitudinally. The gland lumina near the periphery of the tumor in their width resembled the normal sweat glands.

On the other hand, those in the middle of the tumor were markedly dilated and round; in the latter the tissue was frequently infiltrated with cells. The majority of the glands were filled with a secretion composed of a most delicate, rather granular network of threads mixed with epithelial cells. The entire tumor was permeated by a thick network of capillaries which surrounded the individual gland tubules. In many places in the connective-tissue stroma in the neighborhood of the bloodvessels were remnants of old and fresh blood.

In the preparations taken from the lateral portion of the tumor accumulations of round cells and bloodvessels were seen. The cystic dilatation of the canals had evidently been produced by pressure from within. The cavities were lined with endothelium and the walls of these new cavities had projections into them. These cavities were due to the confluence of the neighboring small cavities. The origin of these in some places could be followed. At several points between the blood spaces were dilated tubules lined with cylindrical epithelium, and usually filled with secretion, and surrounded by the characteristic connective tissue which sometimes reached as far as the endothelium of the blood spaces. A few of the gland-like cavities also contained blood. At no point, however, was this adherent.

After these findings we must ask: Are we dealing with an individual tumor or is there a combination of two tumors? Further, under what category does this tumor formation belong? Wullstein held it to be a combination of cyst-adenoma of the sweat glands with cavernous angioma.

On page 250 he says what makes him believe that there is a combination of two tumors, is the fact that there is a different lining to the large spaces, the one being lined with endothelium, and the other with cylindrical epithelium. No less typical is the relation of the surrounding connective tissue to the spaces. The differences even with the low power are easily recognized, through the various micro-

chemical reactions in color with methylene blue. The above already described delicate bluish connective tissue is apart from the sweat glands, and their tributaries in the specimen only present in the vicinity of the tubules lined with cylindrical epithelium, while the spaces lined with endothelium are always surrounded by a thick fibrillated tissue which stains intensely red. He thinks that the large cavernous spaces, in the first place are due to circulatory disturbances.

On page 251 he says we must look upon the sweat glands as the point of origin for the epithelium of the newgrowth, on account of the position of the tumor beneath the skin, and on account of the cylindrical epithelium and the absence of squamous epithelial nests. Its origin from the epidermis, or from the hair follicles, or the sebaceous gland, is excluded. On the other hand, we must ask if it is not due to some embryological deposit. Three things come into consideration; the umbilical canal, the urachus, and the omphalomesenteric duct. Have we in this mixed tumor a purely accidental combination of adenomatous cyst of the sweat glands and a cavernous angioma, or do the two varieties bear a causal relation one to the other? In conclusion he says the old and fresh hemorrhage, in various portions of the tumor, have followed as a result of hyperemia, perhaps the menstrual hyperemia.

Wullstein's tumor also occurred in a woman. He speaks of its characteristic connective tissue separating the gland lined with cylindrical epithelium from the surrounding stroma. Further, in his last paragraph he speaks of the hemorrhage through the tumor being due to hyperemia, possibly menstrual in origin. We think that here he has the clue, and in all probability the glands in this case were also uterine glands. While the description of the histological appearance in this case is in places rather involved, we have in our translation held closely to the text in order that the points favoring the uterine origin of the glands might not be unduly accentuated.

I wrote Professor Orth, of Berlin, and he in turn referred

me to Dr. Wullstein, who at the time this case was published (1893) was an assistant of Professor Orth, and occupied the room next to mine in the Göttingen Laboratory. Dr. Wullstein kindly sent me the reprint of his article, but I was unable to get the specimen, and consequently cannot speak with absolute certainty.—T. S. C.]

N. Giannettasio, "Sur les Tumeurs de l'Ombilic" (Concerning Tumors of the Umbilicus), *Arch. Gén. de Méd.*, 1900, n. sér., t. ii, p. 52.

He gives a *résumé* of the literature on tumors of the umbilicus, and reports a case in a multipara, aged forty-four. A year and a half before she came under his observation the patient had noticed a small tumor the size of a nut at the umbilicus. This was solid, immobile beneath the skin and occasioned no discomfort. It occupied the lower and left side of the umbilical depression. It was removed and the patient was perfectly well twenty-five months later. He gives a very good plate, but the text is not satisfactory. The nodule, however, he says contained cytogenous connective tissue. The plate shows normal skin, dilated blood-vessels, and gland spaces lined with apparently cuboidal epithelium and surrounded by a stroma, the picture somewhat suggesting uterine glands.

W. von Noorden, "Ein Schweißdrüsenadenom mit Sitz im Nabel und ein Beitrag zu den Nabelgeschwülsten" (An Adenoma of the Sweat Glands Situated in the Umbilicus, and a Contribution on Umbilical Tumors), *Deutsch. Zeitschr. f. Chir.*, 1901, Band lix, S. 215.

In the beginning of his article he states that he is going to demonstrate a tumor which, from its characteristics and anatomical picture, leaves no doubt that it originated from the sweat glands, and that as far as he knows no similar case is on record. On October 1, 1898, a thirty-eight year old multipara mentioned that for two months she had had a slight unevenness in the middle of the umbilicus. Eight days previously a physician had observed a pea-sized



enlargement in the floor of the umbilicus. Clinically it suggested a nevus, and on account of the dark pigmentation von Noorden thought of melanosarcoma. On October 14, 1898, the tumor was larger than a pea, was semicircular, and was not sharply defined from the surrounding umbilical tissue. In its centre it had a small wart-like elevation. There were no inflammatory changes in the vicinity. The skin over the tumor was somewhat uneven, grayish in color, and here and there more deeply pigmented than the floor of the umbilicus. No pulsation was noted, no variation on pressure. The umbilicus was removed. Two and a half years later the patient was perfectly well.

The umbilicus on section showed a drawing in of the skin, and in the depth there was a wart-like projection. The tissue of the umbilicus itself was very hard. On section a pea-sized light brownish pigmented area was observed, which was not sharply defined from the surrounding tissue.

*Microscopic Examination.* The nodule was made up of a loose connective tissue with numerous large cells. It contained a large number of capillaries. Within this connective tissue were slit-shaped cavities lined with cylindrical epithelium, which has been loosened irregularly from the wall. Some of these cavities had become dilated into irregular cystic spaces which here and there showed clearly a lining of cylindrical epithelium, while in other places they had completely lost it. The contents of these cavities had dropped out in some places, in others it consisted of cylindrical epithelium, and in numerous cases of an irregular structureless network. Further sections were made, and the squamous epithelial layer over the entire nodule was found to be intact. Over the most prominent part it was three times as thick as at the periphery. Where the cells were most abundant the deepest layers showed pigmentation. At one point, Fig. 11, the sweat glands could be traced almost to the surface, being covered only by a few layers of cells. The stroma consisted of three definite kinds of tissue; normal tissue, dense fibrous tissue, and

mucoid-like tissue. The chief interest lay in the sweat glands; roots of hair were nowhere to be found, and sebaceous glands were reduced to a minimum. The search for muscle fibers in the reticulated tissue was fruitless. No elastic fibers were found. In general it may be said that the sweat glands were normal in the subcutaneous layer, and were arranged in groups. Then in one section, one would find two large openings and three or four glands, and in another section groups of from two to four glands. Some were cut in such a manner that nine to fifteen round lumina were in a line or in the form of a hook. The groups lay, as a rule, very close to one another. The normal sweat glands lay partly in the fibrous connective tissue, others—and this is to be noted—were separated by a rather broad layer of cells from the normal corium. The nuclei of this zone were pale and less abundant than in the remaining corium. This zone suggested the above-mentioned mucoid tissue in which in part the altered glands lay. This tissue appeared always to penetrate between the normal gland grouping, and had separated the glands from one another. The gland epithelium was not changed. In addition to this slightly normal and slightly changed skein-like gland there were in the corium a number of cavities and tubules. These extended from near the surface of the papillary masses to the vicinity of the subcutaneous fat. The cavities and the tubules are to be seen in Figs. 11 and 12. [We do not clearly understand what von Noorden means by corium. It seems, however, that he uses it instead of stroma. His general description is somewhat hazy throughout.—T. S. C.]

On page 222 he gives a *résumé* of his description: The tumor is made up of many roundish and often dilated cyst-like portions, which lie deeply seated in the corium. In intimate relation to these, or independent of them, are tubular channels with numerous cork-screw-like windings. These reach toward the epidermis. The cystic and also the tubular pictures are surrounded by dense and loose

connective tissue, which separate them from the surrounding connective tissue, and are without any definite capsule. In the above described coil we, without doubt, recognize the sweat glands.

On page 229 he reports one of Mintz's cases, and says that possibly the newgrowth had developed from the glandular portion of the skin, for example, from the sweat glands. He says: "I will also not assume this, but will say that portions of my tumor in respect to form, grouping, contents, and relation to the cells, both in the description and in the picture, produce a very similar appearance to the case reported by Mintz, and had it not been possible to establish a relation to the sweat glands, I should in all probability have followed the views of Mintz. Mintz found smooth muscle fibers in the connective tissue at several points. The explanation as to the origin is difficult." In conclusion von Noorden says: "From the above findings a true benign adenoma springing from the sweat glands can be diagnosed."

As will be noted from the history the patient was a woman, aged thirty-eight years. There was no evidence of inflammation. Histological examination in some places showed groups of glands surrounded by a stroma differing from the ordinary surrounding stroma. These groups of glands were lined with one layer of cylindrical epithelium, and the cavities of some of the dilated spaces contained cells that had taken up blood pigment. Von Noorden draws attention to the fact that his case bore a marked resemblance in many ways to Mintz's case. There remains little doubt in our mind that the glands resemble those found in the body of the uterus, and the thickened dense stroma around them bears a marked resemblance, even with the very low power, to the stroma of the uterine mucosa. The picture, at any rate, is much more suggestive of glandular growth of the uterine origin than of one coming from the sweat glands. I endeavored, through Professor

Döderlein, of Munich, to locate Dr. von Noorden, and if possible secure a section of this growth, but have not been able to do so.—T. S. C.]

It is rather difficult to classify this tumor, but as it presents a few clinical and histological points suggestive of the group under consideration, I mention it here, although it is not considered in the digest.

Villar, "Tumeurs de l'Ombilic," *Thèse de Paris*, 1886, Observation 68. L. L., aged forty-six years, entered the service of Professor Guyon September 17, 1886. In the month of December, 1885, nothing abnormal was noticed in the umbilical region, but shortly afterward her corsets produced pain in this region, and she discovered a small tumor the size of a pinhead, reddish in color, in the umbilical depression. This tumor increased very slowly, and in May, 1886, she went to the hospital for examination. She continued under treatment, and in the month of August entered the hospital. At that time at the umbilical depression was a tumor the size of a bird's egg. It was conical. Its base was continuous with the cicatrix, and was somewhat constricted by the depression. It had a very narrow but relatively large pedicle. It was in reality sessile, firm in consistency, but elastic and reddish in color. At the top was a blackish point 2 mm. in diameter. The tumor itself was not ulcerated and did not discharge any liquid. Two or three days after she entered the hospital the blackish point ruptured, and there was an escape of tarry blood. The patient experienced no pain, and there was no nodular enlargement.

*Histological Examination by Clado.* The tumor is situated in the centre of the umbilicus and has developed in the depth of the cicatrix. It is covered with skin. In consistence it is a little less firm than a fibroma. On section one finds a capsule which surrounds the central mass. The tumor is whitish gray, with numerous dark spots, not any larger than the head of a pin, scattered throughout it. Micro-

scopic examination shows that the tumor is formed of sarcomatous tissue, the cells being fusiform in shape. Some of the spaces are round, others oval and have anastomosed with one another. Some of the canals are lined with pavement epithelium. Between the cystic spaces one finds stroma containing a small number of vessels. The skin which composes the outer covering of the tumor is exceedingly thin, but presents the characteristic appearance. There has been extravasation of blood at the centre of the tumor.

[This woman, as above noted, was forty-six years of age. The history does not convince one absolutely that this is a sarcoma. It might very well be a fibroma. It resembles, in a few particulars, those tumors of the umbilicus that contain uterine glands, or glands faintly resembling them. —T. S. C.]

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**A PSEUDOHERMAPHRODITE**

By **THOMAS S. CULLEN, M. B., Baltimore, Maryland**

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## A PSEUDOHERMAPHRODITE

By THOMAS S. CULLEN, M. B., BALTIMORE, MARYLAND

CASES of this character are encountered from time to time, but are by no means common. As we had an excellent opportunity of studying this one carefully and as we were particularly fortunate in having most faithful illustrations by Mr. Brödel, I have thought it wise to place the salient features on record.

On May 7, 1902, I was summoned by Dr. E. R. Trippé of Easton to see a case of strangulated hernia, which he said needed immediate attention. The patient (N. C.) had had a hernia for several years and had been wearing a right-sided truss. The hernia had frequently come down for a short time but had always been reduced without much difficulty. This time it had been down for nearly a day and attempts to return it had proved futile. I advised immediate operation.

The following note was made: "The patient's general expression is half masculine. The face is well developed and shows a comparatively heavy beard. The upper lip resembles that of an adult male. In the median line the beard extends half way down the neck. The Adam's apple is not well developed or, at least, not at all prominent. In general appearance the hair over the head is that of a female; it is about eighteen inches long. The voice is masculine in type. The chest development is more masculine than feminine. There is a moderate amount of hair over the sternum; the mammary development is slight and there is a moderate amount of areolar pigment around the nipples and along their lower margins is a good quantity of hair.

The fingers are long and slightly more feminine than masculine in type. The thumbs, however, are distinctly masculine. The forearm and arm are fairly well covered with hair. The umbilical fossa is deep. The pubic hair is well developed and in the median line and also laterally extends upward to a point 2 cm. above the umbilicus. The legs and thighs are well covered with hair and are masculine in appearance. (Fig. 4.) The labium majus on the left side is well developed. On the right side it is also well formed in the lower portion but at the upper part is stretched out over a tumor that extends down from the inguinal region. No clitoris is to be recognized but in its place appears an organ suggesting a penis two inches in length and  $2\frac{1}{2}$  inches in circumference. (Fig. 1.) This can be traced to the lower border

of the symphysis where it is recognized as a small cord. The glans is  $1\frac{1}{2}$  inches in length,  $1\frac{1}{2}$  inches from side to side. It is well developed in the upper portion. The lower portion shows a distinct furrow  $\frac{1}{16}$  inch in depth and  $1\frac{1}{2}$  inches in length and ending  $\frac{3}{4}$  inch above the meatus in a ridge. (Fig. 2.) The mucosa lining the furrow appears more delicate than that covering the glans. The prepuce is well developed and can be drawn down to cover fully one-third of the glans. The urethra proper is situated just below and posterior to the ridge commencing at the proximal end of the groove in the penis. It is distinctly female in type, and  $2\frac{1}{4}$  inches in length.

The hymen is represented by a ragged ridge composed of numerous tags forming an elevation about 1 mm. in height around the vagina. The finger enters the vagina to a distance of  $1\frac{1}{2}$  inches. Laterally the mucosa is smooth, but posteriorly there is a considerable amount of scar tissue. The width of the vagina is 2 inches. Laterally it extends up to the pubic bones. No cervix can be made out and on bimanual examination no pelvic organs can be detected. The recto-vaginal septum is normal as far as it goes.

The mass in the right inguinal region extending downwards to the right labium majus is 7 inches long and on an average 3 inches in breadth. (Fig. 1.) It is elastic and everywhere resistant and can be pushed upward and downward over a wide area. The lower two-thirds are dull on percussion but no definite solid mass can be detected.

Operation at the Church Home and Infirmary, May 8, 1902. An incision was made over the tumor and by transmitted light the sac was seen to contain a good deal of fluid. This proved to be turbid, and of a yellowish color. Occupying the sac and projecting through the external ring was a knuckle of gut fully 4 cm. in diameter, also a testicle and a portion of the epididymis. (Fig. 3.) As we were rather doubtful about the condition of the gut at the point of constriction, an incision was made higher up in the abdomen. The inguinal canal was opened and, the internal ring having been severed, it was found that a loop of intestine fully 8 inches long had formed the hernia. As it was impossible to return the testicle, this together with the redundant sac was removed. The peritoneum was closed with catgut. Just over the femoral artery was a slight area of oozing

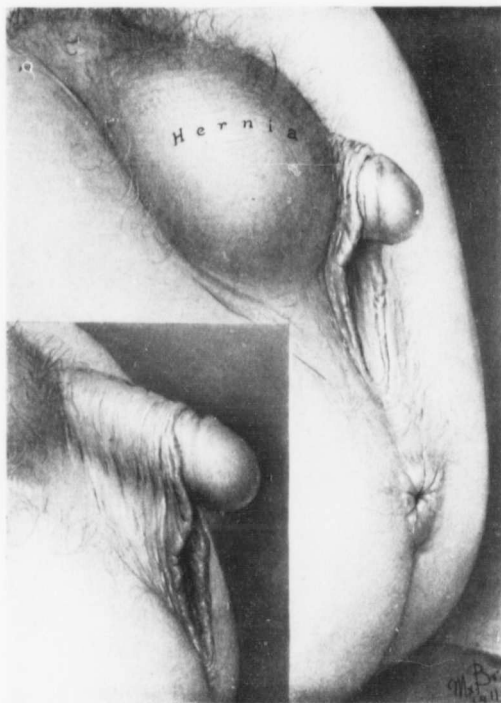


Fig. 1. Right-strangulated inguinal hernia in a pseudohermaphrodite. The hernial sac is of moderate size and is encroaching on the right labium. The labia are continued upward forming the rudimentary prepuce.

In the sketch in the left lower corner the hernial sac has been pushed up exposing the penis which is over 2 inches long. The glans is well formed in its upper portion and the prepuce could be drawn down so that it covered one-third of its surface.

For the under surface of the penis see Fig. 2; for the contents of the hernial sac see Fig. 3.

which was rather difficult to check. Here we introduced a delicate drain of iodoform gauze. The abdominal walls were closed with silver wire, catgut, and subcutaneous silkworm gut. The patient stood the operation well. Before the abdomen was closed the pelvis was carefully examined and no trace of uterus, tubes, or ovaries could be found. On the left side a testicle could

be clearly made out in the upper part of the inguinal canal, pressure upon which occasioned considerable pain. The patient made a speedy recovery.

On histological examination the testicle showed some minor changes. The gland epithelium was swollen, the cells closely suggesting the large squamous epithelial type; there was no evidence



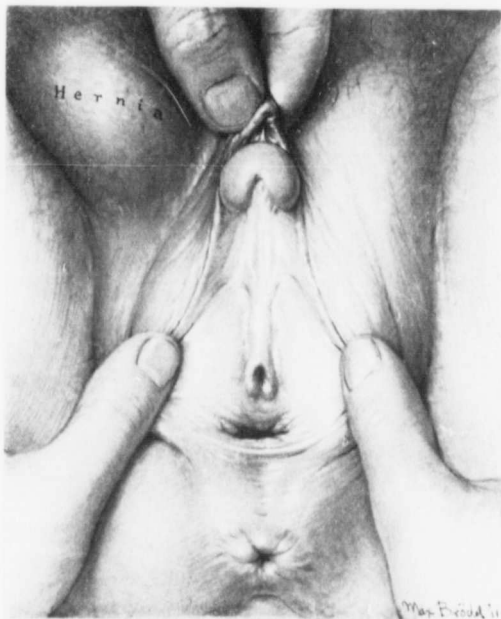


Fig. 2. The imperfectly formed urethra in a pseudohermaphrodite. The glans penis is perfectly formed in its upper portion and above is provided with a rudimentary prepuce formed by the labia. The penile portion of the urethra is recognized in part as a groove, in part as a ridge. The urethral orifice is of the female type and is freely patulous to the bladder. The vagina is  $1\frac{1}{4}$  inches deep and ends in a blind pocket. There is no evidence of a cervix.

of spermatozoa. The stroma of the testicle was increased in amount.

The epididymis was little altered.

#### ANATOMICAL POINTS OF DIFFERENCE BETWEEN THE NORMALLY FORMED FEMALE AND OUR PATIENT

Mr. Brödel, who had just read Stratz's book<sup>1</sup> on the female human body, suggested that it might be of interest to compare the superficial anatomical landmarks in our case with those laid down by Stratz as constituting the normal in the female. The accompanying tabulations give the

interesting results as determined by Mr. Brödel after a most careful examination.

MEASUREMENTS OF AVERAGE-SIZED FEMALE (A) AND LARGE FEMALE (B) COMPARED WITH PROPORTIONS IN OUR PATIENT (C), THE BODY LENGTH OF B AND C CORRESPONDING.

	A	B	C
	Normal female of av. size	Normal female of size of our patient	Measurements of our patient
Length of body	168 cm.	183 cm.	183 cm.
Weight of body	132 lbs.	148 lbs.	170 lbs.
From nose to symphysis (length of spinal column)	62.5 cm.	68.5 cm.	71.5 cm.
Length of head	21 cm.	23 cm.	24 cm.
Width at temples			13 cm.

<sup>1</sup>Stratz, C. H. *Die Schönheit des Weiblichen Körpers*. Stuttgart, 1900.

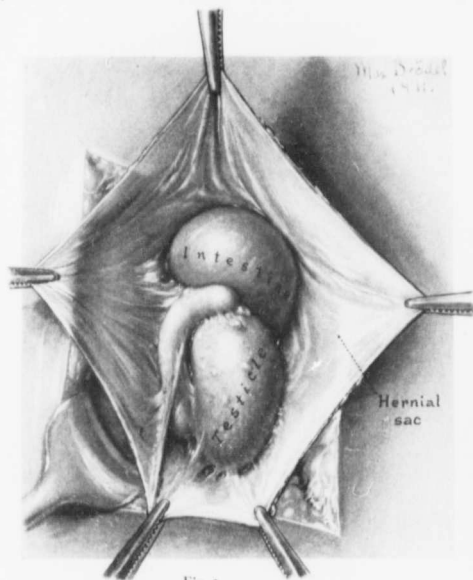


Fig. 3.

Fig. 3. The contents of a hernial sac in a pseudohermaphrodite. This mass was 7 inches long and 3 inches broad. It contained a considerable amount of turbid yellow fluid, a loop of small distended bowel, and the right testicle and epididymis. After the hernial ring had been cut, the bowel was reduced, but the testicle and epididymis were so firmly adherent to the sac, as noted in the picture, that it was necessary to remove them.



Fig. 4.

Fig. 4. Distribution of hair in a pseudohermaphrodite. The healed scar is readily seen. The pubic hair was well developed and extended upward a short distance above the umbilicus. The photograph does not show this very clearly. The legs were thickly covered with hair conforming closely to that of a male.

Leg (great troch.)	90 cm.	98 cm.	94 cm.	Nipples (center to center)	23.5 cm.	26 cm.	21 cm.
Circumference of chest	88.5 cm.	96 cm.	96 cm.	Nipple to umbilicus	28 cm.		
On inspiration			88 cm.	Sym. to spinous process of 5th lumbar vertebra			23.5 cm.
On expiration			84 cm.	Arm			
Width of shoulders	38.5 cm.	42.5 cm.	33 cm.	Length of humerus (axis of joints)			29 cm.
Center of			33 cm.	(axis of joints)			29 cm.
Humerus			32.5 cm.	Length of forearm (axis of joints)			29 cm.
Acromion process			40.5 cm.	Length of hand			20 cm.
Skin measurements			74 cm.	Circumf. of humerus			27 cm.
Width of waist	21 cm.	24 cm.	27 cm.	Circumf. of forearm			25 cm.
Circum. of waist			74 cm.	Leg			
Width of hips at crest of ilium	34.5 cm.	38 cm.	31 cm.	Length of thigh (axis of joint)			44 cm.
Width at level of great trochanter	34 cm.	38 cm.	32 cm.	Length of thigh from ant. sup. sp. to bottom of knee-cap			51 cm.
Pelvis between anterior superior spines	26.5 cm.	29.5 cm.	27 cm.	Length of leg			44 cm.
Between post. sup. spines	42 cm.	43.5 cm.	41 cm. <sup>1</sup>				

<sup>1</sup> Angle with central skin fold 90° (sacral triangle).

CULLEN: A PSEUDOHERMAPHRODITE

5

Height of foot	6 cm	Eye sockets, large	Small
Length of foot	24.75 cm	Eyebrows, small	Heavy, bushy
Circumf. of thigh	10 cm	Lower jaw, delicate	Strong — prominent
Circumf. of calf	44 cm	Lines from cheek to neck, graceful	Sharply demarcated

SECONDARY SEXUAL SIGNS OF FEMALE

Normal	Conditions present in our nation:	Neck, rounded	Prominent cartilages and muscles
Delicate bones	Heavy bones	Waist, slender and graceful	Heavy
Rounded forms and contours	Mostly hard and angular	Hand small and narrow	Fairly small
Prominent breasts	Flat — male type	Shoulders rounded and sloping	Bony, broad shoulders
Pelvis broad	Narrow — male type	Clavicles, small and straight	Heavy, male type
Luxuriant hair on head	The same	Chest, long and narrow	Broad, male type
Transverse low margin of pubic hair	Extending upward in midline	Buttocks, prominent	Small, male type
Little hair in axilla	Much hair	Thigh, thick and rounded	Relatively thin, male type
No hair on face and body	Much hair	Loos pubic curve	The same
Tender skin	Thick skin	Rounded contours of knee	Angular
Rounded, delicate skull	Long, angular skull	Calf, rounded	Angular
Small face	Large face	Ankle, delicate	Heavy
		Feet and toes, small	Large
		Second and fifth toes, long	The same

**ADDRESS IN GYNÆCOLOGY**

BY

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## ADDRESS IN GYNÆCOLOGY

BY THOMAS S. CULLEN, M.B.

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Associate in Gynæcology, Johns Hopkins Hospital*

TO visit London is always a pleasure, to come as an invited guest to the Canadian Medical Association in the Forest City an honour which I deeply appreciate.

This evening I want to briefly outline the various methods adopted to educate the public as to the early recognition of cancer, and to impress upon them the fact that in the early stages of the disease many patients can be permanently cured.

For several years the medical profession has been fully cognizant of the fact that the laity has a false idea about cancer, namely the widespread feeling that it is a blood disease and that consequently it cannot be cured. It is our duty to impress upon them the fact that in the beginning it is a strictly local process, a process that is amenable to surgical treatment.

Several earnest campaigns have been waged during the last few years. The various committees have devoted their attention mainly to pointing out to the family physicians what might be accomplished by early operation and urging the physician to send his patient at the earliest possible moment to the surgeon. Notwithstanding the splendid efforts in this direction little has been accomplished, not because the physicians were necessarily negligent, but because the patients did not present themselves until the disease was far advanced. It was finally realized that if satisfactory results were to be accomplished the message must be carried directly to the people. It was pointed out that fifteen or twenty years ago it was exceedingly difficult to prevail upon persons with appendicitis to be operated upon; now with the knowledge they have, after appendicitis has been diagnosed, operation is at once sought, and the only question asked by the patient or his relatives is—to what hospital shall I go? When the laity are made fully aware of the cancer situation they will on the first sign of the disease present themselves for examination and will gladly avail themselves of surgical aid.

Delivered at the Annual Meeting of the Canadian Medical Association, London, Ontario, June 1913.

At the meeting of the Clinical Congress of Surgeons of North America, held in New York City in November, 1912, a cancer campaign committee was appointed mainly through the efforts of Dr. Franklin H. Martin of Chicago. The committee was instructed to write, or have written, articles on the subject of cancer and was further instructed to have these published in the daily press, the weekly or monthly magazines, as might be deemed most expedient. The committee has gone cautiously, and through the aid of that master organizer and medical editor, George H. Simmons, was able to enlist the cooperation and support of some of the most representative magazines in the country. Mr. Bok, editor of the *Ladies' Home Journal* and Mr. Harriman, managing editor of the same journal, manifested the deepest interest in the campaign. After much thought they came to the conclusion that a lay writer could better reach the public ear, and they naturally selected Mr. Samuel Hopkins Adams, who was such a dominant factor in the campaign against patent medicines, and who was last week made an associate member of the American Medical Association in recognition of his splendid crusade. Mr. Adams visited various surgical clinics throughout the country and then wrote a most comprehensive article on the subject. His first article was published in the *Ladies' Home Journal* for May, 1913. It is well worth a thorough perusal not only by every layman, but also by each member of the medical profession. *Collier's Weekly* for April 26th, 1913, and the May number of *McClure's Magazine* also contain admirable articles on the same subject from Mr. Adams' pen. The medical profession is under a deep debt of gratitude to Mr. Bok, Mr. Harriman, Mr. Collier and Mr. McClure for so freely opening their pages for the enlightenment of the public on this very important subject.

It has been estimated that these three articles reached a reading public of between eight and ten millions. *Harper's Weekly* for March 29th, also contained a timely article urging cancer patients to be operated upon without delay. Abstracts from the magazine articles appeared in many of the daily papers throughout the country. The *Baltimore Sun* contained a full column, the *Baltimore News* and the *Baltimore American* each devoted ample space to the subject. The *New Orleans News-Item* gave a full abstract of Mr. Adams' article from *McClure's* and the *Detroit News-Tribune* for Sunday, April 27th, 1913, with the permission of the *Ladies' Home Journal*, copied Mr. Adams' article in full. I have just mentioned a few of the daily papers that have given this matter

wide publicity. The entire press of the country has been most liberal in its dissemination of our knowledge of cancer. This support was not confined to the papers of the United States. The Canadian papers have also strongly emphasized the necessity of patients suffering with cancer having their ailment attended to promptly. I have splendid clippings from the daily press of London, Toronto, Montreal, St. John, N.B., Winnipeg and Vancouver. Our committee wishes to express our deep sense of appreciation of the hearty support given us by the press of Canada and of that of the United States in the dissemination of this knowledge, and we feel confident that they will gladly continue to publish any new data on the subject, until every one on the continent has a clear idea of just what cancer is, what its early symptoms are, and how they can best be treated.

An advertiser is naturally looking for results, and in like manner the cancer campaign committee was anxious to find out what influence Mr. Adams' article had had on the community at large. It was not long before they were forthcoming. I will relate just a few of them to you. Within a week after the appearance of Mr. Adams' publication a colleague of mine told me that he had just operated upon a patient with cancer of the breast. The nodule was not larger than a pea. When asked why she came so early, she said that she had just read the article in the *Ladies' Home Journal* and felt that it was unwise for her to delay,—the outlook in this case is excellent. Another colleague had for weeks been urging a patient with cancer to be operated on, but to no purpose. Within three days after the appearance of the article which she had carefully read she entered the hospital and was operated upon. Dr. C. Jeff Miller, of New Orleans, wrote me that, as a result of the *Ladies' Home Journal* article, a lady soon came to him with an early cancer. Dr. T. C. Kennedy, of Indianapolis, under date of May 13th, 1913, writes. "A lady out in the state noticed a lump in the left breast. Seeing the article in the *Ladies' Home Journal* she immediately consulted her family physician who referred the case to me. I operated on her at St. Vincent's Hospital last Thursday, doing a Halsted. Here is a case that has a good chance of getting entirely well, as it was taken early."

Dr. Franklin H. Martin, of Chicago, early in May of this year saw a beginning carcinoma of the breast. The husband had just read the article in the *Ladies' Home Journal*, and insisted on his wife consulting a surgeon. Dr. Martin removed the entire breast and the axillary glands, and feels sure that the outlook for a permanent cure is an excellent one.

My experience as to the strong impression made by Mr. Adams' article has been similar to those already related. In one morning I saw three patients from widely different points, one from New Orleans with some bleeding due to slight pelvic inflammation, another from Alabama with some bleeding due to a prolapsus, and a third from Maryland, with a small, but benign tumor of the breast. Each had read Mr. Adams' article, and each hastened her visit as a result of this article. All were afraid of cancer and in each case I was able to relieve the patient's mind, telling her that no malignancy existed. Two of these three patients required minor operations.

From what you have heard, the knowledge of cancer has already been widely disseminated and it is bound to bear fruit. The more the subject is investigated the clearer it becomes that if the women of the country are made aware of what can be done if cancer patients apply early for treatment, it will be unnecessary to pay much attention to the men. If men are sick, unless very ill they pay no attention to it, and only after they are urged by their mothers, wives, sisters or daughters, do they seek medical aid. As a matter of fact the woman is the health guardian of the household.

*Skin cancer.* Cancer of the skin is easily and promptly recognized and is usually soon brought to the attention of the physician.

*Cancer of the lip* is also soon discovered by the patient and as a rule the physician's advice is sought early. While in many instances wide excision of the growth is at once advised, yet it is appalling to find the number of patients that are still treated in a palliative manner. Only a few months ago a friend drew my attention to an ulcerated area on his lower lip. His associates had not noticed it because of his long moustache. On questioning him I was surprised and distressed to learn that a supposedly competent physician had been burning the "ulcer" every few days for fully two months. Very valuable time was lost. Within a few days the growth and the glands of the neck were removed. These glands were on microscopical examination found markedly involved by cancer, and the patient's ultimate outlook is a very gloomy one.

*Cancer of the tongue.* Any growth of the tongue naturally calls for immediate intervention. My colleague, Bloodgood, has frequently drawn attention to the small white patches on the lip or tongue of smokers. He looks upon these as precancerous lesions, and if after a week or two they still persist, then he advocates their immediate removal.



*Cancer of the stomach* is one of the very frequent varieties of cancer. In the late stages, to be sure, it can be diagnosed from blood in the stomach contents, the reaction of the stomach juices, and by the co-existent nodule that can in some cases be detected. In the early stages of the disease, however, most of these signs are wanting, and it is only in the early stages that a reasonable hope of a permanent cure can be thought of. In the right upper abdominal quadrant we most frequently find gall-stones, duodenal ulcer, or cancer of the stomach. Any marked disturbance in this region calls for prompt operative interference. A delay in a case of cancer of the stomach until definite signs are present usually means a delay until the case is advanced too far for operation.

*Cancer of the intestine* may be detected early if the growth partially or almost completely blocks the lumen of the bowel, or if it be associated with a great deal of bleeding. Sometimes when the patient is thin the nodule can be palpated. In stout individuals, however, the cancer may have extended far before symptoms sufficiently definite to enable one to make a diagnosis, are present. If there be any obscure abdominal condition present, and if this does not yield promptly to treatment, then an exploratory operation should be promptly undertaken, as many valuable lives may in this manner be saved, lives that would be absolutely doomed if delay were advised.

*Cancer of the rectum* usually gives its tell-tale warning in the form of blood or of pain on defecation, and its recognition is not difficult.

I have referred only to the more common varieties of cancer; time will not permit me to discuss the subject in detail.

If we are successful in our cancer campaign, and of this there is not the shadow of a doubt, then we must be prepared to give these patients the best possible service. We must be able to diagnose accurately the borderline cases, and then when cancer does exist we must do such an extensive and thorough operation that the patient is given the maximum chance for a permanent cure.

In cancer of the skin, lip, tongue and rectum a diagnosis can usually be readily made by the surgeon in his regular examination. Cancer of the stomach can in the early stages be detected, as a rule, only with the possible assistance of the Roentgenologist, and mainly by an exploratory abdominal operation. The two chief classes of cancer that require expert pathological knowledge are cancer of the breast and cancer of the uterus.

*Cancer of the breast.* All surgeons meet with many nodules

in the breast. Some of these are definitely fibrous in character, others are definitely cancer, while not a few are on the borderline and can only be positively diagnosed on microscopic examination. It is wise to remove all breast nodules, but where malignancy exists it is imperative to do a most thorough and complete removal of the breast, pectoral muscles, axillary glands and fat. Bloodgood, after the most careful and painstaking study of the cases at the Johns Hopkins Hospital, has found that to remove a piece of cancerous breast for microscopic examination and then delay several days or a week for the pathologist's report is a most dangerous procedure, as nearly all of these patients have a recurrence. The cutting into the growth allows such a widespread dissemination of the cancer that the subsequent operation is of no avail. Consequently, in case of doubt a piece should be cut out and examined immediately, the area of the excision in the meantime being treated as a contaminated area, and if cancer is reported the breast is removed at once, the delay occasioned by the microscopic examination not having taken over ten to fifteen minutes at the outside.

There are many good surgeons through the country, but few good surgical pathologists, except in the teaching centres. The time is speedily coming when every hospital will have a trained and expert surgical pathologist on its staff, a man whose advice can be had at every operation. He will prove to be one of the hospital's most valuable assets. Some may ask why we have not more such men. The truth is that the young physician must make a livelihood, and as the pathologist receives as a rule a mere pittance for his work, few have the scientific perseverance to enter this field. This field must be made sufficiently remunerative to induce plenty of capable men to enter it. When once they embark upon it, learn what a fascination there is in following an individual case to its very rock bottom, obtain here and there a clue enabling them to forecast with a degree of definiteness and precision whether this or that patient will recover, and even every now and then discover something that has never been known to medical men before, then you will find men that will never give up the study of surgical pathology.

When I started medicine a quarter of a century ago, asepsis was slowly creeping into Ontario, and Lister's carbolic spray was still in vogue. We examined very little operative material microscopically in those days. The time is rapidly drawing near when every surgeon, before he becomes a real surgeon, must have as thorough a grounding in surgical pathology as he now has in the

principles of bacteriology. Many conditions that are now obscure to him, after months of study of their finer structure in the laboratory are readily recognized with the naked eye. On opening the abdomen, whether in the clinic or in a small country house, he is always thoroughly familiar with whatever panorama the abdomen in the individual case may unfold. In one case he will find a small nodule not larger than a pin-head; this will give him a clue as to some pathological condition tucked off in a remote corner of the abdomen. In another operation he will at first glance think the case inoperable but will notice some small familiar nodule partially buried in adhesions. He knows from past laboratory experiences that this is benign, and will go ahead and finish his operation. A high building requires deep foundations. Few surgeons of the future will attain marked renown unless these foundations consist in a thorough knowledge of surgical pathology, the material that they are daily confronted with.

*Cancer of the uterus.* Bleeding from the uterus that cannot be satisfactorily accounted for should always excite suspicion. On vaginal examination it is frequently possible to make out a uterine tumour. When the uterus is fairly normal in size and not nodular, and the cervix is normal, then of course the organ should be dilated and curetted. Before undertaking to make a diagnosis from scrapings one should have a thorough knowledge of the appearance of the normal endometrium at or between the periods, during pregnancy, and in old age; each is different and yet perfectly normal.

*Hyperplasia of the Endometrium.* I want to draw your attention to a common, and yet little mentioned, pathological condition of the endometrium causing exceedingly free bleeding at the period, and often reducing the patient's hæmoglobin to a very low point. The first cases of this kind that were brought to my attention came independently from Dr. F. R. Eccles and Dr. H. Meek, of this city, in 1895. These cases were reported in "Cancer of the Uterus," page 479, published in 1900. These patients are usually from thirty-five to forty-five years of age, but I have noted the condition in girls in their teens. The flow is excessive and the menstrual periods may be almost continuous, there is usually no intermenstrual discharge, however. The mucosa is much thicker than usual. On microscopic examination the surface epithelium is found intact. Some of the glands are very small, others much enlarged. The large glands may be either circular or tortuous. All are lined by thickened epithelium and the stroma is excessively cellular. Often the nuclei of the stroma cells contain nuclear figures. Scattered

throughout the stroma are frequently found large venous sinuses some of which are thrombosed. Cancer of the body of the uterus is diagnosed from its pattern and, secondly, from the changes in the individual cells. Gland hyperplasia histologically bears absolutely no resemblance to it.

Where carcinoma of the cervix exists the small cauliflower outgrowths from the cervix or the area of ulceration leave little doubt as to the diagnosis. If one is not certain, then a small wedge of cervix is removed and examined, preferably at once.

While speaking of carcinoma of the cervix I wish to draw your attention to a pelvic tumor that has thus far in the main escaped notice. Dr. D. S. D. Jessup, of New York, recently sent me a specimen of two tumours each of which had the same characteristics. In each case the tumour was attached to the cervix and grew into the rectal wall. Both growths were so firmly fixed that while the surgeon was doing a complete abdominal hysterectomy he had to remove at the same time a piece of rectal wall with the cervical growth. In both cases the tumour consisted of myomatous tissue with uterine mucosa scattered throughout it. In the February number of the *Proceedings of the Royal Society* is a report of two similar cases by Dr. Cuthbert Lockyer, of London.

I have had two cases which belong in this category. In the first case the myoma had not as yet become firmly grafted on to the rectum. In the second case the adenomyoma filled the left broad ligament, and on account of the patient's extreme weakness it could only be removed in part. I feel confident that, when all rectal growths are carefully examined histologically, some supposedly carcinomatous growths will prove to be adenomyomata. These cases are of so much interest that I will give them somewhat in detail.

CASE 1. *Myomata of the Uterus; Adenomyoma between the Cervix and Rectum and associated with Rectal Adhesions.*

Mrs. G. P., seen in consultation with Dr. Samuel T. Earle, March 17th, 1911. This patient had several small polypi in the rectum. The uterus lay back on the bowel and was apparently adherent. On March 22nd, of the same year, Dr. Earle burned off the rectal polypi. These were five or six in number and situated directly behind the cervix. Microscopic examination of these showed that they had been undergoing definite inflammatory changes, as evidenced by the quantities of polymorphonuclear leucocytes on the surface, and by the fact that the underlying stroma contained great numbers of small round cells.

After Dr. Earle had finished his operation I opened the abdomen. The rectum was found adherent to the posterior surface of the uterus low down. On the left side was a corpus luteum cyst. This had evidently ruptured at some previous time, as the surrounding tissues were stained a dark brown. We did a complete hysterectomy removing the uterus and appendages. I then shelled out a small myoma 1 cm. in diameter from the left side of the pelvic floor and another 3 cm. in diameter with a secondary nodule 1 cm. in diameter lying on its surface. This combined nodule was situated between the rectum and vagina on the left. The patient made a perfectly satisfactory recovery. At a later date, however, she had definite renal trouble as evidenced by pus from both kidneys. X-ray examination showed a calculus in the pelvis of each kidney. As the left kidney had apparently given more trouble than the right we removed the stone from that kidney. The stone in the right kidney the patient still has, as it has given her very little trouble.

Pathological report, No. 16079. The uterus itself is little enlarged. Scattered over the outer surface of the organ are several small fibroids. On microscopic examination the endometrium shows definite endometritis. The larger nodule lying between the cervix and rectum is  $4 \times 3 \times 2$  cm. and the smaller one 1 cm. in diameter. The larger nodule on histological examination consists in the main of typical myomatous tissue, but at one point in a cleft are islands of typical uterine mucosa and at another point is a miniature uterine cavity. The smaller nodule only contains one or two gland-like spaces. From the history it will be noted that in this case the cervix was adherent to the rectum. We have here a connecting link between the ordinary adenomyoma of the uterus and an adenomyoma involving the rectum. It is the only case that I have ever seen showing this stage.

CASE 2. *Adenomyoma in the left broad ligament and intimately blended with the rectum.*

Mrs. G. S., admitted to the Johns Hopkins Hospital, June 4th, 1913. This patient is thirty-seven years of age, and two years ago was operated upon in San Francisco, a myomatous uterus and enlarged ovaries being removed. At that time it was necessary to also remove a small portion of the rectum on account of dense adhesions.

Since operation she had had a great deal of pain in the lower abdomen and has for months had almost continual bleeding from the cervix. On her admission to the hospital I found thickening

posterior to the cervix, also induration in both broad ligaments. Although she was in a very weakened condition from the continuous loss of blood we felt that something must be done. The cervix was dilated, and on curetting we brought away what on microscopic examination proved to be perfectly normal uterine mucosa. The supravaginal hysterectomy had evidently been a high one. The right broad ligament was indurated and board-like, and on the left side there was also thickening.

A few days later we explored the abdomen. When the operation was commenced her pulse was 145. We found the rectum densely adherent to the bladder, and the left broad ligament was filled out by a rather cystic growth. Those assisting at the operation thought that we were dealing with a malignant growth which had spread into the broad ligament. In order to determine definitely I cut the round ligament and separated the folds of the broad ligament, and found we were dealing with a cystic mass 6 cm. in diameter. This was gradually shelled out from its attachment to the rectum, but by this time the patient's pulse had become almost imperceptible and was between 180 and 190, although she had lost practically no blood. We removed the greater part of the growth but left a portion still attached to the rectum and did not dare explore the right broad ligament. A drain was introduced into the pelvis and brought out into the lower angle of the incision. When the cystic mass that was attached to the rectum and had occupied the left broad ligament was cut across, it was found to contain one large irregular cavity about 2.5 cm. in diameter. This contained chocolate-coloured fluid and was lined by a rather smooth-looking membrane which was brownish tinged. The outer coat looked like ordinary muscle.

On microscopic examination it was found that the wall of the blood-stained cyst was lined by one layer of cylindrical epithelium, and that this rested on a definite stroma consisting of cells having oval vesicular nuclei. The more solid portions of the growth were made up of non-striated muscle fibres arranged in whorls, and of quantities of uterine glands embedded in their characteristic stroma. In some places only two or three glands with the surrounding stroma were visible but at other points miniature uterine cavities were found.

We are here dealing with an adenomyoma which has formed a cystic mass in the left broad ligament and which has become densely adherent to the rectum. If the patient at a later date is in fair condition we will then attempt to shell out the thickening in

the right broad ligament, remove the cervix and then a portion of the rectum to which the growth is intimately blended.

Since this note was made the patient had gradually become weaker. She died June 19th. These growths when once removed do not return.

To do the maximum amount of good for the increased numbers that will come for operation as a result of our labours, our surgeons must be thoroughly conversant with the anatomy of the given part and must have a full knowledge of the paths along which the cancer travels from its point of origin. In cancer of the lip the operator must consider the removal of the glands of the neck. In cancer of the breast he must be familiar with the lymph glands that are first involved, and in cancer of the rectum must remember that the liver is frequently secondarily invaded and that if such be the case, an extensive rectal operation is contra-indicated.

I shall never forget meeting one of my Baltimore colleagues abroad one morning and saying, "Why, I thought you were going to Dr. ——'s clinic this morning." The reply was, "I did. He was to do a breast operation at 8.45, I arrived at 9, and the operation was over." This was not long ago, and the surgeon has a world-wide reputation. If our work were to be as superficial and incomplete as in this case, then it were better not to undertake any campaign against cancer. But such is not the case, and admirable work is being done in many clinics, not in all, however, I am sorry to say.

Some surgeons fearing they will not be able to close the wound after an extensive breast operation are loath to remove as much tissue as is necessary. They accordingly make their flaps alarmingly near the cancer area. A recent method devised by my friend, Dr. Curtis F. Burnam, obviates this. The surgeon makes as wide a removal as he deems necessary giving no thought to the raw area left. After removal of the breast the raw area is measured and a skin area of sufficient size is removed from the abdominal wall. It does seem remarkable that this method has not been employed before as a routine procedure, as the abdominal wall is so lax that a flap of practically any size can be removed and the resultant space easily approximated.

Every wide-awake business man has his hands on the reins continually, has careful records of his purchases and of his sales, and at regular intervals takes stock. Recently I was dining with the general manager of one of the greatest trunk railroads in the

United States. He was a keen-eyed business man. After dinner the conversation drifted to methods of keeping track of various data. On my asking him a question he took me back to the dining room in his private car and opened the buffet which in former years was usually stocked with viands, and showed me his card catalogue dealing with all phases of the road. In other compartments he had complete data of every piece of work being done on the entire road, also up-to-date statistics relating to the number and character of the employees of the road. This was a working office of the entire road where he could transact business no matter whether his car was lying on a siding or in a city distant to the home office, where a duplicate set of papers and files were kept. This railroad manager, no matter where he happened to be, was always ready at a moment's notice to satisfactorily transact his company's business.

Hospital management in years past was notoriously lax, but in recent times business methods have been introduced into many of the newer institutions. It would do all medical men good to visit up-to-date business houses and see the card index systems and the various short-cut methods employed in every day business. It would also be admirable for the trustees of the various hospitals to see to it that the same systematic and business-like methods are used in the registration of data in the hospitals with which they are connected, as they employ in their individual business. I cannot help thinking of the Episcopal clergyman in New York, who had as his board of trustees several wide-awake business men. On one occasion it took them several hours to discuss the expenditure of a few hundred dollars. Finally the clergyman in despair leaned over and whispered to one of the trustees, "How would you handle such a proposition in your business?" This trustee replied that such small matters never came to his attention. The ludicrous side of the situation suddenly dawned upon him. Here he and his brother trustees, all millionaires, were spending hours worrying over trivial matters—that would in their business offices be attended to by junior clerks. The trustee immediately moved that the rector be given authority once and for all to order what was necessary for the church, and to send in the bills to them. The trustees of the hospital and the various members of the medical staff are in some measure in a similar position to that board of trustees. Their time is too valuable to be continually taken up in routine, but it is their duty to see to it that competent clerks are employed to keep careful records of all patients entering the



hospital or dispensary. The findings at operation must be recorded with precision and the microscopical examinations of the specimens added to the history.

This is an age of time-saving devices and all business men are keen to see what results have accrued from their endeavours. What applies to business applies equally well to the subject of cancer. What is the use of operating year after year in a routine manner, having but a hazy idea of what has finally become of the patient. At least one tactful clerk in every hospital should be assigned to the task of keeping in constant contact with those who have been operated on. In this manner one can at a glance tell how many patients have been relieved by operation. The results of one operator are compared with those of another—of course in a most friendly way, and there is no doubt that a runner can always make better progress with a pacemaker. The careful analysis of a large number of cases always demonstrates wherein future improvements can be made. This continually keeping track of the patients will in itself strongly impress the former patients with the hospital's interest in their welfare, and will stimulate them to urge their fellow companions to undergo the same treatment if they be taken ill.

These data to be of use must from time to time be thoroughly analyzed and published. You and I are continually gleaning knowledge from the publications of other men both on this and the other side of the water, but how many of us are doing our share in the dissemination of knowledge? In fact we manifest a remarkable tendency to become sponges instead of springs for the pouring forth of our medical experiences—experiences that other surgeons should know of and profit by. Follow up all your cancer patients, see what has become of them. Many of them will be dead, but some that you have lost track of are still living and well. You will soon become so interested in the return letters that you can hardly wait for the postman to arrive, and when now and then a reply says that the patient is alive and well at the end of ten or thirteen years it will warm the cockles of your heart, it will more than outweigh many of the disappointing results you have had and will make you feel that after all the fight is well worth the undertaking.

A year ago I was asked to write the surgeons of the Southern States to find out what their final results were after operation in cancer of the cervix. The results of my inquiries are given in *Surgery, Gynecology and Obstetrics* for March, 1913. The vast majority had kept but scant histories, and had finally lost track

of their patients, so that at the present moment few surgeons in the country have any adequate idea of what their labours have accomplished. Do let me urge upon you the systematic recording of every cancer case, the employment of the most thorough operation in these cases, and the tabulation at yearly intervals of the results. You will thus continually improve your methods, will grow more enthusiastic in your campaign against this dread malady, and will at the same time give valuable data to your colleagues in the profession.

The aim of our cancer campaign committee was to stimulate a wide-spread interest in the subject among the laity. Its labours have already borne fruit. Within the last few weeks a most representative body of New York laity, both men and women, have joined forces with the medical profession in the formation of the American Society for the Control of Cancer. This committee is assured of excellent financial backing, and is bound to be a great factor for the dissemination of knowledge concerning cancer.

We must not overlook the pioneers in publicity. Dr. J. H. Carsten, of Detroit, Michigan, has for years been doing yeoman work in his state, Dr. John G. Clark, Dr. F. F. Simpson and Dr. J. M. Wainwright, in Pennsylvania, Dr. S. Leigh in Virginia, Dr. F. H. Jackson in Maine, and there are a host of others whose names I would like to mention. I would also mention the splendid work of the Council of the American Medical Association in publishing instructions under the chairmanship of Dr. H. B. Favill.

I would strongly urge upon the Canadian Medical Association, the most representative body of Canadian physicians, the advisability of at once appointing a cancer campaign committee for Canada. This could work independently or in close co-operation with one of the cancer campaign committees of the United States.

Much money has been given by philanthropic people for the study of the cause of cancer. Whether the aetiology of cancer will soon be discovered or not is problematical, but in any event the people of the country should be made thoroughly cognizant of the early symptoms of cancer and of the fact that many may be cured by early operation. I can imagine no gift that would yield the philanthropist a greater return than the satisfaction of knowing that as a result of his munificence thousands of lives of cancer patients had been saved by prompt operation.

You in the Dominion have the wealth, the broad-spirited men, and the thoroughly competent surgeons, see to it that in the near future the cancer results of Canada are equal to if not better than those of any other country.

THE RADICAL OPERATION FOR CANCER OF THE UTERUS

By THOMAS S. CULLEN, M. B., Baltimore

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*March, 1913, pages 265 - 272*

## THE RADICAL OPERATION FOR CANCER OF THE UTERUS<sup>1</sup>

BY THOMAS S. CULLEN, M. D., BALTIMORE

THE early recognition in recent years of cancer of the body of the uterus, and, as a consequence, the complete removal of the uterus, has led to such excellent temporary as well as permanent results that a consideration of this variety of cancer of the uterus is at this time entirely unnecessary. Some operators claim that nearly all of these patients are permanently cured of their cancer, and a most conservative estimate would be that fully two thirds of all cases of cancer of the body of the uterus operated upon never show any further manifestation of the disease. This fact is often lost sight of in the gloomy reports frequently published on the final results in cancer of the uterus. The diagnosis in the majority of the cases of cancer of the body of the uterus has been made from scrapings, and from them the diagnosis is rendered certain in the incipient stage of the disease. In no other branch of surgery has the value of the microscope as an aid to the surgeon been more signally demonstrated. In the present address, therefore, I shall limit myself to a consideration of cancer affecting the cervix.

### CANCER OF THE CERVIX

Before considering the immediate and end results in the radical operation for cancer of the cervix, permit me to outline the salient points in our operative treatment of these cases.

*Operability.* It is very difficult to ascertain the percentage of cases that are suitable for operation. Many patients never see a physician until the disease is too far advanced for any radical operation, and often it happens that the surgeon is not even called upon to see the patient. Again, as pointed out very clearly by Taylor, numerous far advanced cases of cancer of the cervix are seen in the dispensaries, and only a minority of these reach the operating room.

When the cervix is freely movable, we con-

sider the case operable; and although the growth may have extended to the vaginal wall, and even if the broad ligament on one side shows diminished mobility, provided the patient is in a fair physical condition, the abdominal operation is considered justifiable.

Before declining to operate, it is, as a rule, advisable to examine the patient under an anæsthetic, as one is occasionally able to detect that the lateral thickening is due, not to an extension of the cancer, but to a coincident inflammation of the tube and ovary. This we have noted on several occasions, and Taylor has recently drawn attention to this point.

### TECHNIQUE OF THE OPERATION

I have never performed a vaginal hysterectomy for cancer of the cervix, but would not hesitate to do so were I dealing with a very stout patient suffering from a carcinoma of the cervix, associated with marked prolapsus.

*Preparatory treatment of the cervix.* In some of the cases, we have cauterized the cervix thoroughly and then abstained from all local treatment for a week, thus giving the raw area a chance to contract down. In some instances, this procedure has been followed by a marked "loosening up" of the cervix, and the uterus, which, prior to the cauterization had apparently been somewhat fixed, in the course of a few days had become freely movable. On the other hand, I have noted that some patients take a second anæsthetic within seven or eight days very badly; and so much have I been impressed with this fact that for several years I have, whenever possible, done the cauterization only just prior to opening the abdomen.

My colleagues at the Johns Hopkins Hospital, at the present time, after cauterizing the cervix and washing out the vagina, flush it out with an iodine and alcohol solution (iodine 3.5 per cent). When this is removed, the vagina is filled with alcohol. After this

<sup>1</sup> Read before the Third Clinical Congress of Surgeons of North America, New York City, November 14, 1912.

in turn has been removed, the vagina is thoroughly dried and is then filled with gauze. This method has proved to be most satisfactory.

#### ABDOMINAL HYSTERECTOMY

The operation is patterned after that described by Wertheim. Good exposure of the field of operation is absolutely necessary to secure a thorough removal of the diseased structures. When the patient is very stout, a transverse wedge of skin and fat down to the fascia may be removed, and the abdomen then entered through a longitudinal incision. This procedure greatly reduces the depth from the surface to the floor of the pelvis, and materially cuts down the time consumed in the operation.

In quite a number of the cases, we have employed an electrically heated table throughout the operation, and it has seemed to me that these patients left the table in a much better condition than the average patient after hysterectomy for cancer.

Proper illumination is of great importance in this operation, and we have found the Krönig light of much value in flooding the field of operation with a steady and most satisfactory flow of artificial sunshine. This light is a great adjunct to any operating room.

As many of the patients are weakened by the long standing hæmorrhage and discharge, I try to save the strength as much as possible by not placing the woman in the Trendelenburg posture until the pelvis has been carefully walled off and the operator is ready to expose the ureters.

As a rule, I have found no difficulty in locating and isolating the ureters except in very stout persons. Here the peritoneum appears to be excessively thin, while the underlying fat is correspondingly thick, and the small blood-vessels in the fat tear on the slightest traction. When the patient is thin, I rarely encounter much trouble until the vaginal veins to the outer side of and below the ureter are reached. These are usually readily controlled with the long Wertheim forceps, but now and then give rise to alarming bleeding. Occasionally, prior to cutting across the vagina, I apply the right-angle Wertheim

clamps, but usually, after doubly walling off the uterus from the pelvic wall, and having had an assistant wipe out the vagina until the pledgets come away free from stain, I cut across the vagina, picking up the vaginal margins with Ochsner clamps.

After all oozing from the vaginal margins has been controlled the bladder peritoneum is tacked to the edge of the mucosa of the anterior vaginal wall. Thus, as the bladder distends, it is the peritoneally covered area that ascends, and no raw surface is left to ride over any drain that may be left.

In some of the cases I have removed the pelvic glands, in others I have not disturbed them. Many of my patients were much exhausted by the operation, and I felt that any further time expended in manipulation in the abdomen would seriously jeopardize the patient's life. In 1900, in my book on cancer of the uterus, I drew attention to the fact that an enlarged gland did not necessarily indicate cancer, inasmuch as the enlargement might be due to septic absorption from the cervix. Peterson, in his series, removed the glands in 29 cases, and in 5 of these found metastases. Of the 5 patients, one died after operation, 3 had a recurrence, and one was well after 3 years. Whether the glands are to be removed or not must depend on the condition of the patient, and must be left to the judgment of the individual operator.

*Closure of the pelvis.* After the bladder has been attached to the anterior vaginal wall and the posterior vaginal wall to the rectum, the broad ligaments are closed. If all oozing has been completely checked, a small cigarette drain is laid in the pelvis and brought out through the vaginal opening, which is now not over 1.5 cm. in diameter. Where there is a little oozing in one or both broad ligaments, I have occasionally placed a cigarette drain in the lower angle of each broad ligament, bringing the ends out into the vagina.

*Duration of the operation.* When the carcinoma of the cervix is in an early stage, the patient is not likely to have lost much blood, and, as little sloughing has occurred, there has been a minimal amount of septic absorption. In such cases the operation is a relatively easy one. In the far advanced cases the

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patient is frequently cachectic as a result of the anemia and the absorption of septic products. In these cases the growth often extends alarmingly close to the ureter, and as a result the dissection is slow. This prolongation of the operation in a patient already greatly weakened by the disease often leads to an alarming collapse before the operation is completed. Such a patient will stand the operation relatively well for from one to one and a half hours, and then suddenly collapse. A Wertheim operation, at best, is one of the most difficult of all the abdominal procedures; consequently the operator needs to be in the best possible physical condition. He should make it his first operation of the day, and preferably perform it early in the morning, when he is fresh. Stimulation of the patient should be undertaken, even before there are the slightest signs of collapse.

When the cervix has been torn across during removal of the uterus, thus materially increasing the danger of peritonitis, I occasionally place an abdominal drain in the lower angle of the incision, in addition to the one emerging from the vagina. In these cases we place the patient in the Fowler position immediately after the operation, if the pulse will permit.

#### RESULTS IN THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE CERVIX

When the Committee of the American Gynecological Society met in Baltimore to arrange the program for its annual meeting, which was held in May of this year it was unanimously agreed that the time had arrived when we should take stock of the results of abdominal hysterectomies for cancer of the cervix in America. The results of some of these labors are to be found in SURGERY, GYNECOLOGY AND OBSTETRICS for August, 1912. That number of the journal includes interesting articles by Peterson, Taylor, and Taussig.<sup>1</sup> At the meeting, Graves reported the results of his work in Boston and Peterson gave his statistics from Ann Arbor, Taylor sent out circular letters to about 175

operators in New York, Brooklyn, and Philadelphia. In his paper he says, "The replies which I received did not give me any information along the line that I wished, and I have not been able to deduce from them anything of value as to the ultimate result of cancer operations in these two states." He learned, however, two things: first, the entire absence of reliable statistics among the operators; second, the universal feeling among the surgeons that the patients were not seen early enough to be permanently relieved.

Taylor then reports his own results. His immediate mortality was only 3 in 28 cases. Unfortunately many of his patients were lost track of, so that he could not determine the relative percentage of permanent recovery.

Taussig communicated with surgeons west of the Mississippi River. In all, he collected records of 60 patients; only 14 of these operations dated beyond the five-year limit. He says, "By a strange coincidence, there was not a single operative mortality among these first 14 patients. Apparently, each operator was particularly careful in the selection of his first cases." Of the 14 patients, one could not be traced and one had died of an intercurrent disease. Of the remaining 12 patients, 5, or 41.6 per cent of these, were still free from recurrence. This is an exceptionally good showing, even though the numbers be small.

Neel,<sup>2</sup> after much labor, was able to trace the records of the cancer cases operated on by the radical method at the Johns Hopkins Hospital. These operations were performed by Dr. Kelly and his associates, and by the residents during the various years. Neel reported, in all, seventy cases in which over five years had elapsed since the radical operation had been performed. There was an immediate mortality of 20, or 28.6 per cent. Of the 50 patients leaving the hospital, nine had been lost track of, and one had died two years later of pneumonia; 14, or 20 per cent of the total number of patients, are to-day free from recurrence, and the remainder had died with unmistakable evidence of return of the growth. Neel draws attention to the fact that, if we deduct the 20 that died immediate-

<sup>1</sup> Dr. John G. Clark of Philadelphia, Dr. J. Sampson of Albany, and several others also briefly reported their results in the radical operation. Dr. Clark's paper appears on p. 255 of this issue, Dr. Sampson's on p. 263.

<sup>2</sup> Dr. Neel's paper appears in this issue, on p. 292.

ly and discard the patient dying of an intercurrent affection, and also subtract the nine cases that were lost track of, he still has 40 patients that survived the operation, and concerning whom he has definite data. Fourteen, or 35 per cent of the 40 patients, are still alive.

At the request of the Committee of the American Gynecological Society, I was asked to find out to what extent the radical abdominal operation was employed for carcinoma of the cervix in the Southern states. Letters were sent out to most of the surgeons in the South, and I take this opportunity of thanking the many who took the time and trouble to reply. The majority had never done a Wertheim operation; a few had performed it two or three times, and had lost sight of the patient. Only in a few instances were the statistics of any value to us, either because the operation was of such recent date or because the patient could not be traced.

Under date of April 6, 1912, Dr. George Tully Vaughan of Washington writes: "In reply to your letter asking for data of Wertheim or other abdominal hysterectomies for cancer of the cervix, I should say that I have not had a large experience in gynecological work. About five complete abdominal operations for cancer are all I can muster—one death and the others still living, so far as I know. One, at least, was heard from recently, three years after the operation."

Dr. H. H. Grant of Louisville, Kentucky, replying under date of April 9, 1912, says: "I have done but seven panhysterectomies for carcinoma, and but two of these included exploration for intra-abdominal glands, none claiming to be Wertheim. There was no immediate mortality. Two of these patients were subjected to amputation of the cervix, because of doubt, and in one, Mrs. L., aged 37 years, reoperation was done after three months for a threatening recurrence in 1900. She died of recurrence ten months after the second operation. The other, aged 41, was reoperated on in three weeks. She died in five months, of recurrence. The other five cases are still living. Mrs. W., aged 54, operated on November, 1909, well; Mrs. B., aged 47, operated on in February, 1910, well;

Mrs. M., aged 51, operated on in April, 1911, well; Mrs. C., aged 42, operated on in March, 1910, suspicious; Mrs. M., aged 48, operated on in December, 1911, well."

Dr. J. Mason Hundley of the University of Maryland has had quite a number of permanent cures, and is a most enthusiastic advocate of the radical operation. Under date of November 1, 1912, he writes: "I find we have records of 21 radical operations for cancer of the cervix done by me since 1905. Of that number, 2 died as a result of the operation and one died after reaching home. Four are living and apparently well; one operated upon about six years ago, three between seven and eight years; and one is now dying, operated upon three years ago. Three are living after two years. The remainder have been lost track of."

At the meeting of the American Gynecological Society, I reported my results in 49 cases in which a complete abdominal hysterectomy was attempted. As noted from the accompanying table, brought up to June 1, 1912, there were 11 immediate deaths, a mortality of 23 per cent; 3 patients were lost track of, and are accordingly included among the dead; 21 died at periods varying from a few months to six years. Fourteen were living and apparently well at the time of the meeting.

Some of the deaths were due to uncontrollable venous oozing, others to shock due to hæmorrhage or to the greatly weakened condition of the patient, others to renal complications, and, in a few instances, to a localized purulent peritonitis. In the tabulation of remote deaths, it will be noted that in some it was clearly evident at the time of operation that the entire growth had not been removed. The death in nearly all of these cases was due to a continued progress of the disease.

*Five-year limit.* Twenty-six of my cases were operated on over five years ago. Of this number, seven died while the patient was still in the hospital. One of the patients was lost track of. Eleven died at periods varying from a few months to six years, and seven, or 26.9 per cent, are well to-day.

1 is well 6½ years after operation.  
1 is well 8 years after operation.  
1 is well 8 years and 4 months after operation.

- 1 is well 8 years and 6 months after operation.  
 1 is well 9 years and 8 months after operation.  
 1 is well 9 years and 10 months after operation.  
 1 is well 13 years after operation.

In three of these cases, the ureters were catheterized prior to opening the abdomen.

The cancer in four of these successful cases was apparently confined to the cervix, the uterus being freely movable. In one case, the growth had extended into the right broad ligament and encroached alarmingly on the ureter.

In one case, the carcinoma had made such extensive inroads on the anterior wall of the cervix that the bladder had become densely adherent to it, and was opened during the dissection.

In the remaining cases, the cervix was so extensively involved that, during the operation, the body was almost completely torn away from the cervix, and on examination of the specimen after removal, the carcinoma was found to have extended almost to the cut surface. In this case a most guarded prognosis was given. It is now over eight years and six months since this uterus was removed. I need hardly add that in every case a histological examination was made.

#### RESULTS OF ABDOMINAL OPERATIONS FOR CANCER OF THE CERVIX<sup>1</sup>

##### *Immediate death, 11 cases —*

- Richardson, April, 1902.  
 Tate, July, 1902 (H).  
 Kyle, October, 1902 (H).  
 Compton, April, 1903.  
 Rogers, March, 1905.  
 Hayward, February, 1906.  
 Vogelsang, November, 1906 (H).  
 Havistick, August, 1909.  
 King, December, 1909 (H).  
 Pfaff, January, 1910.  
 Harris, November, 1910 (H).

##### *Not located, 3 cases —*

- Collins, January, 1905.  
 Welch, January, 1908 (H).  
 Owens, February, 1908 (H).

##### *Patients living, 14 cases —*

- Ryan, June, 1911; 11 months (H).  
 Carroll, May, 1911; 12 months (H).  
 Griffith, October, 1910; 18 months.  
 Lucas, November, 1909; 2 years, 5 months (H).  
 Heilman, December, 1908; 3 years, 5 months (H).  
 Sangwin, May, 1909; 3 years, 6 months.  
 Conklin, June, 1908; 3 years, 8 months (H).  
 Humphreys, December, 1905.  
 Hetzen, April, 1904; 8 years.

<sup>1</sup> Those marked with (H) I performed at the Johns Hopkins Hospital; the others were done at the other hospitals with which I am connected.

Verkes, January, 1904.

Brown, August, 1903; 8 years, 6 months.

Wotten, August, 1902; 9 years, 8 months.

Mrs. M., patient of Dr. Geo. H. Carveth, Toronto,

December, 1902; 9 years, 10 months.

Ketler, June, 1899, 13 years.

##### *Remote death, 21 cases —*

White, April, 1903; partially removed

Tolley, April, 1903; partially removed.

Bowen, November, 1911; 2 months, uremia, blindness.

Olfers, April, 1908; recurrence, 3 months (H).

Jones, 1910; died, 6 months (H).

Bozeman, December, 1910; incomplete removal. Died,

6 months.

Snively, June, 1910; died, 6 months.

Finkle, April, 1903; died, 8 months.

Porter, January, 1905; not entirely removed; died, 11

months.

Karr, July, 1906; died, 14 months (H).

Franklin, February, 1908; died, 16 months (H).

Wills, October, 1905; died, 18 months (H).

Mack, February, 1908; died, 19 months (H).

Raymond, January, 1908; died, 21 months (H).

Ferguson, September, 1906; died, 21 months (H).

Trego, January, 1900; lived 2 years.

Baldwin, May, 1907; lived 2 years.

Ardinger, July, 1908; lived 2 years, 10 months (H).

Stehle, May, 1904; lived 4 years.

Riggins, January, 1905; lived 5 years.

Mengel, May, 1904; lived nearly 6 years.

##### *Operated on over 5 years ago; 26 cases —*

Immediate death, 7 cases.

Not located, 1 case.

Remote deaths at periods varying from a few months

to nearly 6 years, 11 cases.

##### *Living —*

7 cases or 26.9 per cent.

#### PROGNOSIS

Even after removal of the uterus, it is very difficult to give a satisfactory forecast as to the ultimate result. Sometimes a case that seems most favorable shows an early recurrence, while a border-line case that looks most unfavorable may remain free of the disease. When the growth of the cervix is of a glandular type, however, we may look for a speedy return.

An early local return, while most disconcerting, need not necessarily prove fatal. Nearly two years ago, a very competent surgeon in a Southern state did a radical operation, and within a few months a carcinomatous nodule was detected in the vault. In this case, on account of the proximity of the carcinoma to the ureter, I opened the abdomen and isolated the ureters and removed a long cuff of the vagina. This patient, up to the present time, 16 months later, has had no further manifestation of the disease.

*Temporary Relief.* Some surgeons are of



the opinion that, if the entire growth has not been removed, the patients suffer much more than if no radical operation has been performed. In my experience, the patient in the late stages is no more prone to pressure symptoms than is the woman who has not been operated upon. On the other hand, frequently the growth spreads in such a manner that the vaginal mucosa is not again involved, and the patient is accordingly spared the frequent hemorrhages and the foul-smelling discharge. I am frank to admit that in some cases I would have refrained from operating had I been aware of the widespread extension of the disease; but sometimes, when the growth is not very dense, the extent is only ascertainable when the operator has partially completed his dissection, and complete removal of the uterus cannot then be avoided.

#### DEDUCTIONS

It is difficult to lay down a hard and fast rule as to what cases should and what cases should not be operated upon. All familiar with the course of this dread disease know that in time the hemorrhages become very severe, and that later on, in the intervals between hemorrhages, the patient has a most foul and loathsome discharge, and that in some cases rectovaginal or vesicovaginal fistulæ or both may develop. They also know that the patient becomes a burden to herself and a source of the greatest anxiety to her family, who are powerless to do anything; and, finally, that most painful pressure symptoms may develop. With such an outlook, I feel sure that there is not a man in this audience who, if brought face to face with such a problem in his own family, would not gladly take the chance of an operation, if there were only one or two chances in a hundred; as a matter of fact the chances are infinitely better.

Over a decade ago, when speaking before the Academy of Medicine in this city on the early diagnosis of cancer of the uterus, one of the most distinguished gynecologists of New York, in the discussion, said, if I remember correctly, that he had operated on over 120 cases of carcinoma of the uterus, and that at the time of the meeting not one of them was living.

The splendid results obtained by Wertheim and others in Europe leave no doubt that great strides have been made in the cure of cancer of the uterus, and even from the limited observations in America, it is clear that considerable progress has been made, and there is no reason why we should not materially increase our percentage of permanent cures. The Germans certainly have one advantage over the American surgeons. Many of their patients have had large numbers of children and, owing to their manner of work, have not accumulated the large amount of adipose tissue that is so prevalent with us. Consequently the continental operator can at once secure a much better exposure, and is not troubled with the abundance of adipose tissue around the ureter and in the broad ligament.

The oftener the surgeon performs this operation, the more expert he becomes; the length of the operation is shortened, and consequently the death rate is lowered. The German surgeons apparently see many more of these cases than surgeons in this country. During my last trip to Germany, I was making rounds with Professor Zweifel, in Leipzig, and he told me that in one month he had performed fifteen Wertheim operations for cancer of the cervix. It is, therefore, only natural that the German surgeon should have a lower operative mortality. Again, the continental surgeon has materially profited by the widespread publicity which the cancer problem has received, both in the profession and among the laity.

From time to time attempts have been made in America to start an education of the women of this country to the necessity of reporting any suspicious symptoms at once to their physicians, but, apart from some spasmodic efforts, nothing has really been accomplished. It would be most fitting if this splendid society should here and now start a cancer campaign that would extend from coast to coast. It can and should be undertaken at once. Publications that have done much to enlighten the laity on medical matters could be of invaluable service in the dissemination of this knowledge.

The laity now have a clear idea of the sub-

ject of appendicitis, and whereas a decade ago it was often necessary for the family physician, after making the diagnosis, to spend hours in urging the necessity for immediate operation, at the present day, after he has given his verdict, the first question asked by the family is, to what hospital the patient should be sent.

The splendid crusade against tuberculosis is another example of the immense amount that has been accomplished by the education of the rank and file of the community.

Two or three well-illustrated articles, explaining in simple words just what cancer is, how it spreads, and what may be accomplished by early operative interference, will be all that is necessary to put women on their guard. Many of them have an innate fear that they will some time develop cancer of the uterus, and are fully aware of the distressing train of symptoms in the advanced stages of this dread disease. What we want to do is to impress upon them the fact that any abnormal bleeding, no matter how slight, should be immediately investigated by their physician to ascertain if cancer be present. If no malignancy be found, they are relieved of their unnecessary anxiety. If cancer be present, it can be combated in the early stages. The fact that early cancer may be successfully eradicated by operation, and that it is in the beginning a strictly local process instead of a "general blood disease," as it is so often referred to by the laity, should be most forcibly impressed upon the community.

The sooner this subject is launched the sooner will our percentage of permanent cures increase. I feel sure that after women in general are thoroughly familiar with the necessity of an examination just as soon as they present any symptoms, the surgeon will be able to save, at a conservative estimate, from 20 to 25 per cent of these cases.

Among the most important surgical papers that emanate from the larger clinics are those which deal with the after results in various operative procedures, and it is well worth the

while of every surgeon to "take stock" at regular intervals. Having a vivid recollection of the numerous immediate deaths I had encountered following the Wertheim operation, I hesitated long before I could make up my mind to attempt to locate the patients that had left the hospital. But when, finally, the work was commenced, and it was found that some patients had enjoyed comparative comfort for one, two or three, or even six years, I felt that the operation had been worth while. And when seven letters came back saying that the patients were well at periods varying from six to thirteen years, and expressing the most profound thanks for what had been done for them, I could not help feeling that the radical abdominal operation is the one destined to yield the best results.

This is an operation, however, that cannot be lightly undertaken, as it requires the very best efforts of the surgeon. My friend, Reuben Peterson, has expressed my sentiments so well that in conclusion I will quote what he has recently said on the subject.

"My belief in this operation has only become stronger. However, the experience afforded by eleven additional cases has not made me any more confident that the next patient I operate upon will either survive the primary operation or will ultimately be cured. On the contrary, in contrast with other abdominal operations, the more I perform this operation the more I respect and, possibly, dread it. Yet I adhere to it for the simple reason that, in my hands, all other operations for cancer of the uterus have been disappointing in their uniformly bad ultimate result, while with the radical abdominal technique I have been able to save a fairly good percentage of my patients, and that, after all is said, is what the surgeon is after. If he be not content to set at naught his surgical reputation as far as primary results are concerned for the sake of ultimately curing more patients, he would best not meddle with this operation, which, in apparently favorable cases, is only too apt to turn out to be grave."

OPERATIONS ON PATIENTS WITH A HEMOGLOBIN OF FORTY  
PER CENT OR LESS

By THOMAS S. CULLEN, M. B., Baltimore

From the Gynecological Department of the Johns Hopkins Hospital and the Johns Hopkins University

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## OPERATIONS ON PATIENTS WITH A HEMOGLOBIN OF FORTY PER CENT OR LESS<sup>1</sup>

By THOMAS S. CULLEN, M. B., BALTIMORE

From the Gynecological Department of the Johns Hopkins Hospital and the Johns Hopkins University.

SEVERAL months ago our worthy secretary, Dr. LeRoy Broun, asked me if I would not look up for this meeting our operative results in cases with a low hæmoglobin. We have examined the cases of the gynecological department of the Johns Hopkins Hospital from 1880 to 1912 and have found records of about 170 cases in which the hæmoglobin was 40 per cent. or below. This, however, by no means represents the total number. In the early days the hæmoglobin estimate was not made as a routine procedure, and from time to time since an occasional omission has occurred. The figures are, however, fairly accurate. I have decided on 40 per cent. as a convenient arbitrary percentage. We are all familiar with the fact that many patients with less than 40 per cent. of hæmoglobin pass through an operation very satisfactorily, but in any case in which the percentage is 40 or less the operator naturally has a certain amount of anxiety. In our group are included a few cases which for various reasons were not operated upon.

Dr. Benjamin O. McCleary has been of the greatest assistance to me in obtaining the necessary data and I gladly acknowledge my indebtedness to him.

For the purpose of convenience I shall divide the cases into two main groups:

1. Patients that recovered.
2. Patients that died.

### CAUSES OF THE LOW HÆMOGLOBIN IN THE PATIENTS THAT RECOVERED

*Uterine myomata* were associated with a low hæmoglobin in 42 cases. As is well known, the position of the myoma is responsible for the bleeding. A myoma may reach very large proportions without occasioning any loss of blood provided it does not in any way encroach on the uterine cavity. On the other hand a submucous myoma not over 1 or 2

cm. in diameter may cause alarming hæmorrhage. Accordingly it is the submucous myomata that are responsible for the very low hæmoglobin.

### UTERINE MYOMA

Gyn. No.	Percent.	Gyn. No.	Percent.	Gyn. No.	Percent.
6062	34	6618	24	10918	40
7313	35	6678	23	11077	22
7438	30	6707	26	11139	25
7913	30	6738	35	11243	24
7944	40	6766	30	11366	34
8130	28	10772	20	11580	49
8034	33	10787	33	11734	25
8430	35	10861	35	11757	40
0070	33	10370	30	11869	25
8031	35	10453	40	14747	30
9953	35	10262	35	14158	20
9071	22	10573	35	14004	40
9303	40	10907	23	15495	35
9730	23	10605	30	18183	25

<sup>1</sup>No operation. <sup>2</sup>Tubovaricellous. <sup>3</sup>Infected. <sup>4</sup>Bleeding.

*Hyperplasia of the endometrium* was the cause of the low hæmoglobin in 23 cases. This condition is a definite pathological entity that as yet has not been accorded the recognition it deserves. The endometrium presents a most characteristic picture. The mucosa is thicker than usual. The surface may be perfectly smooth or there may be little polypoid outgrowths projecting from the surface. Many of the uterine glands are small and circular on cross section; others are larger and still circular; not a few are at least ten times as large as normal and are somewhat irregular. The glands, whether large or small, have a much higher epithelium than normal and many of them are apparently lined with two or three layers of epithelium. The stroma is much more cellular than usual and its cells frequently contain nuclear figures. The veins in the stroma are often much dilated forming sinuses, which at times are partly or completely filled with organizing thrombi.

Given such a condition one can supply a relatively accurate clinical picture of the patient. She is usually between 35 and 45

<sup>1</sup>Read before the American Gynecological Society, Washington, D. C., May 8, 1913.

years of age and her periods are excessive. As a rule, there is no intermenstrual discharge of any kind. Curettage is usually followed by perfectly normal menstrual periods for from three or four months to a year. The excessive bleeding then recurs, to be again relieved by curetting. The hemorrhages may be permanently relieved after several curettings, but in not a few cases it is in the end necessary to remove the uterus. I drew attention in 1900 to this group of cases in "Cancer of the Uterus" (p. 479) and in "Adenomyoma of the Uterus" (p. 181, Fig. 53). Since then I have seen this condition several times in young girls. Quite recently I saw a girl, 16 years of age, suffering from a profuse and continuous bleeding. A physician who saw the large amount of mucosa removed felt sure that I was curetting away remnants of an afterbirth and only on microscopic examination of the scrapings was he convinced that no pregnancy had existed. Dr. Elizabeth Hurdon has also seen a case of hyperplasia of the endometrium in a girl still in her teens. This is a condition with which we should all be thoroughly familiar. In some of the 23 cases here mentioned the hyperplasia was of a mild grade, in others it was marked.

## HYPERPLASIA OF THE ENDOMETRIUM

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
5783	31	10136	35	13883	20
5976	17	10165	35	14059	40
6128	53	10490	38	14393	38
6680	25	10501	35	13883	35
7846	40	10902	14	14698	15
8413	25	11040	25	16341	40
9002	40	11750	35	17244	40
9349	20	12070	40	18030	35
10097	20	13344	30		

*Squamous-cell carcinoma of the cervix* was the cause of the low hæmoglobin in 18 of the cases.

## SQUAMOUS-CELL CARCINOMA OF THE CERVIX

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
7454	35	9266	38	16104	39
7564	22	10840	18	16846	30
7780	30	11108	33	16880	30
7810	35	13376	40	17600	32
7840	38	13545	40	18153	12
7900	30	13943	19	18333	35
9004	33	13989	40		

*Pelvic inflammation* was apparently the cause of the low hæmoglobin in 13 of the cases. We are all familiar with the frequency

with which a pelvic inflammation, especially if one-sided, may simulate a tubal pregnancy and there are probably few of us who have not opened the abdomen confidently expecting to find a tubal pregnancy only to encounter a pus tube or general pelvic adhesions.

## PELVIC INFLAMMATION

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
6615	39	11764	28	16294	38
8146	40	11934	30	16333	20
9130	38	13826	29	16494	40
9560	32	15745	21		
11052	23	16290	35		

*Retained placental tissue* had brought about a hæmoglobin of 40 per cent. or less in 13 cases. In one of these the loss of blood had been so great that the patient's hæmoglobin was only 15 per cent. on her admission to the hospital.

## RETAINED PLACENTAL TISSUE

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
5759	38	9200	37	11803	40
6164	38	9558	35	14801	17
7794	35	9878	30	18973	30
7968	23	10001	35	Endometrium of pregnancy.	
8042	30	10148	19		

*Tubal pregnancy.* Where the tube is still intact the abdomen may contain no blood, but if the tube ruptures or if there be a tubal abortion, the abdomen may be filled with blood, the amount being only limited by the capacity of the patient's abdomen. Consequently the multipara will naturally lose more than the nullipara whose abdominal walls have never been distended by a pregnancy. In 12 of our successful cases the low hæmoglobin was due to a ruptured tubal pregnancy.

## TUBAL PREGNANCY WITH A LOW HÆMOGLOBIN

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
6050	40	11815	28	16296	25
7782	30	11830	35	16615	40
9594	37	13211	35	17438	23
10170	40	15226	35		
10829	39	15245	35		

*Adenomyoma of the uterus* was the cause of the low hæmoglobin in 7 cases. In this group of cases we have a diffuse myomatous thickening of the uterine wall. This may be limited to the anterior or posterior walls, or form a mantle around the uterine cavity. The uterine mucosa passes down into the crevices in the myomatous tissue and in addi-

tion the uterine walls often contain discrete myomatous nodules. The excessive loss of blood at the periods, the severe pain at the period so often noted, coupled with the fact that there is no intermenstrual discharge, and that the endometrium is normal, taken together give a symptom complex which renders the clinical diagnosis relatively certain.

## ADENOMYOMA WITH LOW HEMOGLOBIN

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
6631	24	13407	40	16603	40
7559	30	14950	35		
11019	40	16010	40		

*Chorio-epithelioma.* One of our patients (10094) on admission had a hæmoglobin of 10 per cent. Another (18034) came to the hospital with a hæmoglobin of 40 per cent.

*Other causes of a low hæmoglobin.* In looking through this list it will be noted that in addition to carcinoma of the body of the uterus, hæmorrhoids and prolapsed rectum, where the loss of blood could account for the low hæmoglobin, there were other causes such as peritoneal carcinoma, amenorrhœa, chronic interstitial nephritis, mitral insufficiency, ovarian and pelvic abscess. In these the low hæmoglobin was due to some factor other than the loss of blood.

	Gyn. No.	Per cent.
Abdominal carcinoma	8219	25
Hæmorrhoids	8360	35
Adenocarcinoma of ovary with metastases	8907	40
General peritoneal carcinoma	9,12	35
Adenocarcinoma of uterus, left tube and ovary	9,70	38
Pregnancy	9940	40
Carcinoma of body of uterus	10838	40
Prolapsed rectum	11325	36
Menorrhagia (no op.)	11347	28
Large ovarian cyst—refused operation	11555	40
Chronic ulcer of cervix	11278	
	11502	40
Carcinoma of body of uterus	11762	35
Abscess occupying right side of abdomen after labor	12456	26
Abscess in left broad ligament	13564	37
Ovarian cyst, abscess in right broad ligament (fell to 32%)	13601	50
Amenorrhœa, infantile pelvic organs, T. B.	14544	30
Tuberculosis of endometrium and appendicitis	15542	21
Hypertrophy of cervix	15838	30
Indefinite menorrhagia	16264	35
Adenocarcinoma of cervix	17080	28
Amenorrhœa, retroposition, pulmonary tuberculosis	14544	
	17322	30
Pelvic melanosarcoma and ascites	17377	40

## PERCENTAGE OF HEMOGLOBIN

In our series of patients that lived, 14 had a hæmoglobin below 20 per cent. The lowest were 10 per cent. (9593), 12 per cent. (18153), 14 per cent. (10902), 14 per cent. (11889), 15 per cent. (10001), 15 per cent. (13883 and 14698), 15 per cent. (16405).

In summing up the hæmoglobin in 152 cases we find approximately the following:—

	No. Cases
Between 40 and 36 per cent., inclusive	49
Between 35 and 31 per cent., inclusive	30
Between 30 and 26 per cent., inclusive	29
Between 25 and 20 per cent., inclusive	30
Below 20 per cent.	14
	152

## OPERATIONS ON PATIENTS WITH A HEMOGLOBIN BELOW 30 PER CENT.

*Curetage.* An other examination with curettage even with a very low hæmoglobin gives rise to little or no trouble, as is indicated by the following list.

## CURETTAGE

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
5976	17	13883	15		
10097	20	14698			
10902	14	15745	21	7908	23
11049	25			7908	23
11652	23			10001	15
13883	20	10094	20	10148	19

*Vaginal removal of a submucous myoma.* In seven cases this was successfully accomplished. Where, however, only a portion of the myoma is submucous, the greater part of the tumor being interstitial, and the hæmoglobin index very low, the vaginal operation is out of the question and any operative interference is fraught with great danger, particularly when the myoma is sloughing.

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
6002	24	9678	23	16405	15
9620	23	11743	23		
9638	21	11889 (partial)	14		

*Abdominal operations in the presence of a low hæmoglobin.* These consisted in an exploratory laparotomy, conservative operations, removal of the appendages on one or both sides, removal of tubal pregnancies and the drainage of an abdominal abscess in a desperately ill patient. Even with the low hæmoglobin the patients stood the operations well.

	Gyn. No.	Per cent.
Exploratory laparotomy	8219	25
Conservative abdominal operation	16333	20
Removal of tubes and ovaries	6680	25
Removal of tubes	11764	28
Removal of right appendages	17438	23
Removal of tubal pregnancy	11815	28
Opening abdominal abscess following labor (desperate condition)	16296	25
	12456	26

*Hysterectomy on patients with a low hæmoglobin.* As seen from the accompanying table, vaginal hysterectomy was performed in two cases and abdominal hysterectomy in 17 cases with success, despite the fact that in one case the hæmoglobin was only 10 per cent. and that in several others it was below 25 per cent. The results clearly show that even with a very low hæmoglobin, hysterectomy may be safely undertaken. In such cases, however, the utmost care must be taken to avoid any unnecessary loss of blood and I have also found that in such cases the shorter the time the patient is on the operating table the better.

#### HYSTERECTOMIES PERFORMED ON PATIENTS WITH HÆMOGLOBIN BELOW 30 PER CENT.

##### (a) Vaginal hysterectomy:

Gyn. No.	Per cent.
6631	24
7504 Carcinoma of cervix	22

##### (b) Abdominal hysterectomy:

Gyn. No.	Per cent.	Gyn. No.	Per cent.	Gyn. No.	Per cent.
7438	19	8413	25	11139	25
8130	28	Curettagc	25	12234	25
9291	22	Hysterect.	38	12800	25
9340	29	0786	20	14458	20
9593, 10623 (Op.)	10172	29	13542	21	
9797	26	11077	22	17080	28
				18185	25

#### PATIENTS WITH A LOW HÆMOGLOBIN, UNABLE TO UNDERGO AN OPERATION AND WHO DIED IN THE HOSPITAL.

I shall here briefly record the history of each of these cases. Cases 8804, 11337 and 14477 indicate very clearly that myomata, if left alone, occasionally are the direct cause of death. Elsewhere<sup>1</sup> I have shown that in over 1 per cent. of our myoma cases sarcoma developed in or was associated with the myomata and that in over 1 per cent. of the myoma cases carcinoma of the cervix was found; and further that in 1.7 per cent. of the myoma

<sup>1</sup> Myomata of the Uterus. Kelly and Cullen, pp. 160, 262, 274.

cases adenocarcinoma of the body was also present with the myomata. Here we have three cases in which the death was directly due to the hæmorrhage from submucous myomata, the hæmoglobin being 20 per cent., 12 per cent. and 10 per cent. respectively.

In cases 10975 and 18533 the low hæmoglobin coupled with the infection was amply sufficient to cause death. In the two remaining cases the carcinoma with its secondary complications naturally caused a fatal outcome.

*A large, sloughing submucous myoma; irrigation and packing of the uterine cavity. Hæmoglobin 20 per cent.; death.* Gyn. No. 8804. M. P., white, aged 45. Admitted to the Johns Hopkins Hospital May 30, 1901; died June 1, 1901. For nearly four years the patient had had frequent uterine hæmorrhages and for three weeks prior to admission had passed clots. She had grown progressively weaker and for the last two weeks had had fever. On admission she looked desperately ill; the hæmoglobin was 20 per cent. The abdomen was markedly distended by the myomatous uterus. The uterine discharge was offensive. The cavity was irrigated and a litre of foul clots came away. Death soon followed.

*Submucous myoma, hæmoglobin 12 per cent. No operation; death.* Gyn. No. 11337. B. H., aged 38, colored, nullipara. Admitted to the Johns Hopkins Hospital June 6, 1904; died June 10, 1904. Her complaint on admission was weakness and uterine hæmorrhage. She had been married ten years. She began bleeding on December 16, 1903 (7 months before admission); each flow was profuse and lasted two weeks up to March, 1904. She had lost so much in strength that she was forced to remain in bed. After March the hæmorrhages had become constant, very severe at times, large clots had been passed and there had been in addition a very foul leucorrhœal discharge. The bowels had been constipated and she had suffered a great deal from nausea and vomiting. On admission she was fleshy but very anæmic. The abdomen was tender just above the symphysis on both sides and a mass could be made out extending above the symphysis. The cervix was smooth and normal, the os patulous. Occupying the position of the fundus was a mass the size of a cocoa-nut. The patient bled profusely from the prick in her ear made to obtain the blood for the estimation of the hæmoglobin, although the needle was of small size. Adrenalin had little effect. The bleeding was checked by the use of compresses and colloidion. The blood obtained showed a hæmoglobin of 12 per cent., red blood corpuscles 1,828,000, white blood corpuscles 8000. On June 8th the patient was markedly nauseated and vomited. The vagina was packed tight with gauze. The patient continued to grow worse, became irrational and restless, and died on June 10, 1904.

*Pueri labor, death.* Pueri, white, January, died on breath; hæmoglobin 2 years. Three w For the began t. bleeding 4 days li and leve chills co incontin in the ab pale and charge, voluted.

At autopsy, in addition to the myomatous uterus there was double hydrosalpinx and an ovarian cyst, extreme secondary anaemia, fatty degeneration of the heart and other organs, focal necroses in the liver and a healed infarct of the spleen.

*Submucous uterine myomata, haemoglobin 10 to 15 per cent, pulse 160 to 180. No operation. Death from weakness and shock.*  
Gyn. No. 14477. S. F. B., aged 36, colored. Admitted to the Johns Hopkins Hospital January 6, 1908, died January 7, 1908. This patient was seen at her home on January 6, 1908. She was extremely anemic. Her haemoglobin varied from 10 to 15 per cent., her pulse from 160 to 180. She had all the symptoms of internal hemorrhage, was extremely restless, had marked pallor and was dyspnoic. For some years she had had a very profuse menstrual flow at intervals of from two to three weeks, lasting several days. She would pass a large quantity of clotted blood with a great deal of pain. Her physician at that time advised removal of an abdominal tumor. There had been a partial prolapse of the uterus. She has been confined to bed for some time. When seen at her home she had not voided for 36 hours and her general condition was precarious. The submucous vaginal growth was apparently attached by a pedicle 4 to 5 cm. in diameter. On abdominal examination the bladder was found to be markedly distended and reached almost to the costal margin on the left. This accounted for her inability to void. On the right side could be felt a hard indurated nodular mass, apparently a myomatous uterus movable from side to side, but firmly fixed in the pelvis. On admission to the hospital the condition was so critical that operation was deemed out of the question. The rectal temperature was 94° F. She died at 3 P. M. of the same day. At autopsy a myomatous tumor of the uterus was found. The cervix was dilated to 6 or 8 cm. in diameter. Death was due to extreme weakness and shock.

*Puerperal infection developing three weeks after labor. Haemoglobin 25 per cent. No operation; death.* Gyn. No. 10975. B. G., married, aged 20, white. Admitted to the Johns Hopkins Hospital January 6, 1904, died January 8, 1904. This patient entered the hospital with fever, shortness of breath and at the time of her admission she had a haemoglobin of 25 per cent. She had been married 2 years, had had one child and one miscarriage. Three weeks before she had had a full-term child. For the first day after, she had felt well, but then began to suffer with pain in the abdomen. The bleeding kept up continually. She was curetted 4 days later by her physician, but had a severe chill and fever on the day following. The fever and the chills continued and there was vomiting every day, incontinence of feces, a vaginal discharge and pain in the abdomen. On admission she was exceedingly pale and there was a purulent reddish vaginal discharge. The cervix was soft, the uterus subinvolved, in ante-position. There was some thick-

ening in the broad ligament and marked tenderness everywhere in the pelvis. Her red blood count was 2,100,000, leucocytes 7200, haemoglobin 25 per cent. She gradually grew worse and died January 8, at 9:15 P. M.

*Thrombosis of the ovarian veins, vegetative endocarditis of tricuspid valve, pericardial effusion, bilateral fibrinous pleurisy, lobar pneumonia. No operation; haemoglobin 25 per cent; death.* Gyn. No. 18533. H. P., colored, aged 40. Admitted to the Johns Hopkins Hospital July 18, 1912, died August 1, 1912. On admission she was irrational and her history had to be obtained from a relative. She had been feeling badly for a month but had worked up to a week of her admission to the hospital. She complained of pain in the lower abdomen and had fever. She had been married 20 years and had had 8 children and one miscarriage. She had always been well up to the present illness, about ten or twelve days before admission. When she entered the hospital she was very drowsy, irritable when aroused, did not answer questions clearly, could not tell her age, but was conscious of the fact that she was in a hospital. She apparently understood questions, but only when they were asked a number of times. The skin was hot and her tongue coated. The breathing was harsh and there were sibilant râles. The heart was slightly enlarged; the pulse rapid. The abdomen was somewhat distended. Its walls were thin. There was considerable voluntary resistance.

On vaginal examination the mucous membranes were found to be pale. There was bulging of the anterior and posterior walls. The os readily admitted the tip of the index finger. The cervix was larger than normal. The fundus could not be made out on account of resistance. The haemoglobin was 25 per cent.; the leucocytes were 17,400. On the following day the leucocytes were 21,500, red blood corpuscles 3,300,000. On July 20 the patient was gradually becoming worse. Blood cultures showed *Staphylococcus aureus*.

On July 23d a mass of doughy consistency and tender was found in the right side just in front of the iliac bone.

On July 25th the condition was about the same. The kidneys were acting normally. Red blood cells 1,736,000, whites 20,500, haemoglobin 25 per cent.

July 30th. The patient refused all food. Nutrient enemata were expelled. The respirations rose to 60 per minute. There was a slight cough with blood-tinged sputum.

July 31st. Consolidation was noted in the lower left lobe. Death occurred at 12:15 P. M.

In this case a Wassermann test was negative. Blood cultures showed *staphylococcus aureus*. Autopsy revealed thrombosis of the ovarian veins. There was vegetative endocarditis of the tricuspid valves, pericardial effusion, bilateral fibrinous pleurisy, lobar pneumonia, chronic congestion of the liver.

*Bilateral ovarian adenocystomata, multiple uterine myomata, carcinoma of the sigmoid, perforation of the*



lower bowel, gangrenous peritonitis, hemoglobin 40 per cent. No operation; death. Gyn. No. 12656. E. C., aged 30, colored. Admitted to the Johns Hopkins Hospital January 25, 1906, died February 8, 1906. This patient had never been pregnant. She was suffering from diarrhea, having four or five stools a day. She had been passing blood in the stools for a long time, probably a year, but had not suffered from hemorrhoids. In June, 1905, she had continuous severe abdominal pain, especially in the lower portion; this had gradually become worse. It had borne no relation to menstruation. She had noticed an abdominal swelling about 5 months before admission. The swelling had rapidly increased and night sweats appeared. There had been no leucorrhoeal discharge, but loss of weight and strength. She had become very weak and emaciated. On admission the temperature was 102° F., the pulse 120; the red blood corpuscles were 2,720,000, whites 34,400, hemoglobin 40 per cent.

Her condition gradually grew worse and she died February 8th. At autopsy bilateral ovarian adenocarcinoma, multiple myomata of the uterus, carcinoma of the sigmoid, perforation of the bowel and a gangrenous peritonitis were found.

*Squamous-cell carcinoma of the cervix with extension to the pelvic structures. Metastases to the liver and rectum, double hydro- and pyonephrosis. Hemoglobin 25 per cent, no operation, death.* Gyn. No. 8058. H. B., colored, aged 38. Admitted to the Johns Hopkins Hospital July 31, 1901. The patient gives a history of sudden profuse uterine hemorrhage in September of the preceding year. She was sewing at the machine at the time, became so weak that she fainted and large clots came away. She has been passing large clots from time to time since then and has undergone some operation at another hospital within the last few months. At the present time she complains of pain in the hip, which radiates up and down the leg, of colicky pains in the abdomen every few minutes and of cramplike pains in the umbilical region. She has a great deal of nausea; even a sip of water will make her vomit. At times she is very hungry, but afraid to eat. She suffers from constipation, increased frequency of micturition and at times difficulty in passing water.

When the patient was admitted she was very weak and considerably emaciated. The inguinal glands were palpable on both sides. There was a foul smelling vaginal discharge, watery in character, and almost the entire vagina was filled with a nodular mass which was fungating; it involved the anterior vaginal wall and extended far out on the lateral walls.

Clinical diagnosis. Squamous-cell carcinoma of the cervix with pelvic involvement. At this time the hemoglobin was 28 per cent. The patient was in no condition to stand operation. She died on September 3, 1901.

Autopsy. Anatomical diagnosis: Carcinoma of the cervix with metastases in the broad ligament, pelvic, inguinal and abdominal lymph glands, in the

labia, the rectum and liver; double hydro-ureter and hydronephrosis. Effusion in the pleural cavities; cystic ovary.

#### DEATHS FOLLOWING OPERATION ON PATIENTS WITH A LOW HÆMOGLOBIN

We have had 13 patients with a low hæmoglobin that succumbed after operation.

Case		Per cent.	
8024	Abd. hysterectomy for myoma; hæmoglobin.....	40	Death
10678	Removal of tubal pregnancy; hæmoglobin.....	15	Death
15314	Removal of tubal pregnancy; hæmoglobin.....	32	Death
10303	Abd. removal of tubo-ovarian abscess	38	Death
9362	Abd. hysterectomy for squamous-cell carcinoma of cervix.....	39	Death
9387	Vag. hyst. for squamous-cell carcinoma of cervix.....	35	Death
16132	Explor. abd. op. in advanced squamous-cell carcinoma of cervix.....	15	Death
18341	Abd. hyst. for squamous-cell carcinoma of cervix.....	33	Death
0911	Abd. hyst. for carcinoma of body of uterus	35	Death
7610	Expl. of abd. inoperable carcinoma of ovary.....	27	Death
10009	Expl. of abd. inoperable carcinoma of ovary.....	35	Death
10306	Abd. removal of pelvic structures for carcinoma of ovary.....	38	Death
16008	Abd. hyst. for chorio-epithelioma.....	35	Death

<sup>1</sup>On 28th day. <sup>2</sup>After several months.

*Myoma.* In Case 8024 in which an abdominal hysteromyomectomy was performed the convalescence, as seen from the history, was normal until the 16th day when intestinal complications developed. We have had numerous abdominal hysterectomies on patients with a hæmoglobin lower than 40 per cent. and had this patient not developed the intestinal complications she would certainly have recovered.

*A myomatous uterus, hæmoglobin 40 per cent. Hysteromyomectomy, death.* Gyn. No. 8024. Path. No. 4255. S. F., aged 45, colored. Admitted to the Johns Hopkins Hospital July 28, 1900, died August 28, 1900. This patient had been married 22 years, had had one child, no miscarriages. For eight weeks she had gradually been losing weight and strength. When she was first taken ill she had had vomiting and could keep nothing on her stomach. She had noted something growing in the lower abdomen for about two years. There had been slight straining at micturition. On admission the patient was poorly nourished. The lower portion of the abdomen was distended by a rounded tumor mass about the size of a six months' pregnancy. At the time of operation the hæmoglobin was 40 per cent.,

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but from the history we could gather no indication as to the cause of this low percentage. On August 1, 1900, a complete hysterectomy was done. Convalescence was normal and the patient was up in a wheel chair on the 10th day. Frequent stools began on the 17th day and continued to the 22d day. In spite of appropriate treatment the patient died on the 28th day. She was delirious for several days and had fever for three days before death.

*Tubal pregnancy.* Although in Case 10678 the hæmoglobin was only 15 per cent, the patient stood the operation fairly well but died on the following day. In Case 15314 at the time of operation the hæmoglobin was 32 per cent. Most patients with such a percentage would be considered a fair risk. The only two cases of extra-uterine pregnancy that I personally have ever lost each had a complicating general peritonitis associated with intestinal obstruction.

*Tubal pregnancy, hæmoglobin 15 per cent. Removal of Fallopian tube; death.* Gyn. No. 10678. Path. No. 6910. L. McG., aged 25, white. Admitted to the Johns Hopkins Hospital August 23, 1903, died August 25, 1903. This patient was exceedingly ill when brought to the hospital. She had felt perfectly well until a week before admission. Her last menstruation had occurred five weeks previously. She had been bleeding a little every day for two weeks and one week before admission she had been seized with violent cramp-like pain in the right side. Similar attacks had occurred a couple of times during the week. When she came to the hospital she was exceedingly dizzy and very pale. Her hæmoglobin was 15 per cent. Shortly after admission on the same day the right tube was removed.

After operation the temperature was 101° F., pulse 160. The patient was exceedingly pale, and dizzy. Stimulants were employed, but on the following day the pulse became rapid and weak, the temperature rose and at 6 p. m. was 105.5°. The patient became delirious, extremely restless and died at 8.30 p. m., August 25th. Her hæmoglobin at that time was 10 per cent.

*Extra-uterine pregnancy with a hæmoglobin of 32 per cent. at operation; death.* Gyn. No. 15314. K. W., aged 35, married. Admitted to the Johns Hopkins Hospital November 26, 1908, died December 1, 1908. She gave a history of having had no children for 13 years. She had missed her period for two months when there commenced to be a slight hæmorrhagic discharge. She was suddenly taken with severe abdominal pain; her skin became cold and clammy and she was in a condition of shock. Her physician immediately brought her to the hospital, but at that time operation was entirely out of the question. After appropriate treatment she rallied somewhat but nausea and vomiting per-

sisted. On November 28th the hæmoglobin was 32 per cent. There was much abdominal pain and distention and operation seemed to afford the only hope. When the abdomen was opened an extra-uterine pregnancy on the right side about the size of a two months' fetus was found. The abdomen was filled with bright red blood. As far as possible this was evacuated. The patient became gradually worse, grew irrational and died at 4 A. M. December 1st.

*Tubo-ovarian abscess.* The death in Case 10303 was without doubt due to the dissemination of the streptococcus infection that already existed in the tubo-ovarian abscess. The percentage of hæmoglobin was not excessively low and had it not been for the virulence of the streptococcus this patient should have recovered.

*Tubo-ovarian abscess, hæmoglobin 38 per cent., death.* Gyn. No. 10303. I. S., aged 26, white. Admitted to the Johns Hopkins Hospital April 6, 1903, died April 11, 1903. This patient had been married three years; had had no children and no miscarriages. For a year she had noticed pain in her right side low down along Poupard's ligament and high up in the groin. The pain was of a dull type and came on at different times, was never constant, never severe. The patient was supposed to have had typhoid in August, 1902. She suffered from severe headache, nausea and vomiting and the abdomen became swollen. There was severe pain paroxysmal and sharp. The abdomen was prominent in the mid-line and on the right side. The patient was very ill at that time, but finally recovered. During the winter at various intervals she had vomiting spells bringing away tarry blood, but she had had no vomiting of this character for three months before admission. She had lost a great deal in weight and had had slight pain on micturition. On admission the patient was poorly nourished. The abdomen was scaphoid and was tender everywhere. A vaginal examination was not made at that time on account of the extreme tenderness.

Operation April 18, 1903. A right tubo-ovarian abscess was removed. At the time of operation her hæmoglobin was 38 per cent; the leucocytes were 6500. After operation she developed a streptococcus peritonitis. She had several attacks of dyspnea, but no cyanosis, and vomited occasionally. She suddenly grew worse, and died on April 11th.

No complete autopsy could be obtained.

*Squamous-cell carcinoma of the cervix.* Patients with advanced cancer of the cervix are invariably bad risks even though the hæmoglobin index is high. When it is low the immediate outlook after operation is always gloomy.

*Squamous-cell carcinoma of the cervix in a patient with a haemoglobin of 30 per cent. Abdominal hysterectomy; death.* Gyn. No. 9362. I. H., married, white, aged 31. Admitted to the Johns Hopkins Hospital January 25, 1902, complaining of a bloody offensive vaginal discharge, and discomfort in abdomen and back. She had had six children, no miscarriages. The bloody discharge had persisted for a year and a half, was slightly offensive, pale pinkish in color. The condition had gradually grown worse during the last nine months, and she had had bearing down pains. There had been a good deal of swelling in the abdomen for the last two years. The cervix was replaced by a deep excoriation 3 to 4 cm. across, and extending far into the uterine cavity. It encroached very closely on the base of the bladder. The body of the uterus was almost normal in size.

On February 6, 1902, an abdominal hysterectomy was performed. Following operation there was marked gastric and intestinal distention and excessive vaginal bleeding. The patient's haemoglobin on her admission was 30 per cent., but prior to operation it had risen to 50 per cent. Death occurred on February 9, 1902.

The autopsy showed localized fresh peritoneal adhesions, haemorrhages into various pelvic structures, acute fibrinous pleurisy, acute diphtheritic and haemorrhagic colitis.

It will be noted that in this case the patient really had a haemoglobin of more than 40 per cent. It was below 40 when she entered the hospital, but at the time of operation the percentage was 50.

*Squamous-cell carcinoma of the cervix with a haemoglobin of 35 per cent. Vaginal hysterectomy; death.* Gyn. No. 9387. M. E. M., married, aged 46, white. Admitted to the Johns Hopkins Hospital February 5, 1902. This patient complained of an offensive white vaginal discharge which was sometimes blood-tinged. She had had ten children and one miscarriage. A year before admission she had had a milky vaginal discharge small in amount, now and then irritating, but not offensive. This had become greenish in color and streaked with blood. In October she had a haemorrhage and lost a great deal of blood. At that time she had haemorrhages every two or three days for two weeks. The cervix was curetted and a diagnosis of squamous-cell carcinoma made (Path. Nos. 5574 and 5627). Vaginal hysterectomy was done on February 26, 1902; the patient died about noon on the following day. After operation the pulse, which was exceedingly weak, became stronger and rose to 144. About 4:30 next morning she complained of difficulty in getting her breath and the respirations were gasping in character, 30 per minute. She died on Feb. 27th.

In this case it may be noted also that the haemoglobin was 35 per cent when the patient was admitted to the hospital on February 5th, but before operation on February 25th it had increased to 54 per cent. so that the operation itself was not done on a patient with a haemoglobin under 40 per cent.

*Squamous-cell carcinoma of the cervix, haemoglobin 15 per cent., minor palliative operation; death.* Gyn. No. 16132. Path. No. 14305. B. J., colored, aged 32. Admitted to the Johns Hopkins Hospital October 29, 1909, died November 11, 1909. This patient had been married 4 years, and had had two children, no miscarriages. There was a moderate white vaginal discharge. For six months she had had severe abdominal pain and the last three months this had become gradually worse and continuous and she had been having irregular uterine bleeding. She had passed many large clots. The bleeding on admission was very profuse. Urination had been frequent and painful, and the patient had lost a great deal in weight and strength.

On vaginal examination the cervix was found firm and rounded. The anterior lip was hypertrophied, the posterior roughened, and indurated, on each side of the cervix was a mass extending up from the cervix. This was firm and immobile. A diagnosis of myomatous uterus, densely adherent and malignant, was made. This patient had a haemoglobin of 15 per cent.; leucocytes 34,000. It was clearly recognized that a radical operation could not be performed, but on account of the leucocytosis it was deemed wise to do a posterior vaginal drainage. Drainage was also made through the abdominal walls at numerous points. It was realized that little could be done, particularly on account of the low haemoglobin and the fact that the patient was suffering from mitral stenosis and insufficiency in addition to the local trouble. After operation the patient steadily grew worse and died on November 11th. Carcinomatous masses were found filling the entire pelvis. These were rigid and immobile and there were extensions to the peritoneal viscera and the omentum contained implantations from the growth.

Path. No. 14305. The diagnosis of the tissue from the cervix was squamous-cell carcinoma.

*Squamous-cell carcinoma of the cervix with a haemoglobin of 33 per cent. Abdominal hysterectomy, death.* Gyn. No. 18341. I. G., aged 34, white. Admitted to the Johns Hopkins Hospital April 27, 1912, died May 13, 1912. This patient complained of pain in the hip, but chiefly of vaginal bleeding. She had been married fourteen years and had six children, the eldest 13, the youngest 10, and one miscarriage seven years before admission. Three months before, she commenced to have slight vaginal bleeding, but thought that it was a return of the menstrual flow. This bleeding had been getting worse and accompanied by clots. There would be sudden haemorrhages which made her very weak. She had lost a great deal of blood. The cervix was hollowed out, irregular and friable and almost 8 or 9 cm. in diameter and the growth had extended laterally into the vaginal fornices. The fundus could not be made out. Haemoglobin 33 per cent.

On April 29, 1912, abdominal hysterectomy was performed. The patient's condition was satisfactory up to May 7th, when she tried to get out of bed.

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Her pulse rose to 140 and her temperature to 102.5°. She was still unruly and now asked for morphine continually and complained of pain in her abdomen. The abdomen was soft and there was no induration. Pelvic examination showed that the drainage tract was partly open. A very hard and irregular nodule could be felt which appeared to be carcinomatous. The patient died suddenly at 4 A. M. on May 13, 1912. From the history there was no definite indication as to the cause of death. No autopsy was accorded.

*Carcinoma of the body of the uterus.* In Case 9911 the hemoglobin was 35 per cent. and the growth had extended to the vagina, necessitating the removal of not only the entire uterus, but also of the vagina. Such an operation would tax the patient's endurance to the utmost were her hemoglobin nearly normal.

*Adenocarcinoma of the body of the uterus with a hemoglobin of 35 per cent. and implantations in the vagina. Hysterectomy; death.* Gyn. No. 9911. M. B. G., married, aged 53, white. Admitted to the Johns Hopkins Hospital on September 17, 1902, died October 23, 1902. This patient complained of hemorrhage from the uterus, of leucorrhoea and of great loss of strength. She had been married 38 years, had had nine children, no miscarriages. She had been perfectly well up to the onset of the bleeding in November, 1901. Previous to this she had had no menstrual flow for five months. After this bleeding the periods had been excessive, coming on at irregular intervals up to the time of admission. She also had had an offensive vaginal discharge which was very irritating, and considerable discomfort in the abdomen. She had become steadily weaker, dizzy and short of breath. On admission she was moderately fat but anæmic. Her hemoglobin was 35 per cent., leucocytes 7800. Situated just to the left of the urethral orifice was a hard indurated mass. This was excised and the wound closed. All around the urethra there was induration. The cervix was somewhat enlarged, the fundus had a very limited mobility. On dilatation of the cervical canal a large amount of very foul pus escaped. The body of the uterus was curetted, a mass of carcinomatous tissue coming away.

On September 22, 1902, an abdominal hysterectomy was performed. The entire vagina was removed with the uterus. The patient died on the following day. No complete autopsy was allowed, but it was seen that the abdominal incision showed no signs of peritonitis. There was no evidence of healing.

It will be noted that in this case after the dilatation of the cervix and removal of the pus from the uterine cavity a long interval elapsed before the hysterectomy was performed, in order that the danger of general infection might be minimized.<sup>1</sup>

*Adenocarcinoma of the ovary.* Where abdominal carcinosis exists the resistance to infection is always lowered. It will be noted that in Cases 7610 and 10099, when the abdomen was opened it was found impossible to remove the growth and the abdomen was closed. In Case 10366 it was necessary to remove all the pelvic organs. In this case death was in all probability due to peritonitis.

*Ovarian carcinoma, hemoglobin 27 per cent.; exploratory laparotomy; death.* Gyn. No. 7610. R. L., colored, aged 47. Admitted to the Johns Hopkins Hospital on March 1, 1900, died March 18, 1900. The patient complained of an abdominal tumor. She had been married 26 years, but had had no children and no miscarriages. Her menses had ceased ten months before admission, and up to that time she had been quite well. Since that time she had had persistent nausea and vomiting increasing in severity, and some shortness of breath. Prior to the appearance of the tumor she was a much stronger looking woman. On her admission to the hospital she was very pale, emaciated; hemoglobin 27 per cent. The abdomen was occupied by an immense cystic fluctuating mass giving the abdomen a dome-like and extremely tense appearance. The circumference of the abdomen at the umbilicus was 108 cm. The tumor filled the abdomen so fully that it could not be moved at all. On vaginal examination it was noted that the right labium majus was hypertrophied, the outlet nulliparous. The cervix was small and soft and the uterus could not be outlined.

On March 5, 1900, an exploratory operation was done under Schleich's solution. The abdomen was filled with what appeared to be a solid ovarian carcinoma which was adherent to the abdominal wall. No attempt was made to remove the tumor. The patient gradually grew weaker. Nausea and vomiting persisted, the dyspnoea increased. The temperature was 96.4°. The patient died suddenly on March 18th.

*Carcinoma of the ovary, hemoglobin 35 per cent.; exploratory laparotomy; death.* Gyn. No. 10099. D. A. M., aged 35, white. Admitted to the Johns Hopkins Hospital on November 21, 1902, died November 28, 1902. She complains of an abdominal tumor. She has been married 13 years, has had three children and no miscarriages. One year ago she noticed that she was growing weaker and at the same time detected a small lump in the lower abdomen. This was not especially hard or painful. The periods ceased and there has been no flow since then. Prior to this time the periods had been longer than usual and more profuse. There had been a great deal of pain and a dull sensation during the last two days of the flow. The tumor has increased more rapidly in size during the last two or three months. Her appetite has been fair, but she has

<sup>1</sup>The pathological numbers in this case are 6126, 6112, 6139 and 6148.

TABULATION OF THE PATIENTS ENTERING THE GYNECOLOGICAL DEPARTMENT OF THE JOHNS HOPKINS HOSPITAL WITH A HEMOGLOBIN OF 40% OR LESS. NEARLY ALL UNDERWENT AN OPERATION OF SOME CHARACTER AND ALL IN THIS GROUP SURVIVED

Gyn. No.	Initials	Color	Age	Date of Admission	Path. No.	Diagnosis	Hemoglobin on admission	Operation	Hemoglobin after operation	Date of Discharge	
5759	M. J.	W.	32	Dec. 22, 1897	2057	Retained placental tissue	38%	Curettage	46% 53%	Jan. 8 Jan. 16	Jan. 23, 1898
5783	K. M.	W.	42	Jan. 11, 1898	2079	Polypoid endometrium; slight hyperplasia	31%	Curettage			Transferred to Medical side Jan. 17, 1898
5976	L. V.	W.	20	Mar. 24, 1898	2170	Slight hyperplasia of endometrium with polypoid formation	17%	Curettage			April 16, 1898
6002	A. G.	W.	34	Apr. 5, 1898	2275	Submucous myoma	24%	Vaginal removal of tumor			April 22, 1898
6128	S. H.	W.	53	May 26, 1898	2380	Polypoid endometrium with slight hyperplasia	33%	Curettage			July 1, 1898
6164	M. T.	W.	32	June 14, 1898	2424	Retained placental tissue	38%	Curettage, repair of perineum, suspension of uterus			Transferred June 28, 1898
6615	E. J.	C.	34	Jan. 3, 1899	2887	Chronic endometritis, pyosalpinx, uterine myomata	30%	Hysteromyectomy; salpingo-oophorectomy	27% 32%	Feb. 3, 1899 Feb. 10, 1899	Feb. 28, 1899
6631	J. H.		54	Jan. 11, 1899	2915	Uncontrollable uterine hemorrhage, adenomyoma; gland hypertrophy	24%	Vaginal hysterectomy	30% 44%	Jan. 24, 1899 Feb. 9, 1899	Mar. 5, 1899
6689	F. H.	W.	24	Feb. 7, 1899	2925	Cystic ovaries	25%	Removal of tubes and ovaries. Previous history (No. 5728), curettage; no microscopic examination. No. 6621, uterine polypus. Hysterotomy Apr. 27, 1898. Path. No. 2312 Polypoid mucosa with gland dilatation, hyperplasia	32% 35%	Feb. 26, 1899 Mar. 7, 1899	Mar. 10, 1899
6959	N. S.	W.	27	May 29, 1899	3137	Right tubal pregnancy	40%	Removal of both tubes and ovaries			July 11, 1899
7313	L. H.	W.	45	Oct. 25, 1899	3376	Spindle-cell sarcoma of uterus. Subacute salpingitis	38%	Hysteromyectomy; salpingo-oophorectomy (see page 105 Myomata of Uterus Kelly and Cullen.)			Nov. 29, 1899
7438	A. W.	W.	43	Dec. 13, 1899	3759	Uterine myoma	19%	Hysterosalpingo-oophorectomy. (Bisecton)	20% 38% 48%	Dec. 22, 1899 Dec. 28, 1899 Jan. 6, 1900	Feb. 10, 1900
7454	M. H.	W.	40	Dec. 18, 1899	3691	Squamous-cell carcinoma of cervix	35%	Vaginal hysterectomy			Feb. 7, 1900
7564	M. W.	C.	50	Feb. 7, 1900	3820 3641	Squamous-cell carcinoma of cervix; with uterine myomata	22%	Vaginal hysterectomy	19% 37% 44% 53%	Feb. 23 Mar. 6 Mar. 25	Apr. 28, 1900
7615	A. R.	W.	51	Mar. 3, 1900	3879	Submucous myoma; cervical polyp	39%	Removal of polyp and myoma			Mar. 17, 1900
7784	S. W.	W.	42	Apr. 30, 1900	4045	Ruptured tubal pregnancy	20%	Removal of tube			May 24, 1900
7786	E. W.	W.	51	May 3, 1900	4040	Squamous-cell carcinoma of cervix	30%	Curettage			May 24, 1900
7794	E. H.	W.	35	May 7, 1900	4046	Retained placenta	35%	Removal of adherent placenta			May 17, 1900
7819	S. B.	W.	40	May 15, 1900	4074	Squamous-cell carcinoma of cervix with uterine myomata; pelvic adhesions	35%	Hysterectomy			June 12, 1900

7840	F. N.	W.	44	May 22, 1900	4083	Squamous-cell carcinoma of cervix; uterine myomata	38%	Vaginal hysterectomy			
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7840	F. N.	W.	44	May 22, 1900	4083	Squamous-cell carcinoma of cervix; uterine myomata	38%	Vaginal hysterectomy; right salpingo-oophorectomy		June 16, 1900
7846	L. T.	W.	38	May 24, 1900	4094	Excessive uterine bleeding; slight hyperplasia of the endometrium	40%	Curettag		June 2, 1900
7859	A. B.	W.	37	May 29, 1900	4122	Adenomyoma of uterus; hydrosalpinx	30%	Hysteromyectomy with removal of appendages	50%	June 20, 1900
7900	E. A.	C.	37	June 12, 1900		Inoperable carcinoma of cervix	30%	Ether examination only		July 3, 1900
7908	K. N.	W.	33	July 16, 1900	4154	Retained membranes	23%	First operation, curettage; second, repair of cervix and anterior and posterior vaginal walls	34% 47%	June 30, 1900 July 22, 1900
7934	A. E. H.		38	June 26, 1900	4169	Uterine myoma	40%	Hysterosalpingo-oophorectomy		July 20, 1900
8042	E. R.	C.	33	Aug. 5, 1900	4269	Retained placenta	30%	Curettag	55%	July 20, 1900
8130	R. M. F.	W.	48	Sept. 11, 1900	4356	Submucous uterine myoma; pelvic adhesions	28%	Pan hysterectomy	37% 48%	Sept. 26, 1900 Oct. 21, 1900
8146	B. W.	C.	22	Sept. 20, 1900	4359	Chronic endometritis	40%	Curettag		Sept. 30, 1900
8219	E. F. W.			Oct. 11, 1900	4399	Adenocarcinoma of omentum, (origin?)	25%	Exploratory laparotomy		Oct. 23, 1900
8369	J. H.	W.	36	Dec. 5, 1900	4553	Hemorrhoids	25%	Suspension of uterus, Whitehead operation,		Jan. 5, 1901
8413	H. M.	W.	44	Dec. 20, 1900	4374 4579	Polypoid endometrium; gland hypertrophy	25%	First operation, Dec. 31, curettage; second operation, Jan. 16, hysterosalpingo-oophorectomy	38% 47% 52%	Jan. 6, 1901 Jan. 23, 1901 Feb. 4, 1901
8907	M. S.	W.	56	July 6, 1901	5103	Adenocarcinoma of ovary with metastases	40%	Hysterosalpingo-oophorectomy with removal of portion of omentum		Aug. 13, 1901
8934	L. P.	W.	40	July 20, 1901	5170	Submucous myoma	35%	Pan hysteromyectomy		Aug. 15, 1901
8936	S. A. E.	W.	35	July 22, 1901		Multiple uterine myomata; submucous myoma, menorrhagia, anemia	15%		25% 45% 35%	Oct. 2 Oct. 15 Oct. 20
9070	Readmitted			Sept. 17, 1901			35%	No operation		Oct. 31, 1901
9051	E. M.	W.	48	July 26, 1901	5128	Uterine myoma	35%	Vaginal hysterectomy (bisection)		Sept. 3, 1901
9069	E. B.	W.	22	Aug. 22, 1901	5173	Mild chronic endometritis, slight gland hypertrophy	40%	Curettag		Sept. 6, 1901
9064	M. W.	C.	40	Aug. 22, 1901	5243	Squamous-cell carcinoma of cervix; uterine myoma	35%	Vaginal hysterectomy, right salpingo-oophorectomy		Oct. 15, 1901
9053	H. W.	W.	43	Sept. 11, 1901	5274	Uterine myoma	35%	Hysterosalpingo-oophorectomy	37% 42%	Sept. 18 Oct. 2
9130	O. G. C.	W.	26	Oct. 16, 1901		Pelvic inflammation; post-operative focal fistula; pulmonary tuberculosis	38%	No operation. (Pyometria evacuated in Suffolk, Va.; later abdominal operation, Norfolk, Va., March, 1902)		Oct. 31, 1901
9200	I. F. D.	W.	23	Nov. 7, 1901	5374 5376	Retained placenta Polypoid endometrium	37%	First operation, curettage; second operation, suspension of uterus, repair of outlet		Dec. 21, 1901
9266	E. C. H.	W.	47	Dec. 9, 1901	5460	Squamous-cell carcinoma of cervix	38%	Curettag		Dec. 30, 1901
9241	U. P.	W.	30	Dec. 24, 1901	5495	Uterine myoma, polypoid endometrium	22%	Pan hysterectomy	25% 35%	Dec. 29, 1901 Jan. 14, 1902
9312	F. S.	W.	35	Jan. 5, 1902		General peritoneal carcinoma	35%	Abdominal paracentesis. First, Jan. 9; second, Jan. 13; third, Jan. 17	30%	Jan. 8
9340	S. L. D.			Jan. 10, 1902	5537	Uterine polyp, moderate gland hyperplasia	20%	Hysterosalpingo-oophorectomy		Feb. 17, 1902



10130	L. W.	W.	20	Dec. 11, 1902	6134 6348	Moderate hyperplasia of endometrium with thrombosis of veins of mucosa, right pyosalpinx	33%	Curettag; right salpingo-ophorectomy	12% 66%	Dec. 21, 1902 Jan. 9, 1903	Feb. 6, 1903
10148	F. L.	W.	31	Dec. 25, 1902		Retained placenta	10%	Removal of placenta	22% 20% 22% 31% 41%	Jan. 8 Jan. 11 Jan. 19 Jan. 19 Jan. 23	Jan. 23, 1903
10165	L. E.	W.	38	Jan. 4, 1903	6358	Menorrhagia; hyperplasia of endometrium	55%	Hysterectomy	20% 32%	Jan. 20 Feb. 10	Feb. 11, 1903
10170	G. G.	W.	27	Jan. 6, 1903	6359	Tubal pregnancy; endometrium of pregnancy	40%	Curettag; right salpingo-ophorectomy	30% 37% 45%	Jan. 8 Jan. 10 Jan. 19	Feb. 6, 1903
10172	W. A. B.	C.	41	Jan. 6, 1903	6431	Uterine myoma	20%	Hysteromyomectomy; double salpingo-ophorectomy	37% 38% 29% 37% 44% 42% 47% 53%	Jan. 13 Jan. 19 Jan. 22 Jan. 28 Feb. 3 Feb. 8 Feb. 23 Feb. 27	Feb. 28, 1903
10287	J. M. M.	W.	48	Feb. 25, 1903	6490	Uterine myoma	35%	Hysteromyomectomy; radical cure of hernia	42%	Mar. 20, 1903	Mar. 21, 1903
10294	M. F. N.		48	Feb. 26, 1903	6511	Uterine myoma	35%	Hysteromyomectomy			Mar. 25, 1903
10376	M. S.	W.	45	April 1, 1903	6396	Submucous myoma with hyaline changes (sarcomatous?)	30%	Vaginal myomectomy			April 17, 1903
10490	M. D.		37	April 13, 1903	6627	Relaxed outlet retroposed uterus, slight hyperplasia of endometrium	35%	Curettag; repair of perineum, suspension of uterus	30%	May 6	May 6, 1903
10455	E. D.		46	April 30, 1903	6670	Submucous uterine myoma	40%	Hysterosalpingo-ophorectomy; radical cure of hernia			May 23, 1903
10572	E. H.	W.	44	June 18, 1903	6803	Hyperplasia of endometrium with polypoid formation	35%	Abdominal panhysterectomy	45%		July 11, 1903
10573	K. H.	W.	27	June 22, 1903	6821	Cystic uterine myoma	38%	Multiple myomectomy			July 20, 1903
10597	N. B.		42	July 7, 1903		Submucous myoma	25%	Operation refused	35%		July 24, 1903
10605	A. E. M.	W.	38	July 13, 1903	6863	Uterine myoma, chronic pelvic adhesions	30%	Hysterosalpingo-ophorectomy	51%		Aug. 14, 1903
10618	E. C.			July 18, 1903	6847	Uterine myoma submucous	40%	Vaginal myomectomy			Aug. 5, 1903
10829	C. J.			Oct. 26, 1903	7020	Extra-uterine pregnancy	30%	Removal of tube	66%	Nov. 22, 1903	Nov. 24, 1903
10838	S. S. H.			Oct. 29, 1903	7042	Carcinoma, body of uterus	40%	Panhysterectomy	45% 33%	Nov. 6 Nov. 24	Nov. 25, 1903
10849	M. E. M.	W.	40	Nov. 5, 1903		Squamous-cell carcinoma of cervix	10%	Inoperable			Nov. 27, 1903
10902	B. T.	W.	28	Nov. 24, 1903	7104	Menorrhagia, slight hyperplasia of endometrium	14%	Curettag	10% 20% 23%	Nov. 27 Dec. 7 Dec. 13	Dec. 13, 1903
11049	D. E.	W.	28	Feb. 6, 1904	7272	Menorrhagia, hyperplasia of endometrium	25%	Curettag			Feb. 24, 1904
11077	L. E.		40	Feb. 23, 1904	7308	Uterine myoma	22%	Hysterosalpingo-ophorectomy	21% 29% 34% 40% 50% 58% 82%	Mar. 8, 1904 Mar. 11 Mar. 15 Mar. 27 Mar. 25 April 3 April 7	April 7, 1904



TABULATION OF THE PATIENTS—Continued

Gyn. No.	Initials	Color	Age	Date of Admission	Path No.	Diagnosis	Hemoglobin on Admission	Operation	Hemoglobin after Operation	Date of Discharge
11339	R. J.	C.	43	Mar. 24, 1904	7393	Uterine myoma, pelvic adhesions	25%	Hysterosalpingo-oophorectomy	28 $\frac{0}{100}$ Mar. 20 25 $\frac{0}{100}$ April 3 25 $\frac{0}{100}$ April 5 20 $\frac{0}{100}$ April 19 40 $\frac{0}{100}$ April 25	April 30, 1904
11398	M. P.		47	Mar. 5, 1904	7310	Squamous-cell carcinoma of cervix	33%	Curettag		Mar. 23, 1904
11325	L. G.	W.	27	June 1, 1904		Prolapsed rectum	36%	Reduction of prolapsed rectum	60 $\frac{0}{100}$ July 15 75 $\frac{0}{100}$ July 26 90 $\frac{0}{100}$ Aug. 9	Aug. 9, 1904
11347	S. J. P.	W.	43	June 10, 1904		Menorrhagia	28%			Transferred to medical side June 12, 1904
11555	E. P.		53	Sept. 21, 1904		Large ovarian cyst	40%	Operation refused		Sept. 24, 1904
11278 11562	E. W.		31	Sept. 24, 1904	7805 7832	Chronic ulcer of cervix	40%	Curettag of cervix		Oct. 28, 1904
11652	M. C.			Oct. 26, 1904	7871	Acute endometritis	23%	Curettag	15 $\frac{0}{100}$ Nov. 13 18 $\frac{0}{100}$ Nov. 20	Dec. 7, 1904
11743	M. B.	C.	38	Dec. 5, 1904	8024	Submucous myoma	23%	Vaginal myomectomy	42% Dec. 16	Dec. 16, 1904
11750	S. G.		16	Dec. 12, 1904	8031	Glandular hyperplasia, polypoid condition of endometrium	35%	Curettag	40 $\frac{0}{100}$ Dec. 23 48 $\frac{0}{100}$ Jan. 2	Jan. 2, 1905
11762	S. C.		38	Dec. 17, 1904	8030 8040	Carcinoma of body of uterus and cervix	35%	Vaginal removal of portion of uterus	40% Jan. 3	Jan. 3, 1905
11764	C. V. E.		39	Dec. 19, 1904	8054	Acute salpingitis	28%	Double salpingectomy	38%	Jan. 9, 1905
11815	L. G. M.	C.	24	Jan. 17, 1905	8139 8148	Tubal pregnancy, decidual cast of uterus	28%	Right salpingo oophorectomy	60%	Feb. 14, 1905
11830	R. B.	W.	23	Jan. 22, 1905		Ruptured extra-uterine pregnancy, encapsulated collection of blood in cul-de-sac	35%	Vaginal section, removal of blood clots	55%	Feb. 28, 1905
11889	L. V. G.			Feb. 13, 1905		Infected submucous myoma	14%	Partial vaginal myomectomy	20 $\frac{0}{100}$ Feb. 26 26 $\frac{0}{100}$ Mar. 17 60 $\frac{0}{100}$ April 9	April 11, 1905
11893	C. F.			Feb. 18, 1905		Retained membranes	40%	Curettag		Feb. 27, 1905
11919	G. H. O.			Feb. 27, 1905	8541	Adenomyoma, gland hypertrophy, Graafian follicle cyst, chronic pelvic adhesions	40%	Hysteromyectomy, double salpingo-oophorectomy	60 $\frac{0}{100}$ May 17	May 17, 1905
11934	J. H.		37	Mar. 3, 1905		Inflammation of pelvic structures	30%	None	55% Mar. 14	Mar. 23, 1905
11750 12079	S. B. G.			April 23, 1905	8562	Hyperplasia of uterine mucosa with gland dilatation	40%	Curettag with cauterization of uterine cavity	48%	April 28, 1905
12086	A. H.		37	April 29, 1905		Uterine myoma	40%	Hysteromyectomy, double salpingo-oophorectomy	35 $\frac{0}{100}$ May 10 40 $\frac{0}{100}$ May 20	June 20, 1905
12234	E. W.		38	July 13, 1905	8844	Subacute inflammation of cervix, uterine myoma, glandular hypertrophy	25%	Hysteromyectomy, double salpingo-oophorectomy	45%	Aug. 26, 1905

CULLEN: OPERATIONS ON PATIENTS WITH LOW HEMOGLOBIN

12312	M. H.	47	July 26, 1925	8564	Slaughing submucous myoma	49%	Vaginal myomectomy	35%	Aug. 15, 1925
12445	A. M.	36	Oct. 26, 1925	12585	Abnormal cervical tissue, with development of abnormal uterine cervix, after removal of parovarian cyst	45%	Incision and drainage of abscess, suture of cervix		Dec. 31, 1925
12896	E. W.	34	May 1, 1926	9339	Uterine myoma, Graafian follicle cyst and parovarian cyst	45%	Hysteromyomectomy, double salpingo-oophorectomy	35%	June 5, 1926
33344	E. N.	43	Oct. 30, 1926	12320	Polypoid endometrium, gland hyperplasia, pelvic adhesions	30%	Hysteromyomectomy, double salpingo-oophorectomy	34% 1st day 34% 2d day 30% 3d day 28% 4th day 25% 5th day	Dec. 11, 1926
13216	E. F.		Nov. 13, 1926		Squamous-cell carcinoma of cervix	49%	Operation refused, although case very favorable		Nov. 18, 1926
13207	J. M.	42	Nov. 28, 1926	12582	Adenomyoma of uterus, submucous myoma, acute endometritis, double pyosalpinx	49%	First operation, hysteromyomectomy, salpingo-oophorectomy, double salpingo-oophorectomy	65%	Dec. 21, 1926
13345	K. F.		Jan. 29, 1927	10843	Carcinoma of cervix, uterine myoma, pyosalpinx	49%	Panhysterectomy, double salpingo-oophorectomy		April 3, 1927
13364	M. B.	38	Feb. 5, 1927		Abcess of left broad ligament	37%	Drainage of abscess	64%	Mar. 4, 1927
13681	L. S.	74	Feb. 17, 1927	15037	Ovarian cyst, abscess of right broad ligament, general peritonitis, albuminuria	59%	Incision and drainage	41% 69%	April 28, 1927
13826	M. E.		May 9, 1927		Pelvic abscess	59%	Pelvic drainage	59%	May 26, 1927
13853	R. B.	19	May 26, 1927	11285	Glandular hyperplasia	20%	Curetage	51%	June 18, 1927
13945	M. T.	39	June 21, 1927		Inoperable carcinoma of cervix	19%	None		June 21, 1927
13986	M. S.		July 6, 1927	11127	Squamous-cell carcinoma of cervix	49%	Exploratory hysteromyomectomy, incision of adhesions, cervical curettag		July 21, 1927
14959	N. B.		Aug. 5, 1927	11664	Slight hyperplasia of endometrium, cystic degeneration of ovary	49%	Hysterotomy with curettag, left oophorectomy, cystectomy	31%	Aug. 27, 1927
14960	A. M.	39	Aug. 3, 1927	11537	Uterine myoma, adenomyoma, cystic degeneration of ovary	35%	Panhysterectomy, double salpingo-oophorectomy	64%	Aug. 26, 1927
14247	S. W.	40	Oct. 4, 1927	11924	Double hydrosalpinx, uterine myoma, chronic endometritis	39%	Hysterectomy, double salpingo-oophorectomy	36%	Oct. 21, 1927
44435	C. S.	46	Dec. 27, 1927	12107	Uterine myoma, chronic salpingitis, chronic endometritis	39%	Hysteromyomectomy, salpingo-oophorectomy		Feb. 4, 1928
44203	M. R.		Jan. 27, 1928	12294	Gravid uterus, chronic degeneration of ovaries, chronic salpingitis	39%	Hysteromyomectomy, double salpingo-oophorectomy	49% Feb. 4 49% Feb. 9	Mar. 27, 1928
44344	M. S.	27	Feb. 3, 1928		Amegastrosis, infarcted pelvic organs, chlorosis	30%	Rhler examination only	40%	Feb. 24, 1928
44583	K. H.	49	Apr. 15, 1928	12454	Gland hyperplasia	15%	Curettag	31%	April 21
44601	S. A.	73	May 17, 1928		Bleeding since birth of child, retained membranes	17%	Not treated		Transferred May 9, 1928
43414	S. S.	20	Oct. 21, 1928	13135	Ruptured tubal pregnancy	35%	Resection of left uterine cornu, suture of uterine incision, removal of intraligamentary and uterine adhesions		Nov. 8, 1928
12323	C. L. B. C.	33	Oct. 11, 1928	13136	Ruptured tubal pregnancy	35%	Right salpingectomy		Nov. 18, 1928

TABULATION OF THE PATIENTS—Continued

Gyn. No.	Initials	Color	Age	Date of Admission	Path. No.	Diagnosis	Hemoglobin on admission	Operation	Hemoglobin after Admission	Date of Discharge
15547	E. J.	C.	23	Feb. 20, 1909	13486 13334	Tuberculosis of endometrium, myoma, normal tubes, cystic ovary, chronic appendicitis	21%	Hysterectomy, double salpingectomy, left oophorectomy. Appendectomy		Mar. 9, 1909
15745	C. L.		30	May 6, 1909	13785	Chronic endometritis	21%	Curetage		May 15, 1909
15838	P. M.	W.	33	June 19, 1909	13829	Hypertrophy of cervix	30%	Amputation of cervix, (post-operative hemorrhage from cervix), repair of relaxed vaginal outlet		July 16, 1909
15935	M.A.W.		36	Aug. 3, 1909	13959	Uterine myoma, retained membranes	34%	Curetage		Aug. 15, 1909
16001	L. M.		28	Aug. 30, 1909	14157	Uterine myoma, normal cervix, left hydrosalpinx, pyosalpinx	40%	Hysteromyomectomy, bilateral salpingo-oophorectomy, release of adhesions		Sept. 17, 1909
16010	L. B.		39	Sept. 3, 1909	14150	Early adenomyoma, bilateral chronic salpingitis	40%	Panhysterectomy, myomectomy, double salpingo-oophorectomy		Sept. 18, 1909
16104	K. M.	W.	34	Oct. 11, 1909	14222 14395	Squamous-cell carcinoma of cervix, chronic bilateral salpingitis	39%	Panhysterectomy, double salpingo-oophorectomy, suture of bladder	50% 54%	Oct. 24 Nov. 13, 1909
16264	S. H.	C.	24	Dec. 9, 1909	14496	Metrorrhagia, retroposition of uterus, bilateral cystic ovaries, small corpus fibrosum, chronic appendicitis	35%	Resection of corpus fibrosum, puncture of cyst, appendectomy		Dec. 28, 1909
16290	F. F.	C.	30	Dec. 28, 1909	14557	Tubo-ovarian abscess, chronic bilateral salpingitis, oophoritis	35%	Panhysterectomy, bilateral salpingo-oophorectomy, release of uterine adhesions		Jan. 17, 1910
16294	A. S.	W.	29	Dec. 30, 1909	14673	Acute pelvic inflammation	38%	Pelvic section, opening of old drainage tract		Feb. 19, 1910
16296	M. B.	C.		Dec. 30, 1909	14556	Ruptured tubal pregnancy, ovarian cyst	25%	Left salpingectomy, resection of cyst wall		Mar. 5, 1910
16333	G. G.	C.	33	Jan. 17, 1910	14579 14618	Polypoid endometrium, chronic appendicitis	20%	Curetage, exploratory laparotomy, release of adhesions	33%	Feb. 8, 1910
16405	A. B.		36	Feb. 17, 1910	14751	Pedunculated submucous myoma	15%	Vaginal myomectomy		Mar. 6, 1910
16494	M. W.		30	Mar. 21, 1910	14830	Tubo-ovarian abscess, chronic salpingitis, endometritis, cystic left ovary	40%	Hysterectomy, bilateral salpingo-oophorectomy, appendectomy		April 7, 1910
16603	E. S.	W.	35	April 30, 1910	14989	Adenomyoma (diffuse), uterine polyp, cervicitis, chronic appendicitis	40%	Hysterectomy, myomectomy, right salpingo-oophorectomy, appendectomy		May 26, 1910
16613	H. H.		30	May 5, 1910	14993	Extra-uterine pregnancy	40%	Right salpingectomy	75%	May 27, 1910
17080	M. W.		47	Oct. 31, 1910	15606 15669 15701	Adenocarcinoma of cervix	28%	First operation cauterization and curettage; second operation, panhysterectomy, double salpingo-oophorectomy		Dec. 10, 1910
14544 17322	M. S.	W.	46	Feb. 13, 1911	16063	Amenorrhoea, retroposition of uterus, pulmonary tuberculosis, small mediastinal tumor, chronic appendicitis	30%		68%	Transferred to medical side Feb. 18, 1911
15311 17344	F. P.		31	Jan. 13, 1911	14827 15045	Gland hyperplasia, chronic appendicitis	40%	Curetage, suspension of uterus, repair of relaxed vaginal outlet, appendectomy		Feb. 4, 1911

17377 L. C. C. 36 Mar. 28, 1911 16000 Pelvic melanotic sarcoma with ascites

17377	L. C.	C.	36	Mar. 18, 1911	16000	Pelvic melanotic sarcoma with ascites (origin?)	40%	Exploratory laparotomy		Mar. 28, 11
17438	C. W.	C.	24	April 13, 1911		Ruptured extra-uterine pregnancy (right)	25%	Right salpingo-oophorectomy		April 29, 1911
19446 16886 17609	I. M.	W.	48	June 28, 1911		Squamous-cell carcinoma of cervix	30%	Curettage and cauterization		July 7, 1911
18030	N. F.		27	Dec. 5, 1911	16787	Polypoid endometrium, decidual cells	35%	Curettage		Dec. 11, 1912
18034	N. M.		27	Dec. 6, 1911	16726	Chorio-epithelioma	40%	Curettage	45%	Dec. 15, 1911
18073	R. L. B.		23	Jan. 2, 1912		Retained membranes	30%	Curettage	40%	Jan. 13, 1912
18133	A. W.		49	Feb. 10, 1912		Squamous-cell carcinoma of cervix	12%	Cauterization with actual cautery		Feb. 21, 1912
18185	S. E.	C.	45	Feb. 23, 1912		Uterine myoma	25%	Hysteromyomectomy, double salpingo-oophorectomy		Mar. 10, 1912
18333	M. B.	C.	39	April 24, 1912		Squamous-cell carcinoma of cervix	35%	Cauterization of cervix		May 5, 1912

Grown paler and has lost about 20 pounds. There has been a slight leucorrhœa. Aberration and defecation have been normal. On admission she was rather poorly nourished. The lips and conjunctivæ were very pale. The hemoglobin (November 21st) was 33 per cent. The albumen was 4.180,000, the globulin was 2.000,000, the sugar, diastase and cholesterol were normal, and the uric acid was 0.000,000. No infection could be identified in the tumor. It was fairly well fixed and slightly tender. The cervix was small and jammed up against the symphysis by a rounded mass which filled the cul-de-sac and pushed the fundus forward. The tumor was not movable. On November 23d her hemoglobin had reached 40 per cent., red blood corpuscles 4,180,000, white blood corpuscles 7,280.

Operation November 25th. When the abdomen was opened, the tumor was found to be made up of a number of small thick and thin-walled cysts of various sizes. These were intimately adherent to the intestine and in the pelvis and it was impossible to say from which ovary the tumor had originated. The left broad ligament was plastered over the tumor and many large vessels entered the growth. It was impossible to remove it. After operation the patient's general condition was fairly good for the first day, but on the second she gradually grew worse, was apathetic and vomited some yellow fluid with a rather fecal odor and at the same time expelled the crania which was infectious. The condition gradually grew worse and she died at 6.30 P. M.

No autopsy was obtainable. In this case the low hemoglobin was not due to any uterine hemorrhage, but was probably occasioned by the weakened condition of the patient due to the carcinoma of the ovary which had led to both excessive menses and vomiting from which she lost much of her strength.

*Histology of the ovary: Polypoid endometrium, hamangioma, 38 per cent. Endometrioma with removal of the ovarian structures; death. Gyn. No. 10206. C. S. married, aged 59, colored. Admitted to the Johns Hopkins Hospital March 3, 1903; died March 11, 1905. She had been married 53 years and had had seven children, three miscarriages. On admission she complained of pain in the back and lower abdomen and of a tumor. The pain had persisted since the birth of the last child 16 years before. She had had severe uterine hemorrhages. At first they had come on at the regular periods with severe cramp-like pains in the abdomen. After these had lasted three hours she used to have a severe hemorrhage, the first symptom of the onset of the flow which later lasted from 14 to 21 days. Since January 3d there had been a continuous hemorrhage with the passage of large clots. She had lost a great deal of weight. On admission the patient was rather cachectic; hemoglobin 38 per cent., white blood corpuscles 6500. Through the abdominal walls the pattern of the intercostals was easily demonstrable. The patient had a tumor about the size of a foetal head, globular in form. It was very freely movable and could be brought forward to the abdominal wall. It could be shaved up to the ribs on the left side so*

that it took the position of the kidney. The cervix was enlarged, the body of the uterus was uniformly enlarged, pushed over to the left and adherent. Panhysterectomy with removal of the pelvic structures was performed on March 5, 1903. The patient developed nausea and vomited a dark greenish material. She was markedly constipated, restless, and hicoughed. She gradually grew worse, and died March 11th. No autopsy was allowed.

*Chorio-epithelioma.* This patient (Case 16098) was kept in the hospital for a considerable period before an operation could be undertaken. The cervix was first thoroughly curetted and at a later date a complete hysterectomy done. The case was a desperate one. The patient lived for several months. At autopsy it was found that the left iliac vein was involved in the malignant growth and that the lungs contained metastases. In addition there was a peritonitis and parenchymatous changes were found in the kidneys.

*Chorio-epithelioma. Haemoglobin 35 per cent.; hysterectomy; death.* Gyn. No. 16098, Path. Nos. 14296, 14528. Mrs. A. S., aged 25, white, a Lithuanian. Admitted to the Johns Hopkins Hospital October 9, 1909, died January 2, 1910. Since the birth of her child ten months ago she has never been well. Her menstrual flow has been profuse. The last period occurred one month ago. Between periods there has been a profuse malodorous discharge, at times serous, at other times bloody. Patient has been in bed ten days suffering from pain in the lower abdomen and back; no fever, but very weak.

On examination she is well nourished but anemic, pulse 128, regular but poor in quality. The abdominal walls are soft and very relaxed. Extending to within two fingers' breadth of the umbilicus is a hard nodular mass which is freely movable. This tumor extends three fingers' breadth to the right of the median line. Its surface is irregular, firm in consistency and sensitive. There are chains of inguinal glands on both sides. The typical carcinomatous odor can be detected in the room.

On pelvic examination it is found that the patient is bleeding profusely and there is a fetid discharge. The cervix is large, the canal cavernous, and readily admits the index finger. There is marked loss of tissue around the cervical canal, but a curious absence of induration so common in carcinoma. The tissues are soft and friable. The finger in the uterine cavity detects a large spongy mass, filling the uterus. There is marked induration of the broad ligament. The lower part of the uterus is fixed. Before operation the haemoglobin, on October 9th, was 35 per cent., on November 8th, 36 per cent.; on December 27th, 30 per cent.

Operation, October 11th, curettage; October 18th complete abdominal hysterectomy. After operation the general condition was not good. The pulse was rapid and there was abdominal pain. She grew gradually worse and died on January 2, 1910.

Autopsy. At autopsy it was found that the growth extended out to the pelvic wall on both

sides, further on the left. The left iliac vein was thrombosed. The growth resembled placental tissue. There were metastases in both lungs ranging from the size of a hazelnut to a tangerine orange. The liver showed fatty changes. The kidneys showed chronic parenchymatous degeneration, and the spleen marked amyloid changes. There was emphysema of the lungs, œdema of the left leg, bilateral hydro-ureter, hydromphrosis, acute peritonitis, pleuritis and gastric erosion. In this case, of course, the operation was at a hazard but a palliative procedure.

I have purposely given the briefest outline of our findings, as practically all the essential points are given in the tabulation of cases.

#### DEDUCTIONS

From the foregoing it is clearly evident that, as a rule, patients with a relatively low haemoglobin stand pelvic or abdominal operations fairly well. Where carcinoma of the cervix or body of the uterus exists, however, the dangers are materially increased.

In those cases in which the bleeding is limited entirely to the menstrual period it is well to defer operation until a few days before the next period in order to raise the percentage of haemoglobin to the maximum.

Hyperplasia of the endometrium is a definite disease. The bleeding caused by this condition often leads to a low haemoglobin index, which can be temporarily checked by curetting. Sometimes after two or three curettings in the course of a year the excessive flow ceases. In other cases it is necessary to remove the body of the uterus.

I cannot emphasize too strongly the necessity of becoming thoroughly familiar with the technique of transfusion. This procedure, as simplified by Bernheim, can be readily employed by any surgeon and should not require more than 20 minutes to half an hour. Transfusion will certainly in the near future become a routine procedure in cases in which operations are required on patients with a very low haemoglobin. It is hardly necessary to draw attention to the inadvisability of employing any but the mildest cathartics after operation on such patients. I recently heard of a patient who, notwithstanding a haemoglobin below 20 per cent., weathered a severe abdominal operation. A day or two afterward she was given calomel and salts and promptly died. The after-treatment of these cases requires the greatest care.

REPORT OF THE  
CANCER CAMPAIGN COMMITTEE

Appointed by the Clinical Congress of Surgeons  
of North America

THOMAS S. CULLEN, M.B., Baltimore, Chairman  
E. C. DUDLEY, M.D., Chicago  
C. JEFF MILLER, M.D., New Orleans  
F. F. SIMPSON, M.D., Pittsburgh  
H. C. TAYLOR, M.D., New York

## REPORT OF THE CANCER CAMPAIGN COMMITTEE\*

So much has recently appeared in the press concerning the value of radium in the treatment of cancer that your committee has deemed it advisable to refer briefly to this subject before describing its activities during the past year.

Mr. Charles L. Parsons of the United States Bureau of Mines sums the matter up so well in his article, "Our Radium Resources," published in *Science*, October 31, 1913, that one can scarcely do better than quote him verbatim:

"It is to be greatly regretted that, owing to the high price of the material, only three or four American surgeons have, so far as the Bureau of Mines is informed, been able to use it in quantities sufficient for the drawing of decisive conclusions. In the progress of the future applications of radium to the curing of disease, nothing is more to be feared than its use in nostrums of every kind. The "wonders of radium" have been so extensively exploited in the public press that already the name is being employed as a psychological agent in advertisements of all kinds of materials, many of which contain no radium at all, or, if this element is indeed present, in such small quantities that no therapeutic value can be expected. As bearing on the need of further experiment, attention is called to the fact that the concentrated action of large quantities of radium may effect cures that have been impossible with the smaller amounts heretofore available to the medical profession. It is doubtful if there is at the present time in the hands of the medical profession of America more than a single gram of this rare element, and the results of investigations soon to be published will show that the concentrated action of the gamma rays from several hundred milligrams arrest certain forms of cancer and other malignant growths, when smaller quantities are without beneficial effect. It is highly important that the medical profession should also have some guarantee of the material they purchase, even if it is purchased in small quantities, and I am glad to note that the United States Bureau of Standards is preparing to standardize radium preparations."

From what Mr. Parsons says it is clearly evident that the supply of radium in this country is as yet very limited and that only three or four surgeons in the United States have had sufficient

quantities of radium to enable them to satisfactorily test the efficacy of this mineral in the treatment of cancer.

In the hands of these surgeons the immediate effects on the cancer have in some instances been wonderful, the growth literally melting away in a few days. Some of these patients, it is true, have later succumbed to the disease, but others up to the present time have remained apparently well. Of course, these patients must be watched for at least one or two years more before it can be definitely stated that they are cured. Only time will tell what percentage of cancer cases can be cured with radium. In the meantime the surgeons engaged in the study of radium strongly advise the employment of surgical means in all cases of cancer in which operation offers a satisfactory chance for a permanent cure.

This evening we are to hear from Professor Gauss what has been accomplished with mesothorium in the Freiburg Clinic.

At the New York meeting of this Congress held one year ago it was clearly demonstrated that the laity had a very hazy idea of just what cancer is and how it can be most successfully combated.

The following facts were emphasized: During the last decade several earnest cancer campaigns had been waged. The main object of these had been to point out to the family physician what might be accomplished by early operation and to urge him to send his patients to the surgeon at the earliest possible moment. Notwithstanding the splendid efforts in this direction little had been accomplished, not because the physicians were necessarily negligent, but because the patients did not present themselves to the physician until the disease was far advanced. Hence it was finally realized that if satisfactory results were to be accomplished the message must be carried directly to the people. It was pointed out that fifteen or twenty years ago it was very difficult to prevail upon persons with appendicitis to be operated upon; now with the knowledge they have, after appendicitis has been diagnosed, operation is sought at once, and the only question asked by the patient or his relatives is, "To what hospital shall I go?" Similarly, as soon as the laity are made fully aware of the cancer situation,

\*Read before the Clinical Congress of Surgeons, Chicago, November, 1913.

they will on the first sign of the disease present themselves for examination and will gladly avail themselves of surgical aid.

The Clinical Congress, fully realizing the necessity for immediate action, gave the subject most careful consideration, and mainly through the efforts of its secretary, Dr. Franklin H. Martin, a Committee consisting of Dr. E. C. Dudley of Chicago, Dr. C. Jeff Miller of New Orleans, Dr. F. F. Simpson of Pittsburgh, Dr. H. C. Taylor of New York, and the speaker, were appointed.

The Committee was instructed to write, or have written, articles on the subject of cancer, and were further instructed to have these published in the daily press and weekly or monthly magazines as might be deemed most expedient. Your Committee has proceeded cautiously, and through the aid of that master organizer and medical editor, George H. Simmons, was able to enlist the co-operation and support of some of the most representative magazines in the country. Mr. Bok, editor, and Mr. Harriman, managing editor, of the *Ladies' Home Journal*, manifested the deepest interest in the campaign. After much thought they came to the conclusion that a lay writer could better reach the public ear, and they naturally selected Mr. Samuel Hopkins Adams, who has proved himself such a dominant factor in the campaign against patent medicines, and who, in June of this year, was made an associate member of the American Medical Association in recognition of his splendid crusade. Mr. Adams, after visiting various surgical clinics throughout the country, wrote a most comprehensive article on the subject, which was first published in the *Ladies' Home Journal* for May, 1913. It is well worth a thorough perusal, not only by every layman, but also by each member of the medical profession.

*Collier's Weekly* for April 26, 1913, and the May number of *McClure's Magazine* also contained admirable articles on the same subject from Mr. Adams' pen. The medical profession is under a deep debt of gratitude to Mr. Bok, Mr. Harriman, Mr. Collier and Mr. McClure for so freely opening their pages for the enlightenment of the public on this very important subject.

It has been estimated that these three articles reached a reading public of between eight and ten millions. *Harper's Weekly*, for March 29th, also contained a timely article urging cancer patients to be operated upon without delay. Abstracts from the magazine articles appeared in many of the daily papers throughout the country. The *Baltimore Sun* contained a full column, the *Baltimore News* and the *Baltimore American*

each devoted ample space to the subject. The *New Orleans News-Item* gave a full abstract of Mr. Adams' article from *McClure's* and the *Detroit News Tribune* for Sunday, April 27, 1913, with the permission of the *Ladies' Home Journal*, copied Mr. Adams' article in full. I have just mentioned a few of the daily papers that have given this matter wide publicity. The entire press of the country has been most liberal in its dissemination of our knowledge of cancer. Nor was this support confined to the papers of the United States. The Canadian journals have also strongly emphasized the necessity that sufferers from cancer should have the condition attended to promptly. I have splendid clippings from the daily press of London, Toronto, Montreal, St. John, N. B., Winnipeg and Vancouver.

Our Committee wishes to express its deep sense of appreciation of the hearty support given it by the press in the dissemination of this knowledge, and feels confident that the press will gladly continue to publish any new data on the subject, until everyone on the continent has a clear idea of just what cancer is, what its early symptoms are, and how it can best be treated.

Our Committee was particularly anxious to find out what influence Mr. Adams' article had had on the community at large and it was not long before data were forthcoming. Within a week after the appearance of Mr. Adams' publication a colleague of mine told me that he had just operated upon a patient for cancer of the breast. The nodule was not larger than a pea; and when asked why she had come so early the patient said she had just read the article in the *Ladies' Home Journal* and felt that it was unwise for her to delay. The outlook in this case is excellent. Another colleague had for weeks been urging a patient with cancer to be operated on, but to no purpose. Within three days after the appearance of the article, which she had carefully read, she entered the hospital and was operated upon. Dr. C. Jeff Miller of New Orleans, one of our Committee, wrote me that as a result of the article in the *Ladies' Home Journal* a lady soon came to him with an early cancer. Dr. T. C. Kennedy of Indianapolis, under date of May 13, 1913, writes: "A lady out in the state noticed a lump in the left breast. Seeing the article in the *Ladies' Home Journal* she immediately consulted her family physician, who referred the case to me. I operated on her at St. Vincent's Hospital last Thursday, doing a Halsted. Here is a case that has a good chance of getting entirely well, as it was taken early."

Dr. Franklin H. Martin of Chicago early in

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May of this year saw a beginning carcinoma of the breast. The husband had just read the article in the *Ladies' Home Journal*, and insisted on his wife consulting a surgeon. Dr. Martin removed the entire breast and axillary glands, and feels sure that the outlook for a permanent cure is excellent.

It is evident, then, that the knowledge of cancer has already been widely disseminated and it is bound to bear fruit. The more the subject is investigated, the clearer it becomes that if the women of the country are made aware of what can be done if cancer patients apply early for treatment, it will be unnecessary to pay much attention to the men. If men are sick, unless very ill, they pay no attention to it, and only after they are urged by their mothers, wives, sisters or daughters, do they seek medical aid. As a matter of fact the woman is the health guardian of the household.

The campaign of education has, however, in reality, just begun. It will be necessary to enlighten every member of the community. The problem is a complex one—one that cannot be handled in the same manner that tuberculosis has been. The subject of tuberculosis is easy of explanation. The disease not only affects the individual, but is a real danger to those in the vicinity, consequently those in the neighborhood are continually on their guard, and if the patient be not careful in the mode of handling his sputum this laxity is soon brought to his or her attention by those in danger.

Cancer, on the other hand, affects chiefly the patient and is of little danger to those around. There is no danger signal such as a cough to draw attention to the malady. Of course, if the cancer be on the hand or face it may be noted by others, but as a rule it is hidden, and the patient only is aware of its presence, and her friends do not for a moment suspect the true condition until the patient appeals for medical treatment, or, as is too often the case, drifts along until the sallow, cachectic appearance accompanying the late stages of the disease clearly demonstrates that the individual is suffering from some dangerous affection.

Much can be accomplished through carefully written and authoritative articles in the daily press and in magazines; but this will not be enough; the symptoms of each and every form of cancer must be indelibly impressed upon every individual. For women such information can be most satisfactorily disseminated by women's clubs. These clubs have been rendering yeoman service to the country, and their real

worth is only now receiving its due share of appreciation. The men of the community can be best reached through short lectures delivered in factories or in the clubs that they may be affiliated with. This heart-to-heart discussion on the subject before small companies of men and women is bound to yield results. If such an enlightenment is to be accomplished the entire medical profession must take an active part in the dissemination of this knowledge.

In some cities the people are waking up to the fact that the public school buildings are at most used only about thirty-five hours a week. They furthermore appreciate the fact that if the maximum amount of good is to be accomplished there must be concerted action. In wideawake communities the schoolhouse has become the evening meeting place of the neighborhood. Here health talks and lectures on hygiene are given and many other topics relating to the welfare of the community are discussed. This practical utilization of the public school building will undoubtedly soon be adopted in all parts of the country and this avenue for the dissemination of the knowledge concerning cancer will then probably be the most important one.

The Clinical Congress entrusted our Committee with the initiation of this campaign. Your Committee finds that accurate data on cancer in the United States are very meager. If the people of the land are to be enlightened, we must keep better records.

The campaign entails added responsibility on the Clinical Congress of Surgeons of North America. With the increased number of cancer patients seeking surgical aid will come a large number of border-line cases—cases in which a careful microscopical examination of the growth must be undertaken to determine whether it is cancer or not. If the growth be malignant, operation is indicated at once. How many surgical clinics throughout the United States are prepared to make frozen sections at once and have at their command an expert surgical pathologist whose opinion can be obtained on the spot? Outside the main centers few possess these facilities, and in many of the hospitals it is days before an expert opinion can be obtained.

Among the many good surgeons throughout the country naturally only a few are surgical pathologists. The time is speedily coming when every hospital will have a trained expert surgical pathologist on its staff, a man whose advice can be had at every operation. He will prove to be one of the hospital's most valuable assets. Some may ask why we have not more such men.

The truth is that the young physician must make a livelihood and as the pathologist receives, as a rule, a mere pittance for his work, few have the scientific perseverance to enter this field. If the work was made satisfactorily remunerative plenty of capable men could be induced to enter this field; and when they have once learned what a fascination there is in following an individual case to its very rock bottom, in obtaining here and there a clue enabling them to forecast with a degree of definiteness and precision whether this or that patient will recover, and in discovering every now and then something that has never before been known to medical men, the majority of these men will never give up the study of surgical pathology. But it is only fair that these pathologists should be well paid. They are really the judges that pass sentence upon this or that patient. It is they who determine for the surgeon whether a radical operation is necessary or not. It is the duty of this Congress to see that in the near future every hospital has a well trained surgical pathologist attached to its staff. Otherwise much of the value of your cancer campaign will be lost.

Your Committee wishes to draw attention to the absolute necessity in every case of cancer of a thorough operation. To accomplish the maximum amount of good for the increased number that will come for operation as a result of our labors, our surgeons must be thoroughly conversant with the anatomy of the parts concerned and must have a full knowledge of the paths along which the cancer travels from its point of origin. In cancer of the lip, for example, the operator must consider the removal of the glands of the neck. In cancer of the breast he must be familiar with the lymph glands that are first involved; in cancer of the rectum he must remember that the liver is frequently secondarily invaded, and that if such be the case, an extensive rectal operation is contra-indicated.

On one occasion, while in Europe, meeting one of my Baltimore colleagues on the street, I said, "Why, I thought you were going to Dr. ———'s clinic this morning." The reply was, "I did. He was to do a breast operation at 8.45; I arrived at 9, and the operation was over." This surgeon has a world-wide reputation. If our work is to be as superficial and incomplete as it was in this case, then it were better not to undertake any campaign against cancer. Fortunately for our patients, admirable work is being done in many clinics, but there are still exceptions.

**AFTER-RESULTS.** Hospital management in years past has been notoriously lax, but in recent

times business methods have been introduced into many of the newer institutions. It would do all medical men good to visit up-to-date business houses and see the card-index systems and the various short-cut methods employed in everyday business. It would also be advisable for the trustees of the various hospitals to see to it that the same systematic and business-like methods are used in the registration of data in the hospitals with which they are connected as they themselves employ in their businesses.

This is an age of time-saving devices and all business men are keen to see what results have accrued from their endeavors along these lines. What applies to business applies equally well to the subject of cancer. What is the use of operating year after year in a routine manner, having but a hazy idea of the final outcome. At least one tactful clerk in every hospital should be assigned to the task of keeping in constant contact with patients who have been operated on. In this manner one can at a glance tell how many patients have been relieved by operation. The results of one operator can be compared with those of another—of course in a fraternal and not hypercritical spirit; for there is no doubt that a runner can always make better progress with a pacemaker. The careful analysis of a large number of cases will always demonstrate wherein future improvements can be made, moreover this strong evidence of the hospital's interest in their welfare cannot fail to impress its former patients, and will stimulate them to urge their fellow-sufferers to undergo a similar treatment.

These data, to be of use, must from time to time be thoroughly analyzed and published. Follow up all your cancer patients, and see what has become of them. Many of them will be dead, but some that you have lost track of are still living and well. You will soon become so interested in the return letters that you can hardly wait for the postman to arrive, and when now and then a reply says that the patient is alive and well at the end of ten or thirteen years, it will warm the cockles of your heart, it will more than outweigh many of the disappointing results you have had and will make you feel that, after all, the fight is well worth keeping up.

With the increased number of cancer patients coming early for operation the percentage of cures will naturally be increased and with the improved methods of operating this percentage will be still further improved. It is this continual increase in the number of permanent cures that we must keep continually before the public.

Many of the smaller hospitals have difficulty

in making ends meet. Such institutions will not be able to furnish funds for the collection of the necessary data on cancer. A cancer fund could not be put to better use than in paying the salaries of capable young physicians who would carefully analyze the cancer results of the smaller institutions. If all statistics could be utilized, in a few years the cancer committee would have an abundant and really valuable amount of information on the subject.

Whether the etiology of cancer will soon be discovered or not is problematical, but in any event the people of the country should be made thoroughly cognizant of the early symptoms of cancer and of the fact that many may be cured by early operation. I can imagine no gift that would yield the philanthropist a greater return than the satisfaction of knowing that as a result of his munificence thousands of lives of cancer patients had been saved by prompt operation.

New workers in an old field are often prone to forget the fundamental labors of pioneers in the same field, and we should be remiss did we not express our appreciation of the labor of those who

in the past have done so much to bring before the general public a judicious amount of knowledge upon the subject of cancer.

In a few words let me give you the message of the Cancer Committee of the Clinical Congress to the people of America:

Cancer is a very common malady.

In the beginning it is a strictly local process and not a blood disease.

It is easily cured when removed early in its course.

It is incurable in its later stages.

It is no respecter of race, creed or social distinction.

It is the common enemy of all mankind.

Earnest thinking people in all walks of life must combine to make a determined fight against this relentless foe.

THOMAS S. CULLEN, M.B., Baltimore, Chairman.

E. C. DUDLEY, M.D., Chicago.

C. JEFF MILLER, M.D., New Orleans.

F. F. SIMPSON, M.D., Pittsburgh.

H. C. TAYLOR, M.D., New York.

Adenomyoma of the Rectovaginal  
Septum

THOMAS S. CULLEN, M.D.  
BALTIMORE

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FIVE HUNDRED AND THIRTY-FIVE NORTH DEARBORN STREET  
CHICAGO

## ADENOMYOMA OF THE RECTOVAGINAL SEPTUM \*

THOMAS S. CULLEN, M.D.  
BALTIMORE

At the meeting of the Canadian Medical Association in June, 1913, I incidentally referred to two cases of this character that had recently come under my care.<sup>1</sup>

This group of cases has in large measure escaped the attention of the surgeon. They are, however, of much interest not only to the pathologist but also to the operator.

Several months ago Dr. D. S. D. Jessup of New York, sent me slides from two pelvic tumors. In each case the tumor had been attached to the cervix posteriorly and had grown into the rectal wall. In each case the growth was so firmly fixed that, while the surgeon was doing a complete abdominal hysterectomy, he was compelled to remove at the same time a piece of the anterior rectal wall, as it was absolutely impossible to separate the uterus from the rectum. The slides that I examined showed non-striated muscle with islands of typical uterine mucosa scattered throughout them. The muscular tissue under the microscope was seen to be intimately blended with the rectal wall, but the rectal mucosa was perfectly normal. The histologic picture in these two cases were identical with those found in adenomyoma of the uterus.<sup>2</sup> An account of the two cases from which the specimens were taken will be published shortly by the surgeon who operated on the patients.

Within forty-eight hours after I sent my report to Dr. Jessup, the February number of the *Proceedings of*

\* From the Gynecological and Pathological departments of the Johns Hopkins Hospital and University.

\* Read before the Southern Surgical and Gynecological Society, Atlanta, Ga., Dec. 16, 1913.

1. Cullen, Thomas S.: Address in Gynecology, Canadian Med. Assn. Jour., August, 1913.

2. Cullen, Thomas S.: Adenomyoma of the Uterus, Philadelphia, W. B. Saunders Company, 1908.

the Royal Society reached me, and in it was a similar case reported in full by Cuthbert Lockyer of London. His description was most lucid and the illustrations left absolutely no doubt that the case was one of adenomyoma of the rectovaginal septum.

#### LOCKYER'S CASES

##### CASE 1.—*Teat-like projection in the vaginal fornix.*

Cuthbert Lockyer<sup>3</sup> at the meeting of the obstetric and gynecologic section of the Royal Society of Medicine, Jan. 2, 1913, before reporting a very interesting case of adenomyoma in the recto-uterin and rectovaginal septum, briefly referred to a case that he had previously seen in which there was a teat-like projection in the right vaginal fornix. This projection was covered over with vaginal mucosa. There was no ulceration and the growth lay close to the cervix on the right side and was long enough to be palpable before the examining finger reached the vaginal cervix. In this case there was no projection into the rectum and no operation had been performed.

##### CASE 2.—*Adenomyoma of the recto-uterine and rectovaginal septa.*

The patient, aged 35, was married but sterile. She complained of vaginal hemorrhage and pain. The periods had always been regular, but for twelve months the loss had been excessive, particularly for the last three months. There was great pain in the rectum, and defecation had become very difficult. The pain had been very severe for the past three months and the patient felt as if "something prevented the bowels from moving." The pain was always worse at night. For several weeks the patient had been bedridden. The hemorrhage for a few weeks previous to her entering the hospital had been practically continuous, but there had never been any bleeding from the bowel.

On vaginal examination a curious hard mass was felt in the posterior vaginal fornix; it was definitely fixed to the supravaginal cervix and adherent to the pelvic floor. The mass was found to project anteriorly into the lumen of the rectum, but the overlying mucous membrane was intact. No definite diagnosis was made.

It was noted that, although the vaginal cervix was normal, the upper part of the posterior vaginal wall for a space of 1½ square inches was puckered and presented bluish-like varicosities.

*Operation.*—When the abdomen was opened the appendages were found to be normal and the uterus small. The rectum and uterus had become fused together below the peritoneal

3. Lockyer, Cuthbert: Proc. Roy. Soc. Med., 1913, vi, No. 4.

reflection so that the two structures could only be moved *en masse* from side to side (Fig. 1). As it was impossible to remove either viscus apart from the other Lockyer proceeded to take the uterus and rectum out together. For this purpose he began as for a Wertheim panhysterectomy by dissecting out the ureters. The left ureter was very intimately adherent to the side of the rectum, to the growth and to the vagina. The right ureter was not adherent. After displacing the ureters and ligating the uterine vessels he carried the dissection anteriorly down as far as possible. The vagina was opened in front and the uterus was now freed from all its connections except where it was adherent to the rectum

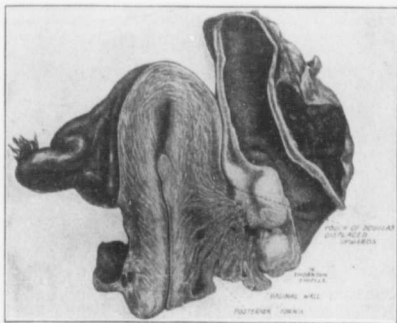


Fig. 1.—Adenomyoma of the rectovaginal septum. A longitudinal section of the uterus and rectum. The posterior wall of the cervix is occupied by a diffuse fibroid growth, which near the cervical canal contains irregular cavities. Posteriorly the growth is intimately blended with a tumor which has implicated the anterior rectal wall and markedly encroached on the lumen of the bowel. The rectal mucosa is still intact. For the histologic picture see Figure 2. (Copied from Cuthbert Lockyer.)

and to the undivided posterior vaginal wall. The rectum was next divided between clamps and the proximal end wrapped up and held aside in the upper angle of the wound. The edges of the vagina were ligated with several interrupted sutures. The edges of the rectum were invaginated and then oversewn. The cellular tissues were tied off and the peritoneum of the pelvis was closed. A small vaginal drain was employed.

The sigmoid or upper free end of the bowel was brought out through a fresh lateral opening in the left iliac region and the

central abdominal wound closed. Two drainage-tubes, however, were inserted down to the closed peritoneal level. The convalescence was disturbed, but the abdominal wound never broke down and the patient at the time of the meeting was sitting up, although still in the hospital.

Lockyer says that microscopically the growth had the structure of an adenomyoma, being made up of dense fibrous and muscular tissue in which were sparsely scattered simple gland tubules surrounded by very cellular tissue similar to that seen around the tubules or follicles of adenomyoma of the uterus (Fig. 2). Histologically, he says, the growth was comparatively benign, but with the naked eye it could be seen that the cervix as well as the anterior wall of the vagina had been definitely invaded by it. There were large hemorrhagic areas

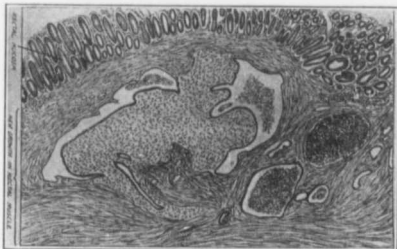


Fig. 2.—Adenomyoma of the rectovaginal septum. For the gross appearance of the tumor see Figure 1. The section includes the rectal mucosa and a portion of the underlying tumor. The rectal mucosa is intact and normal. The tumor lying beneath it consists of non-striated muscle with glands scattered throughout it. Some of these glands lie in direct contact with the muscle and a few of them are dilated. The glandular area in the center of the field has a definite stroma, which is sharply differentiated from the surrounding muscle. It is the characteristic stroma of the uterine mucosa. The tumor is so intimately blended with the rectal wall that no point of cleavage is possible. Consequently the operator would be forced to remove a portion of the rectum, if he attempted a complete excision of the tumor. (Copied from Cuthbert Lockyer.)

which ran down from the center of the growth to the vaginal mucous membrane. The clinical observation that the mucosa of the bowel was intact proved to be correct, the only surface lesion being the puckering of the posterior vaginal wall.

Lockyer suggested that this tissue had developed from remains of the wolffian duct. In discussing the case he said that had he known that the growth was not malignant he would have considered removing a portion of the rectum and closing in the opening, thus avoiding the necessity of making



a permanent colostomy; but he drew attention to the fact that the rectal wall over a large area was firmly fixed and that in all probability it would have been necessary in this case to do a resection.

Two excellent illustrations accompany the communication. The first (Fig 1) shows a longitudinal section of the uterus and the rectum with the growth lying between. The posterior wall of the uterus near the cervix is much thickened and intimately blended with the growth. The rectal mucosa, although puckered, is everywhere intact.

Figure 2 shows a section through the growth and rectal mucosa. The rectal mucous membrane is intact. The underlying growth is in large measure muscular in character. The gland spaces are large and small. Some of the glands lie in direct contact with the muscle, others are separated from it by a definite stroma.

There is absolutely no doubt that Lockyer was dealing with a typical adenomyoma. Its constituent elements were similar to those of adenomyoma of the uterus.

In the discussion of Dr. Lockyer's paper Dr. Macnaughton-Jones briefly referred to a patient aged 66, a nullipara, who had a hard mass occupying the rectovaginal septum. This included the posterior aspect of the vagina with its upper two-thirds and had encroached laterally for some distance. No microscopic examination of this growth had been made, and consequently its exact character could not be determined, although the patient six months after a curettage was in good health and not suffering to any appreciable extent.

Mr. Clifford White in the same discussion said that he had observed two patients suffering from growths in the rectovaginal septum. Both had been admitted to the University College Hospital during the year. Clinically in both cases the tumors were malignant, but sections showed apparently simple adenomatous tissue. There were glands lined with a single layer of epithelium separated from the connective tissue by a definite basement-membrane. No proliferation of the epithelium was present. The connective tissue was fibrous and muscular and contained much lymphoid tissue. The squamous vaginal epithelium was thickened but not epitheliomatous. In neither case was an operation undertaken.

Mr. Herbert Spencer, referring to the cases mentioned by Mr. Clifford White, said that in the first case the

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growth occupied the rectovaginal septum below the posterior lip of the cervix. The tissues around the rectum were infiltrated up to the pelvic wall and the exudate was nodular. He said that microscopic examination showed the growth to be an adenomyoma. As the patient was in good health he proposed to keep her under observation for the present.

My two cases, while somewhat different from those of Jessup and Lockyer, definitely belong to the same group. Case 1 shows a very early stage, whereas Case 2 clearly shows the late stage of the disease.



Fig. 3.—Adenomyoma of the rectovaginal septum. Gyn. Path. No. 16079. A diagrammatic representation of the condition found at operation. The uterus contains several small subperitoneal and interstitial myomas. The cervix posteriorly is adherent to the rectum. Occupying the rectovaginal septum is an oval myomatous nodule, which projects into and narrows the lumen of the bowel. The overlying rectal mucosa is intact, but was the seat of several small rectal polypi. At operation the ureters were isolated and the uterus was then removed. The myoma in the rectovaginal septum, although intimately adherent to one ureter, was removed without injury to the ureter or to the rectum. For the histologic picture of the nodule in the rectovaginal septum see Fig. 4.

#### AUTHOR'S CASES

CASE 1.—*Myomas of the uterus, adenomyoma between the cervix and rectum and associated with rectal adhesions.*

Mrs. G. P. E., seen in consultation with Dr. Samuel T. Earle, March 17, 1911, had several small polypi in the rectum. The uterus lay back on the bowel and was apparently adherent.

*Operation.*—March 22, Dr. Earle burned away five or six rectal polypi which were situated directly behind the cervix. Microscopic examination of the growths showed that they had been undergoing definite inflammatory changes, as evidenced by the quantities of polymorphonuclear leukocytes on their surface and by the fact that the underlying stroma contained great quantities of small round cells.

After Dr. Earle had removed the polypi, I opened the abdomen. The rectum was adherent to the posterior surface of the uterus low down. On the left side was a corpus luteum cyst. This had evidently ruptured at some previous time, as the surrounding tissues were stained dark brown. I did a complete hysterectomy, removing the uterus and appendages, and then shelled out a myoma, 1 cm. in diameter,

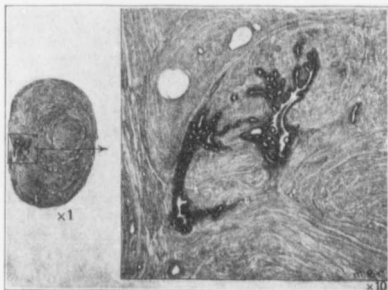


Fig. 4.—Adenomyoma of the rectovaginal septum. Gyn-Path. No. 16079. For the gross appearances see Figure 3. The point from which the drawing was made is indicated in the small sketch on the left. The greater portion of the tumor consisted of myomatous tissue. A glance at the islands of mucosa is sufficient to establish the fact that they consist of typical uterine mucosa. The glands resemble ordinary uterine glands and are surrounded by the characteristic stroma. The picture is identical with that noted in adenomyoma of the uterus.

from the left side of the pelvic floor and another, about 4 cm. in diameter, with a secondary nodule, 1 cm. in diameter, lying on its surface. This combined nodule was situated between the rectum and vagina on the left (Fig. 3).

Oct. 12, 1911, the patient returned to me with signs of definite renal trouble. The roentgenogram showed a stone in the pelvis of each kidney. As the left kidney had apparently given more trouble than the right I removed the stone from the pelvis of that kidney. The patient improved markedly,

but from time to time she experienced some pain in the right renal region.

Nov. 19, 1913, I removed a stone from the pelvis of the right kidney. The patient at present is in excellent condition.

Pathologic Report No. 16079: The uterus itself is only slightly enlarged. Scattered over the surface of the organ are several small fibroids. On microscopic examination the endometrium shows a definite endometritis.

The larger nodule lying between the cervix and rectum is 4 by 3 by 2 cm. and the smaller one 1 cm. in diameter. The larger nodule on histologic examination consists in the main of typical myomatous tissue, but at one point in a cleft (Fig. 4) are islands of typical uterine mucosa and at another point is a miniature uterine cavity. One of the smaller nodules contains one or two gland-like spaces.

From the history it will be noted that in this case the cervix was adherent to the rectum. We have here a connecting link between the ordinary adenomyoma of the uterus and an adenomyoma involving the rectum. It is the only case that I have ever seen showing just this stage.

CASE 2.—*Adenomyoma in the left broad ligament intimately blended with the rectum.*

Mrs. G. S., referred to me by Dr. E. C. Taliaferro of Norfolk, Va., was admitted to the Johns Hopkins Hospital June 4, 1913. This patient was 37 years of age and two years before had been operated on in San Francisco, a myomatous uterus and enlarged ovaries being removed. At that time it was necessary to remove a small portion of the rectum also on account of dense adhesions. She had a stormy convalescence and shortly after the operation developed intestinal obstruction.

After leaving the hospital she had had a great deal of pain in the lower abdomen and for months had had almost continuous bleeding from the cervix. On admission I found a thickening behind the cervix and induration in both broad ligaments. Although the patient was much weakened from the continuous loss of blood we felt that something must be done. The cervix was dilated and on curetting we brought away what on microscopic examination proved to be perfectly normal uterine mucosa. The supravaginal hysterectomy had evidently been a high one.

The right broad ligament was indurated and board-like and on the left side there was also thickening.

An attempt was made to build the patient up, but she continued to lose a great deal of blood and showed absolutely no improvement. A few days later we felt that it was imperative to explore the abdomen. When the operation was begun

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the pulse was 145. We found the rectum densely adherent to the bladder and the left broad ligament was filled with a somewhat cystic mass. Those assisting at the operation thought we were dealing with a malignant growth, which had spread into both broad ligaments. In order to determine definitely I cut the left round ligament, separated the folds of the broad ligament, and found we were dealing with a cystic mass 6 cm. in diameter (Fig. 5). This was gradually shelled out from its attachment to the pelvic wall, but by the time this had been accomplished the patient's pulse had become almost imperceptible, the rate being from 180 to 190.

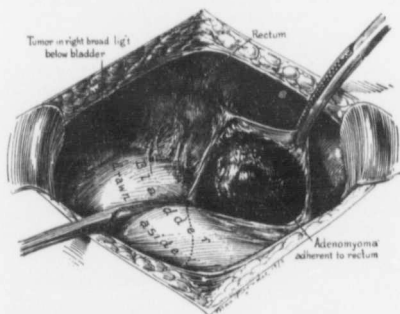


Fig. 5.—Adenomyoma of the broad ligament densely adherent to the rectum. A diagrammatic representation of the appearance of the pelvis at operation. As noted in the history, the uterus and appendages had been removed several years before. The bladder was densely adherent to the rectum. When the left broad ligament was opened up, a cystic mass was encountered, which was adherent to the pelvic wall and blended with the rectum. Its walls consisted of muscle and in its center was a cavity about 2.5 cm. in diameter, lined with a brownish-tinged membrane. The cavity contained chocolate-colored blood. Fig. 6 gives the histologic picture of the walls of this tumor. The right broad ligament also contained a firm mass probably similar in origin, but the condition of the patient did not warrant its exploration.

although she had lost practically no blood. We removed the greater part of the growth, but left a portion still attached to the rectum and did not dare explore the right broad ligament. A drain was introduced into the pelvis and brought out through the lower angle of the incision. When the cystic mass that was attached to the rectum was cut across we found that it contained one large irregular cavity about 2.5

cm. in diameter. This contained chocolate-colored fluid and was lined with a rather smooth-looking membrane which had a brownish tinge. The outer coats of the tumor looked like ordinary muscle.

On microscopic examination it was found that the wall of the blood-stained cyst was lined with one layer of cylindrical epithelium and that this rested on a definite stroma consisting of cells with oval vesicular nuclei. The more solid portions of the growth were made up of non-striated muscle fibers arranged in whorls and of quantities of uterine glands embedded in their characteristic stroma (Fig. 6). In some places only two or three glands with the surrounding stroma were visible, but at other points miniature uterine cavities were found.

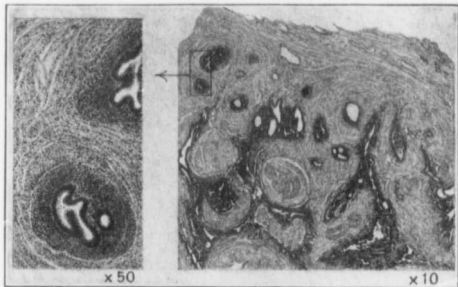


Fig. 6.—Adenomyoma in the left broad ligament. This section is from the tumor occupying the left broad ligament in Figure 5. The tumor consists of myomatous tissue everywhere traversed by typical uterine mucosa. The glands are surrounded by the characteristic stroma of the mucosa, which is sharply differentiated from the surrounding muscle. Some are dilated. A few of the outlying ones lie in direct contact with the muscle. The small area indicated by the arrow has been enlarged. Here we see that the glands are lined with one layer of cylindrical epithelium and that their surrounding stroma stands out in sharp contrast to the muscle.

In this case we were dealing with an adenomyoma, which had become densely adherent to the rectum. It was hoped that we might at a later date explore the right broad ligament remove the cervix and then a portion of the rectum with which the growth was intimately blended. The patient, however, gradually became weaker and died, June 19, 1913.

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Adenomyoma of the uterus is now a well-recognized pathologic lesion and in many cases can be diagnosed clinically. That it is not rare is evident from the fact that I was able to report over seventy cases from the gynecologic clinic of the Johns Hopkins Hospital. It was clearly shown that in the majority of the cases the glands of the adenomyoma came from the uterine mucosa. It was further pointed out that portions of the growth might be carried into the uterine cavity, forming submucous adenomyomas, and that in other cases portions of the adenomyoma were carried outward, forming subperitoneal adenomyomas, and that these subperitoneal growths, when released from the compressing influence of the uterine wall, sometimes become cystic, the cyst fluid being chocolate-colored—an accumulation of old menstrual blood. It was also demonstrated that an adenomyomatous uterus tends to become adherent to the surrounding structures.

I have reported elsewhere instances of adenomyoma of the round ligament<sup>4</sup> and tumors of the umbilicus consisting of adenomyomas.<sup>5</sup> All of these tumors, no matter where situated, showed the same clinical reaction, namely, swelling up at the menstrual period.

In my group of adenomyomas of the uterus were several of cervical origin. If these grow posteriorly, owing to their inherent tendency to become attached, they will spread out into the rectovaginal septum, and become adherent to the rectum; or the peritoneal surface of the cervix may grow fast to the peritoneal surface of the rectum. In either case the rectum becomes fixed to the cervix.

My Case 1 is probably the earliest stage of such a condition. Lying in the pelvic floor were several myomas, the smaller ones consisting of simple myomatous tissue, the largest one measuring 4 by 3 by 2 cm. (Fig. 3) in diameter and containing a well-developed island of uterine mucosa (Fig. 4). It will be noted that even at this early stage the rectum was adherent to the posterior surface of the cervix. It was, however, possible to remove the uterus without injury to the bowel.

4. Cullen, Thomas S.: Adenomyoma of the Round Ligament, Bull. Johns Hopkins Hosp., 1896, Nos. 62 and 63.

5. Cullen, Thomas S.: Surgical Diseases of the Umbilicus, THE JOURNAL A. M. A., Feb. 11, 1911, p. 391.

In Jessup's two cases the growth was so intimately blended with the rectum that in each it was necessary to remove a piece of the rectum with the uterus.

Lockyer's case represents a still further development of the adenomyoma. Such a wide area of the bowel was adherent that it was necessary to remove a complete segment of the rectum and to make a permanent colostomy.

In my Case 2, when the abdomen was opened, in San Francisco, the operator had found it necessary to remove a piece of the rectal wall with the adherent myomatous uterus. The patient's recovery was slow and complicated by an intestinal obstruction. When I saw the patient several years after the first operation she had had vaginal bleeding for months and was almost exsanguinated. When all attempts at building her up had failed, and the loss of blood still continued, as a last resort we did an exploratory operation, with the results recorded above. As noted from the history, the operation was necessarily an incomplete one, and hence it was impossible to tell the exact character of the thickening in the right broad ligament, but it was in all probability also adenomyomatous in character.

These cases are naturally of considerable interest to the surgeon. In the first place these growths, of course, are found only in women, and in the second place, histologically, they are not malignant; that is, they do not give rise to metastases. In the early stages, as shown in my Case 1, the growth may be removed without injury to the rectum. When the growth has invaded the rectum to a limited extent it is necessary to remove only a small portion of the anterior wall of the rectum and the defect can be closed, still leaving a bowel of sufficient caliber. When the rectal involvement is extensive, as in Lockyer's Case 2, resection of that portion of the bowel will, as a rule, be necessary.

The immediate differentiation between carcinoma of the bowel and adenomyomas of the rectovaginal septum is all-important to the surgeon. If the uterus contains myomas, the probability that the pelvic growth is an adenomyoma is strengthened. Further, if the growth appears to be muscular in origin this diagnosis is still more probable; if the growth is cystic, the diagnosis of adenomyoma is almost certain.

Cancer of the rectum starts in the mucous membrane, gradually infiltrates the bowel and then extends to the



peritoneum and at a later stage may involve the cervix. Clinically, there is a history of hemorrhage from the bowel. In adenomyoma of the rectovaginal septum, on the other hand, the only rectal symptom is painful defecation, or there are obstructive symptoms. On rectal examination the bowel mucosa may be found puckered but still intact. Thus it is seen that the differential diagnosis is relatively easy.

Adenomyomas of the rectovaginal septum are benign so far as they do not give rise to metastases, and consequently if the entire growth be removed no further trouble need be feared. If portions be left these will continue to grow and will lead to more pelvic adhesions, and finally produce complications that may result in death or permanent invalidism. When cancer of the rectum is present the operation must of necessity be a much more extensive one.

This group of cases still more clearly emphasizes the necessity of a careful microscopic control of all rectal growths, as they might easily pass for rectal carcinomas and the cases be classified as permanent cures of rectal cancer, when the patient in reality never had cancer.

In cases of adenomyoma of the rectovaginal septum the ureters should be carefully isolated and the uterus then removed in its entirety as in the Wertheim operation. As soon as the vagina has been cut across the uterus and rectum are more mobile and can be drawn further up into the wound. The necessary oval or elliptic piece of rectum is now removed with the uterus and the bowel wound closed. The remaining stages of the operation are identical with those of the Wertheim operation and it will be wise to place a delicate protective drain in the pelvis, taking care, however, that it does not come in contact with the suture line in the bowel. The lower end of the drain emerges from the vagina.

When the adenomyoma involves a large part of the lumen of the bowel, it will become necessary to resect a segment of the bowel.

The glands in these growths undoubtedly arise from the uterine mucosa or from remnants of Müller's duct. If they were rectal adenomyomas, the glands would naturally be of the type composing the rectal mucosa.

The report of four cases in the course of a few months seems to indicate that adenomyoma of the rectovaginal

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septum is not rare; and with the more careful examination of all rectal or perirectal growths I feel confident that in the near future many more such cases will be recorded.

In conclusion I want to thank my friend, Mr. Max Brüdel, director of the Department of "Art in Medicine," in the Johns Hopkins Medical School, for the excellent illustrations accompanying this article.

3 West Preston Street.

THE  
CHURCH HOME AND  
INFIRMARY

A HISTORICAL SKETCH



BALTIMORE, MD.

1915



This is the earliest picture of the Church Home and Infirmary that we can find. It appeared about 1838 in an announcement of the Washington Medical College which then occupied this building. The College authorities evidently wished to show the building as it would appear when fully completed. No West wing existed and the four pyramidal towers were never built. A reference to the picture of 1859 shows what in reality existed.

*Kindness of the Maryland Historical Society.*

THE  
CHURCH HOME AND  
INFIRMARY

A HOSPITAL AND HOME MAINTAINED BY THE EPISCOPALIANS OF BALTIMORE AND OF THE STATE OF MARYLAND

BALTIMORE, MD.

1915

NORMAN T. A. MUNDER & CO.  
PRINTERS  
BALTIMORE, MD.

## PREFACE

**T**HIS fragmentary historical account of the Church Home and Infirmary was given at the graduation exercises of the Training School for Nurses held on Tuesday evening, May 13, 1913. The data contained in this short history came almost exclusively from the Annual Reports. The medical and the nursing side have been dealt with somewhat fully. The limited time at my disposal prevented me from adequately considering many other interesting events connected with the history of this institution.

The hospital and home, although supported entirely by the Episcopalians of Baltimore and of the State of Maryland, in addition to giving a permanent home to the aged and infirm of its own faith, has also rendered incalculable service to the sick of the city, and I might say of the country at large.

It will be noted that the Church Home and Infirmary resulted from an amalgamation of the St. Barnabas's Church Home on Bidde Street and of the St. Andrew's Infirmary on High Street, and further that, on the day the Church Home and Infirmary was opened in 1858, sixteen people were brought to it from the Home and twenty patients from the Infirmary. This dual function has been continued throughout the many years.

With the evolution in hospital methods during the last twenty years and the ever increasing realization on the part of the public that, as a rule, a medical or surgical patient has a much better chance of getting well in a hospital than in his or her home, greater demands have been made in all hospitals for more abundant and more adequate accommodations for private patients. Appreciating the situation, Trustees of the Church Home and Infirmary not only improved the private rooms they already had, but in addition added a new building called the Annex. The new and attractive private rooms were soon in great demand and as a result of the increased revenue obtained it has been possible not only to care for more guests on the Home side but also to make their lot a much happier one; moreover,

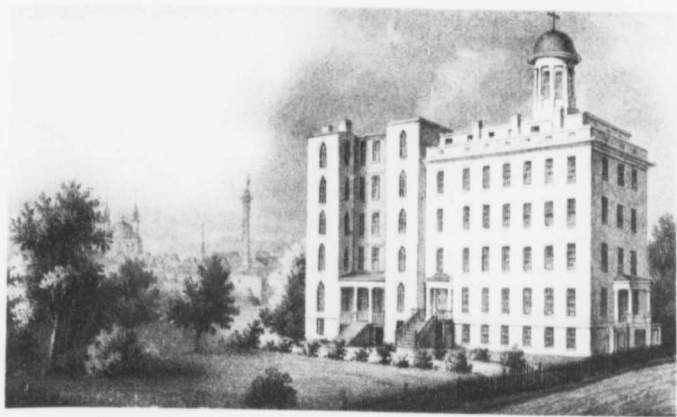
*when one of the permanent guests of the Home now needs medical or surgical treatment, this can be furnished most satisfactorily under the same roof.*

*The Episcopalians of Baltimore and of the State of Maryland have an institution of which they may feel proud, and it must be a source of the greatest satisfaction to them to feel that, while the privilege of residence in the Home must of necessity be limited to members of their own faith, on the Hospital or Infirmary side they are caring for the many irrespective of faith or creed. The Church Home and Infirmary has for over fifty years been doing an incalculable amount of good and its usefulness is continually increasing.*

THOMAS S. CULLEN,

*Chairman of the Medical Committee*





The Church Home and Infirmary in 1859. The West wing had not yet been constructed.  
Washington's monument is seen in the distance.



THE CHURCH HOME AND INFIRMARY IN 1865

This picture was made in commemoration of the monument erected to the memory of Thomas Willey, founder of the Independent Order of Odd Fellows. The Home shows little change. The lawn was then as now a most attractive feature. The George Corner residence is seen in the left of the picture. The costumes then noted on Broadway differed materially from those of today.

*Kindness of the Independent Order of Odd Fellows.*

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## INTRODUCTION

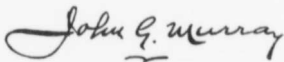
UPON hearing Dr. Cullen's splendid address, herewith published as a historical sketch of the Church Home and Infirmary, I felt its publication for distribution among our people would be most desirable and acceptable.

No one is better qualified to define what such an Institution should be, in its home, no less than in its hospital features, than the author of this sketch.

Nor does anyone occupy a more favorable position than he to state intelligently what this particular Institution really is in every department of its administration, for through many years he has been part of it and has so devoted his time to it, and merged his personality and powers with it, that he knows it as well as does he know himself.

The only thing the Managers of the Church Home and Infirmary have to fear is ignorance of its true purpose and administration; what they supremely desire is that full knowledge of its inner workings, especially on the Home side, shall universally obtain. The address of Dr. Cullen is well calculated to shed proper light upon the Institution and all its affairs from the day of its establishment to the present time.

I appreciate sincerely the kindness of the author in complying with my request for the publication of the sketch, and commend it to the careful consideration of all who may be fortunate enough to have the opportunity of its perusal.



*Bishop of Maryland.*

1110 MADISON AVENUE  
BALTIMORE



**LOOKING WEST FROM THE CHURCH HOME AND INFIRMARY**

This panorama can be seen from the balcony on the Home side and also from the annex. In addition to the several churches and the many tall buildings one recognizes the post-office and that old landmark of Baltimore, the shot-tower.

## THE CHURCH HOME AND INFIRMARY

### A HISTORICAL SKETCH

ALL of you are thoroughly familiar with every nook and cranny of this splendid philanthropic institution, but I venture to say that few in this room have any very clear knowledge of just how it was started or of the departed friends who were responsible for the gradual development of the Church Home.

In the time allotted to me I shall endeavor to give you a short history of your Alma Mater. Most of the information contained in my address has been gleaned from the Annual Reports.

A couple of days ago I called at the office and asked the names of those who had long been associated with the Church Home and Infirmary and who were still in the institution. I was informed that none of the present occupants had been residents of the Home for more than fifteen years. This came as a distinct shock to me as I have been coming to the Home for over fifteen years and I could hardly realize that I was the oldest inhabitant. A more careful examination of the roster, however, showed that several have been in the Home for a much longer period.

Early in the fifties the Episcopal Church in Baltimore was stimulated to start philanthropies looking to the welfare of the sick and homeless. St. Andrew's Church had an infirmary on High Street and several of the other churches supported a Church Home on Biddle Street. The Church Home on Biddle Street had as its officers:-Visitor, Rt. Rev. W. R. Whittingham, D.D. Bishop of Maryland; Rector, Rev. Edmund B. Tuttle; President, Mrs. Whittingham; Vice-President, Mrs. Neilson; Treasurer, Mrs. Montell; Secretary, Miss Barney.

In addition there were four managers from each of the fol-

lowing churches, St. Paul's, Grace, Mt. Calvary and Emmanuel. The matron to the institution was Mrs. Tuttle, and the attending physicians were Dr. F. Donaldson and Dr. R. Atkinson.

In the report of the Trustees of the Church Home on St. Barnabas Day, June 11, 1856 we note that on the 11th of October, 1855, "They called together by public notice the contributors to the Fund, they reporting progress and recommending the immediate organization of the Home, under the joint management and direction of the Rector or Warden thereof, and of a committee of ladies from such of the congregations of the Protestant Episcopal Church in the city of Baltimore as might associate themselves for that purpose. Their recommendation was adopted by the meeting, and shortly after carried into effect by the formation of Church Home Societies in St. Paul's, Grace and Mt. Calvary Churches, and at a subsequent period in Emmanuel Church. The following Resolutions were likewise adopted by the contributors.

"Resolved, that the Trustees, heretofore charged with the collection of a fund for the Church Home, are hereby appointed to continue their work, and to manage and enlarge the Fund. Resolved, that they have power to add to their number from among the Clergy and Laity of the Church; and that they are authorized to fill vacancies occurring in their body. Resolved, that they are also empowered to take out a Charter of Incorporation, which will enable them to hold property and receive bequests, on behalf of the Fund.'

"The Trustees fully believe, and would urge it upon the attention of this meeting, that the present is a suitable time for the more earnest—they hope successful—prosecution and completion of this charitable work. It has survived its initial stage; it has given an earnest of what it can accomplish; it has brought out into bolder relief the wants and claims of the class it aims to benefit. To go back, to fail, would be a shame to our communion. To remain stationary, would be to reject and throw back to poverty and suffering many whose eyes are turned to this charity as their only relief. We must go on, by God's grace and the generous hearts of Christian men.

"We must throw ourselves upon the charities of members



**LOOKING NORTH FROM THE CHURCH HOME AND INFIRMARY**

The tops of the trees on Broadway give a most restful outlook for the convalescent patients lying or sitting on the balconies. In the right of the picture one sees that splendid group of buildings comprising the Johns Hopkins Hospital, which is but three squares distant.

of the Protestant Episcopal Church and beg them, in Christ's Name, to keep alive and render operative an institution, peculiarly of their own body, for the relief of the suffering of those of the same Household of Faith. New York found no difficulty in raising one hundred thousand dollars for St. Luke's Hospital—and is in the field for as much more and will get it. Philadelphia has a large hospital and infirmary well sustained. Chicago, a city of yesterday, has gone beyond us in this respect. Why should our church community, so large, so wealthy, we may add, so charitable, linger on the threshold of so great a work." The Trustees then asked for \$20,000. This appeal was signed by the Chairman of the Trustees, Rev. W. E. Wyatt.

In the report of 1856 it was said, "The number of persons who have thus far received benefits of the institution is as follows:

36 inmates of the Home for divers periods  
98 to whom temporary shelter and meals have been  
afforded."

This was, of course, at the Biddle Street Church Home. "The lodging department, for wayfaring men in the season of winter, is an incidental and distinct feature of the charity, which may, or may not, be connected with the Home. The basement was fitted up for this purpose, having no connection with other parts of the building, or its inmates.

"In short the Home is a place where, if need be, the aged clergyman, worn out and enfeebled in his Master's service, can find a suitable place to which he can retire and prepare his soul for eternity.

"The sick child of sin and sorrow, may come here and learn how to die.

"The daughter of misfortune can stop here by the wayside, as it were, and rest awhile, till ready to go on and do battle with the world, which seemed to be all against her.

"The aged, whose sojourn here is but temporary, can find, what they long for, within its walls—the Old Man's Home.

"The Home is greatly indebted to its friends for donations in money, furniture, etc. Drs. Donaldson and Atkinson have



given their services regularly and faithfully without any charge to the Institution."

At the celebration of the Feast of St. Barnabas, in 1856, the Rev. A. Cleveland Coxe, Rector of Grace Church, preached a sermon in behalf of the Church Home, taking as his text, "Take care of him, and whatsoever thou spendest more, when I come again I will repay thee."

In the course of his remarks he said, "I et us regard our assembling then, not so much an act of mercy to the poor as of justice to ourselves. True, the outcry of the needy is sounding in our ears; but our necessities are greater than theirs. If we shut our ears, or pass by on the other side, we rob them indeed of the morsel of our bread which is theirs by a holy claim, but at the same time, we are losing the opportunity of feeding our spiritual hunger with the Bread 'which endureth unto Everlasting Life.'

"'Go and do thou likewise,'—that is, go, visit the poor and needy, and so far as you can give them the use of your own blessings; deny yourself for them, as the Samaritan did when he descended from his beast and went on foot that the sick man might ride; and what you cannot do in this way, for the want of time or opportunity do in the same way that he did, when he said, 'Take care of him, and whatsoever thou spendest more I will repay thee.' Here is the original conception of such charities as our Church Home; and Christ has chartered it and made it a part of Christian benevolence, by saying of it—'Go and do thou likewise.' And I beg to ask, how—before its doors were opened last October—how did the Churchmen of Baltimore fulfill this part of Christian duty? Where could they go and do likewise? Modern hotels do not open to the poor nor do landlords accept such charges from those who would bid them take care of them. Neither pence nor pounds would secure what such require in any ordinary inn. I trust I may yet see with my own eyes this name of Church Home set over the gate of some large establishment, reared by the Churchmen of Baltimore, as a becoming tribute to God for His bounties to them, and as an illustration of their ideas of the duty suggested by the words, 'Go and do thou likewise.'



LOOKING SOUTH FROM THE CHURCH HOME AND INFIRMARY

The wide avenue is Broadway. This near the hospital is parked, the many trees and flower beds making it particularly attractive.  
In the distance is a beautiful view of the harbor.



It should occupy some spacious and healthy site, of which we should be permitted to say, that some Son of Consolation, like St. Barnabas, devoted it, as that apostle did his land in Cyprus, to the glory of God and the good of Christ's poor. Who will give the land? It should have large and airy halls, in which should lie a great number of impotent folk, as at the pool of Bethesda. It should have a decent chapel, in which, twice every day, the poor should lift their grateful hands to heaven to crave blessings on their benefactors, and in which, from time to time the Word of God should be preached to them and spiritual meat provided."

Little has been written of St. Andrew's Infirmary on High Street, but in the Report for 1888 we note that of six patients who died during the year one had been in the Church Home thirty years (wanting a few days) having been admitted in February, 1858. The report further goes on to say, "That was we believe one of the first patients received in the Home, (Mrs. Jane Chase) having come into the institution on the 9th of February 1858, that being the day when the present building on Broadway was taken possession of under the management of the Deaconesses of the Diocese of Maryland, who merged in one work of charity, and removed into the building, thirty-six patients, of whom twenty came from St. Andrew's Infirmary, and sixteen from the old Church Home Society." It was, therefore, on this day that the Church Home and Infirmary was opened. From the paper "Church Home and Infirmary, Past and Present," written by Dr. F. D. Gavin, appearing in the report of 1896, we learn that the building purchased was erected in 1836 and was used as a medical college, a department of the old Washington University, since merged into the College of Physicians and Surgeons of this city. The original building included a rotunda flanked by towers, and connecting with a wing extending east about seventy feet. Both rotunda and wings were five stories high, with basement, and extended one hundred feet facing the lawn, and looking toward the south.

The earliest picture of this institution, that I have seen, represented this building situated high on a hill and surrounded

by corn fields. The first report of the Church Home and Infirmary says, "The situation of the Church Home and Infirmary is on the most elevated ground in the city and commands a view of the bay and surrounding country, even superior to that obtained from the top of the monument.

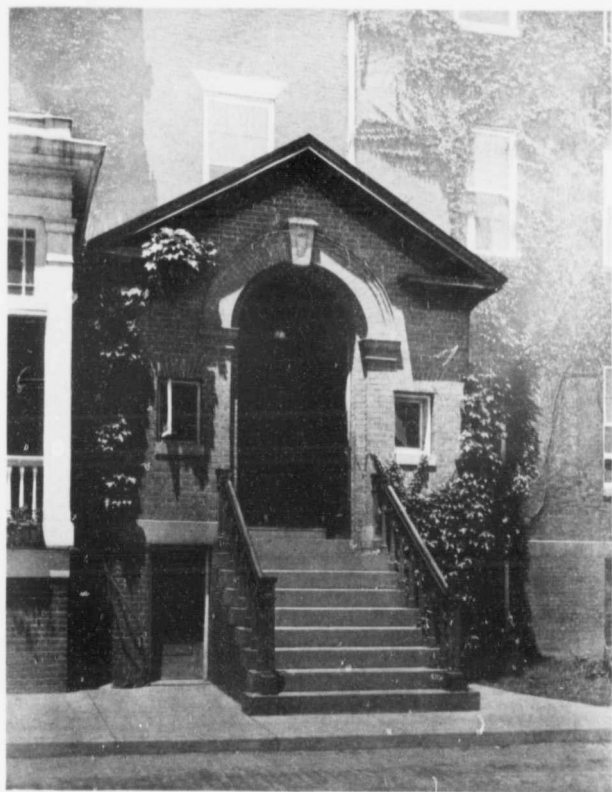
"This eminence—long known from an adjoining site, as Fairmount, is easy of access, and yet removed from the heat and noise of the city. The Avenue, Broadway, on which the building fronts is one of the finest in Baltimore, and although little travelled in this section it is, at a few rods distance, the thoroughfare of a line of Omnibuses, (Pennsylvania Line) which ply through Baltimore Street and the heart of the city to its western extremity.

"As the building now stands it presents a noble aspect. Its cupola is surmounted by the same cross which so long adorned the spire of old St. Paul's, and which, after surviving the fire which consumed that venerable church, now glances in the sun like an ensign on the hill, its wide spreading arms betokening a charity as comprehensive as that of Him who once testified upon the tree his undoubted love for man."

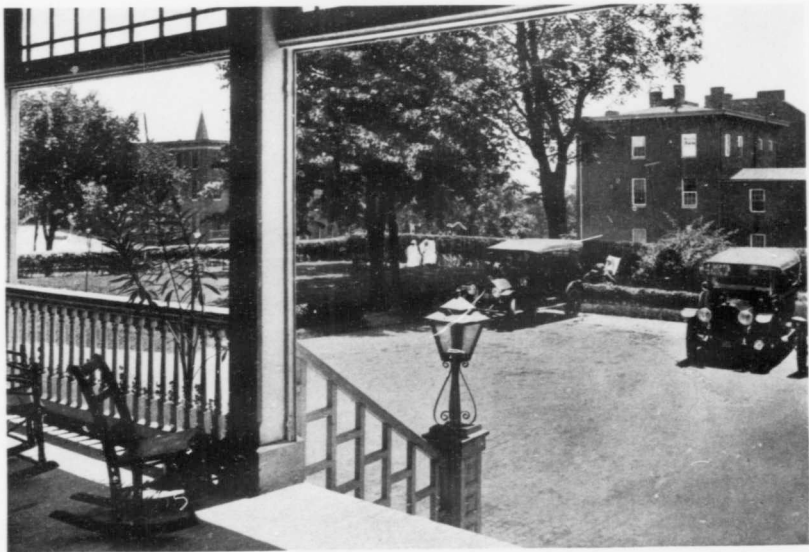
From time to time improvements were made in the institution, the rotunda was fitted up in 1875. In 1883 the Church Home and Infirmary not only owned the building and grounds on which the institution was situated, but had investments amounting to \$115,975 yielding \$4,200 per annum. At that time the women's ward on the 5th floor was an attic room. In 1888 and 1889 it was decided to build the west wing, which was put up at the cost of \$45,864. In this wing provision was made for a sailor's ward situated in the basement and also for a children's ward. The sailor's ward was, however, not a success as no patients came to fill its beds. The children's ward has had many beds and at certain intervals quite a number of children were in the ward but report after report dwells upon the fact that "notwithstanding the many beds few were occupied."

In 1891 the gallery of the chapel was altered so that wheel chairs could be taken in.

In 1893 the East portico of the building was added. In 1896



THE FRONT DOOR LEADING TO THE OFFICE



THE HOSPITAL LAWN AS VIEWED FROM THE VERANDAH

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the Trustees seriously considered the establishing of a Home for Tuberculous patients as by this time the medical profession was urging that the dangers of allowing consumptive patients to be associated with others were great. In 1897 the East wing was repaired and in 1905 the present annex became an accomplished fact.

The Visitor of the Church Home has always been the Bishop of Maryland. Since the building was established the following Bishops have been Visitors, Bishops Whittingham, Pinkney, Paret and our Bishop Murray. The first treasurer of the Church Home and Infirmary was George W. Tinges,\* and in going through the many records I have grown to feel that he was an old friend.

His reports are models. One can see the tremendous amount of interest and anxiety he had for the institution to weather the storm in its early days. One of the most amusing items that I have seen in the report was, "debtor to cash \$2.00 for a counterfeit note." That is the only instance in which I have known the Church Home to have lost money in such a manner. The finances of the institution had many ups and downs, but the Treasurer, assisted by the Trustees and the ladies, was able to cope with the situation. Probably the most pathetic report was that of 1863. "The current year had scarcely opened before a sensible diminution of receipts was felt. The Board had already expended, for debts incurred and for the support of the House, all its funds, including a portion of the endowment and the Treasurer could consequently no longer respond to the calls for money for 'current expenses,' however urgently made. The result has been, 'no money to go to market with' more than once during the past three months, new debts for 'bread and meat' have followed, although it was distinctly understood in July, 1861, that the Board could not keep the institution open, except upon condition that it be kept from debt. The alternatives were Debt, Starvation or the Almshouse. The first was chosen, but of that there must be an end.

\*Mr. George W. Tinges on numerous occasions referred to the gift of the Rev. S. R. Sargeant and on the day that he sent in his resignation as Treasurer to the Board of Trustees in October 1874, he said "On the first of September 1854, I received \$130 from my friend S. R. Sargeant as the beginning of this Society. That was the corner stone."



"The number of beneficiaries has averaged higher than that for which a support was pledged. The cost of support of each has increased. The receipts from pay patients have diminished, and it follows that more, not less, must be paid into the treasury for the present year in order to prevent the second or third alternative above mentioned."

In the report for 1865 by the Warden, the Rev. Mr. Clark, we find the following: "Lastly, we were so unfortunate a few weeks ago as to lose a very fine cow, for which \$100 had just been paid. This is mentioned in the hope that it may meet the eye of some liberal farmer who will replace her."

Mr. C. T. Boehm was appointed Treasurer in 1875 and died in 1893. I can hardly realize that our present Treasurer, Mr. William Thomsen, still a young man, was appointed to his responsible position in 1891, 22 years ago.

Among the list of physicians we notice Drs. F. Donaldson, James A. Reed, W. Chew Van Bibber, W. G. Harrison, Jr., E. Lloyd Howard, Christopher Johnston, George D. Beatty, M. S. De Rossit, Thomas R. Brown, F. R. Walker, B. W. Barton, B. C. Riggs, Russell Murdoch, William Green, H. S. Bowie, Robert W. Johnson, H. P. Wilson, A. E. Stein, L. McLane Tiffany, Howard A. Kelly, and George J. Preston. The first resident physician was Dr. W. C. Worthington, appointed in 1873; the second, Dr. Frank D. Gavin, appointed in 1874.

In the report of the Trustees for the year 1879 we read, "During the past year there have been performed several very interesting surgical operations and in this connection the Trustees would make grateful mention of Dr. Thomas R. Brown, by whose death the Church Home suffers a great loss. Dr. Brown had for several years given his most acceptable services gratuitously, and many are those who by his skill have been relieved. He was always faithful in his duties, thus voluntarily assumed, and kind and gentle to the suffering. His memory will long be dear to those whom, under God, he has restored to health and strength,"

In 1892 the report of the Executive Committee says "That we are able to close the year without materially exceeding our

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income is a matter not only of congratulation, when the increase of patients treated in the surgical and general wards of the Infirmary is noted, but also worthy of commendation. The credit is due, in a very great measure, to our resident physician, F. D. Gavin, M. D., to whose care and foresight the efficiency of the institution at the present time is in a great measure due. Always giving his time and thought to our needs the many years of his oversight are bearing fruit, and his kindness towards the inmates, his fairness of dealing with those among whom he labors, and his cordial welcome given to other physicians and surgeons, whose patients find in him a constant and attentive friend, is appreciated by all. He has seen that which was needed to make the Church Home and Infirmary more useful to the sufferers in our community, and his insistence until the wants have been supplied has enabled the Home to offer to the large number, who have availed themselves of its care, much that has alleviated distress and increased the usefulness of the work that is carried on within its walls."

The report of 1904 contains the appointment of Dr. S. Griffith Davis as assistant physician. Dr. Davis has for many years rendered the institution signal service by giving the anaesthetics; he has become one of the most prominent anaesthetists in the country, and has added greatly to the prestige of the institution.

The first Interne to be appointed was Dr. Maurice Lazenby, who was selected in 1904. In the same year Dr. Gavin was made Superintendent. Mr. S. J. Hough, Secretary of the Executive Committee said "Your committee hopes that this action will meet with the approval of the Board. They feel confident that the appointment of Dr. F. D. Gavin as General Superintendent, from his long continued connection with the Home for a period of thirty years and his intimate acquaintance with its policies and workings, will greatly tend to increase the efficiency of the work of the Home in every respect, and it is but a just tribute for the valuable services heretofore rendered by him."

The committee, consisting of Rev. Dr. J. S. B. Hodges, Samuel J. Hough and Arthur Boehm, in making their report say: "As the work of the Church Home has grown, especially during

the past few years, it has been thought advisable to make some change in the management of the institution, particularly by placing the internal administration of the Home under a single head, who is responsible for the entire management to the Trustees, through the Executive Committee. This has been done; and Dr. Frank D. Gavin, who has since 1874 (full thirty years) been the Resident Physician, has been appointed Superintendent and physician in charge of the Church Home and Infirmary."

In the early days the rates in the public wards were \$3.00 a week and for private patients from \$5.00 to \$12.00. In the beginning the Church Home and Infirmary recognized the necessity of having suitable quarters for pay patients. It was one of the first hospitals in the country to understand that private patients should have at least as good treatment as free patients, and furthermore the Trustees had the business sagacity to see that a certain amount of revenue might be derived from pay patients, thus enabling them to care for more free patients than their finances would otherwise permit them to do.

In one year, in the second report there are records of seven colored people being cared for, this being the maximum. Since then no record of treatment of colored people is forthcoming, which is only natural considering the size and scope of the institution.

In 1879 an eye and ear dispensary was maintained and presided over by Dr. Russell Murdoch. This was kept up for some time, but then closed as Dr. Murdoch could no longer give his time to it. One of the most interesting rules for patients that I have noted in any hospital was contained in the report of 1874 and subsequent reports. "No discontented or dissatisfied inmate will be retained in the house."

### NURSING IN THE INSTITUTION

As noted in the beginning of the report, the Deaconesses from St. Andrew's Infirmary came to the Church Home and to them was entrusted the care of the patients. These nurses served the institution most faithfully and in various reports high tribute is paid to their excellent service. The report of 1863

TO THE MEMORY OF  
EDGAR ALLAN POE  
WHO SPENT HIS LAST DAYS  
IN THIS HOUSE

THE POE TABLET

Edgar Allan Poe breathed his last in the Church Home and Infirmary. In 1909 Mrs. Thomas S. Cullen offered the Trustees a tablet commemorating this fact. The offer was accepted and the tablet occupies a prominent place in the rotunda of the Institution.

mentions the possibility of a training school for nurses. "It is to establish there a training school for nurses, where Christian women, who desire to devote themselves to such a calling may find a home, and gain the experience which is so necessary for its judicious and faithful exercise. This has been already done to a limited extent, but it is the wish of the Trustees to establish this as an integral part of their work. It is believed that such a central home for nurses would be a great blessing to the Home itself; to the women who might be instructed there, and to the community at large, who would thus be supplied with carefully trained and responsible nurses, whose fidelity can be vouched for by the physicians and other officers in the institution."

In 1866 the Chairman said: "The withdrawal of Rev. Mr. Clark subjected the Trustees to no little anxiety lest they should be unable to supply his place; this anxiety was happily removed by the voluntary offer of the Sisterhood of the Good Shepherd to undertake the charge of the Home for three months, at the expiration of which experimental period the Sisters were willing to withdraw, in case the Trustees should prefer to fall back upon the old arrangement."

"As this movement was a very important one, and has already been attended with great advantage to the institution, the Board of Trustees desire to place on record their deep sense of the very valuable services which were rendered in their great emergency by this Association of Christian women. In the hottest part of the past trying summer, the Sisters freely relinquished their usual vacation, went to the Home in sufficient force to take charge of its affairs, gave themselves up not only to the work of nursing, but with their own hands cleansed and purified the building from top to bottom, putting every room and ward in good order, and establishing a degree of neatness, order and economy throughout, which cannot but be gratifying to the friends of the institution.

"At the expiration of the three months, the Board was fully satisfied that the experiment was eminently successful; and that whether regard was to be had to care and tenderness in nursing, to neatness and order in internal arrangement, or to economy

in management, the Sisters were the most efficient and faithful helpers they could possibly secure. They accordingly, on the 12th of November last, adopted a resolution setting forth their appreciation of the services which had been rendered, and requested the Sisterhood to continue their care of the institution. The internal management of the Home and Infirmary is now in their hands, they have the same temporal duties and responsibilities which devolved upon the Warden, and a Chaplain attends to the spiritual duties of the House."

In the annual report of 1871 we note: "They enjoy alike the ministrations of the Sisters, six or eight of whom are in constant attendance without cost to the church, sometimes even without the cheering expression of her people's countenance, by the bedside of the weak and dying."

In 1872 the Sisters of the Good Shepherd left and went to Missouri. The report for 1873 says: "Scarcely had the year begun before the Sisters of the Good Shepherd, who were entrusted with the care of the House which they had served well and long, gave notice to the Trustees of their acceptance of an invitation from the Bishop of Missouri to remove to his Diocese. The loss occasioned by their withdrawal was very seriously felt, and as slowly repaired. They had grown up, as it were, with this child of their nurture and were all that was left of the original Deaconesses of Maryland, then at work in its borders. After weary search and anxious consultation Sister Anne and her associates of what is known as the Sisterhood of St. Luke the Physician were induced to undertake this responsible charge, upon the duties of which they entered at Easter. Of this Order of Christian Women, the Bishop of the Diocese is ecclesiastical head, and its members are subject to his sole direction. Sisters Eliza and Margaret, who were among the first Deaconesses set apart in Maryland, were offered a home for life upon the removal of their Order, which they gladly accepted from the Board of Trustees."

When Sister Anne took charge there were thirty-four inmates, and on the list of pay patients seventeen persons. Sister Anne and her associates resigned in 1873. "She was followed by Miss Mary J. Bradford a lady so well known to the churches

in Baltimore, as to make it unnecessary to say a word more. Miss Bradford had Miss Theodora Gilmore as an invaluable assistant. Sister Margaret and the other assistants remain, Miss Bradford as the Head, with the Executive Committee of the Board as her council of advice, will now conduct the work."

Miss Bradford remained in charge for over fifteen years and died at the Church Home in 1890.

The report for 1890 says: "The Trustees of the Church Home and Infirmary, in laying before its many friends another Annual Report cannot begin that report without the expression of their sense of the great loss the institution and all connected with it have sustained in the death of Miss Bradford, who passed calmly, peacefully away from her earthly labors on the 12th day of last February. For fifteen years, close upon half the entire lifetime of the Church Home and during which period more than one-half of its active work has been accomplished, she gave it her wise, loving and never failing care.

"While, with all who came under her influence, we sorrow for the loss, we should be ungrateful indeed if we were not devoutly thankful for her long and faithful service. And we gladly place upon record our testimony that the loss occasioned by her death has been the less severely felt by reason of the faithful and capable services of her long time fellow-workers, especially Dr. F. D. Gavin and Miss H. M. Sudler, upon whom the Executive Committee at once devolved the immediate responsibility of the work."

In 1892, in the report of the Rev. Dr. J. S. B. Hodges we note that "Several of the City physicians have availed themselves of the invitation issued last year, and a number of operations have been performed by them with most gratifying results. The Operating Room, recently fitted up, has answered its purpose admirably. Every facility is afforded for operating according to the latest requirements of Surgery. Trained nurses have been employed for all cases requiring such special care. Dr. Gavin reports that heretofore the hospital feature of our work has been so small that it furnished little or no material for training. If the work continues to increase at the same rate

as during the past year we shall be able to train nurses for our own use."

The report of the physician in charge for 1897 says: "We have six nurses under the immediate direction of Mrs. Lucas, from whom they receive instruction in all matters concerning their work. They have charge or supervision of all cases requiring their care. Of our nurses I wish to make this statement; that without exception they have discharged the duties committed to them both carefully and cheerfully, and have been painstaking in carrying out instructions, and obliging when taxed beyond the requirements of service. They deserve our appreciation and they should know they have it."

In the report of 1898 Dr. Gavin says: "We have seven nurses, besides Mrs. Lucas, who superintends their work and directs their studies. These nurses have charge of five floors or wards, where the transient patients are most numerous; and the oversight, also of any case that requires especial attention in other parts of the house."

I would just like to emphasize this fact for the benefit of my hearers and I, too, gladly speak most highly of the work of these women. They not only helped in the wards and in the operating room, but also were frequently up all night. At that time it was difficult to get sufficient nurses and the institution was not overly burdened with money, consequently the nurses that worked all day retired in kimonas, each patient had a bell by her side and in case of emergency during the night the bell was rung. The weary nurse would attend to the patient and then retire. Those of us who now think we have a great deal to do have in reality much lighter labors than the nurses of those days.

In the same report Dr. Gavin refers to "one who was engaged in this work from its very beginning, who shared its vicissitudes, and who lived to enjoy the assurance of its success. I refer to Sister Margaret. For thirty-two years she gave all she possessed of bodily strength, excellent judgment and honest, whole-souled endeavor for the advancement of this charity. Late in her life, after ill health and feebleness had made cessation from the chosen labors imperative, she lived on to appre-





THE CHURCH HOME AND INFIRMARY AS IT LOOKS TODAY  
This picture was taken from the corner of Fairmount Avenue and Broadway.

ciate as a blessed resting place this same Home that she had done so much to make a happy one for others. The last eight years of her life were passed in such quiet and contentment as were permitted by her increasing infirmities. She slept peacefully away on Sunday morning, the day after Christmas, in the eighty-sixth year of her age."

The improvement of the Training School for Nurses was a gradual one. After the resignation of Mrs. Lucas we had in succession, Miss Mallalieu, Miss Lucy Sharp, Miss Saunders, Miss A. Miller, Miss Caroline Taylor, Miss Weidman, Miss Nancy P. Ellicott, Miss Mary B. Thompson, Miss Lucy Sharp, Miss Waters, Miss Hartwell, Miss Bennett and Miss V. Bartlett.

On the resignation of Dr. F. D. Gavin in 1908 the following report was made by the President of the Trustees, Rev. Dr. Arthur Chilton Powell. "In recent years under the direction of Dr. Frank D. Gavin, the Infirmary department of our institution has been greatly developed, while the Home feature has not been diminished. Great credit is due him for this development, to which he gave both time and care. It will always be a monument to his long and faithful administration, which terminated by resignation in March last. Dr. Gavin took with him the good will and personal regard of every member of the Board of Trustees when he retired to the private practice of his profession. He had been attached to the Church Home and Infirmary in several capacities for a third of a century, and his name must always be honorably associated with its history.

"In March 1908 the Rev. Dr. J. S. B. Hodges, S.T. D. presented to the Board his resignation as its President, and thus brought to a close a personal service such as our institution has had from no other Trustee. For the past thirty-four years, he had been the faithful President of the Board, and, through his influence added greatly to the strength and popularity of the institution. His resignation was received with much reluctance. He remains, however, a member of the Board of Trustees."

In the report of Rev. Dr. Arthur Chilton Powell published in April 1906, we note, "During the year Miss Sudler, for many years matron of the institution, decided to retire from active ser-

vice, and in appreciation of her long and faithful connection with the Home, a yearly pension was voted her, equal to the salary she had received."

Miss Sudler after severing her active management in the affairs of the Church Home and Infirmary spent several very happy years among her many warm friends in Baltimore and died after a short illness on April 9, 1913.

To those of you who knew Miss Sudler no mention of her splendid qualities is necessary. For those who were not fortunate enough to be associated with her I will say that she was a woman of splendid tact and judgment and that in the ministration of her office her chief aim was to make the lot of the infirm and the aged as comfortable and happy as it could possibly be. Her daily rounds were looked forward to by all, and her final departure will be mourned by the many members of the Church Home and Infirmary family.

For several years after the resignation of Dr. Gavin the Executive Committee, with Mr. Arthur Boehm as active representative, looked after the management of the institution. When he resigned the position, Mr. William Thomsen and Mr. M. K. Burch successfully guided the destinies of the Home.

In the Fall of 1912 the Executive Committee after much careful consideration and investigation was successful in securing the services of Miss Jane Nash, who had successfully managed the Fordham Hospital in New York. In a personal conversation with Dr. Winford H. Smith, Superintendent of the Johns Hopkins Hospital, I asked him who was the best available person for the Superintendency of the Home; he said "One of the two or three in the United States is Miss Nash, but you can't get her." It is a source of great gratification that she is now the Executive officer of the Church Home and Infirmary.

The First Board of Trustees as mentioned in the Second Annual Report published December 1, 1859, consisted of the following gentlemen: Rev. Wm. E. Wyatt, D. D.; Rev. A. Cleveland Cox, D. D.; Rev. Sam'l R. Sargeant; Rev. Geo. D. Cummings, D. D.; Mr. Wm. Woodward; Mr. Matthew Howe; Mr. Geo. W. Tinges; Mr. Sam'l G. Wyman; Mr. Fred. W. Brune, Jr.; Mr. Wm. G. Harrison; Mr. Laurence Thomsen.

Report after report attested to their fidelity to the trust they were so thoroughly interested in. The tribute paid to each of these men as they one by one passed to the Beyond leaves no doubt as to the great part they played in the development of the Institution. I wish time permitted me to briefly sketch the lives of these splendid and representative citizens of Baltimore and of the members of the successive Boards.

The present Board of Trustees is a most active one and on the Executive Committee for 1913 are Rev. Arthur Chilton Powell, D. D., Chairman, *Ex-officio*, Mr. William Thomsen, *Ex-officio*, Mr. Marion K. Burch, Mr. Edward Guest Gibson, Rev. Edwin B. Niver, D. D., Mr. Franklin P. Cator, Mr. John Black, Mr. William W. Chipchase.

At a gathering similar to this and taking place half a century later, and probably in this very rotunda, I feel confident that the speaker when referring to the management of the Church Home and Infirmary for 1913, will say, that the Trustees were broad-minded men, that they were absolutely true to their trust and that they had brought the institution to such a degree of perfection that it was enabled to do the maximum amount of good, and that it was a philanthropy of which the Churchmen of Maryland justly felt proud.

No history of the Home would be complete without a reference to Lizzie, who for so many years, faithfully looked after the meals in the East wing and has long since been promoted to the Nurses' Home.

A ride in the elevator without Mike would seem unnatural, and a visit to the Home without seeing the bald head and beaming countenance of Mr. Marvel would not be complete. I must, however, cease. Time will not permit me to linger with these and many other members of the Institution who year in and year out have labored unostentatiously and faithfully for the welfare of the Home.

I have in as short a space as possible given you some of the history of the Church Home and Infirmary. The City of Baltimore when this institution was started was relatively small as is indicated by the fact that St. Michael's and All Angels was spoken of as in Baltimore County. With the growth of the

city the development of the institution has kept pace.

I will now address a few remarks to you of the graduating class. In a recent address of Sir William Osler to the graduating class of the Johns Hopkins Training School for Nurses he spoke of Tact, Tidiness, Taciturnity, Sympathy, Gentleness, Cheerfulness and Charity. The necessity of each one of these is clearly evident to you. You have doubtless had numerous lectures bearing upon this subject, consequently I will leave nothing with you but the titles.

In recent years it has been more and more evident that every man and woman should have a vocation. In the majority of instances this is necessary for a livelihood, but rich and poor alike must be employed, if they are to satisfactorily fill their individual niche in the community and if they are to get out of life true happiness.

Many are compelled to select vocations or occupations that are not to their liking and that are monotonous. You have chosen a profession that is continually unfolding new and interesting problems,—a profession that brings you into the most intimate contact with nearly every phase of life. In these few years, you have seen the happy and the sad side of life and are able to deduce the proper perspective of what is and what is not really worth while.

You are now ready for graduation, in reality you are just at the threshold. Heretofore you have been under hospital supervision, where if you were not exactly sure what should be done you could always call upon the head nurse or the superintendent for instructions. Henceforth if any emergency arises, between the physician's visits and when he is not available, you will have to use your own initiative. You will now occasionally have to decide promptly just what shall be done and will have to act accordingly. You have in the past been, figuratively speaking, hot-house plants. You are now transferred to your own individual sphere of usefulness.

The medical student, who after graduation thinks that further study is unnecessary, usually vegetates and in the course of a few years is no longer in touch with the advances in medicine. The same is equally true with the nurse. She should

take one or two of the best journals, and when opportunity offers see what new and important methods have been devised. In this way she keeps abreast of the times and her value to the community is greater. Again, this new knowledge is a continual stimulus, and often fosters the spirit of investigation.

Rest. The work of a trained nurse is very strenuous and consequently every nurse should take at least one month's vacation each year. Remember health is one of your greatest assets. In fact, if you are not well, you cannot do justice to yourself or to your patient. If at any time you are run down, take a rest at once. Remember, as a rule, you can accomplish more real work in eleven months than you can in twelve.

Save. Unfortunately neither the nurse nor medical student is given any business instructions during their course. Few nurses can withstand a long series of years of work without taking a prolonged rest and every nurse must reckon with the possibility of sickness. A good business man will lay by a contingent fund. Nurses should do likewise and I cannot too strongly impress upon you the necessity of saving a definite percentage of your earnings to be safely laid by or to be invested by a thoroughly competent business man.

In a hospital with which I was connected years ago, the Superintendent of Nurses made a very curious classification of her former pupils:

1. Nurses on the active list.
2. Nurses on the mortality list.
3. Nurses that were deceased.

Class 2, nurses on the mortality list, consisted of those who had married and had left the nursing profession. No matter what profession you may later enter the training you have already had will always be a most valuable adjunct.

In conclusion I want to congratulate you of the graduating class on having satisfactorily completed your term of service and I sincerely trust that each of you may have a most happy and successful career.

UNUSUAL CASES ILLUSTRATING POINTS IN DIAGNOSIS AND  
TREATMENT

By THOMAS S. CULLEN, M.B., Baltimore

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## UNUSUAL CASES ILLUSTRATING POINTS IN DIAGNOSIS AND TREATMENT<sup>1</sup>

- I. A CALCIFIED LYMPH-GLAND PRODUCING SYMPTOMS SOMEWHAT SUGGESTIVE OF GALL-STONES.
- II. AN OLD AND INFECTED ABDOMINAL PREGNANCY WITH EXTENSION OF THE LONG BONES INTO THE BLADDER AND INTO THE BOWEL.
- III. A FURTHER CASE OF ADENOMYOMA OF THE RECTOVAGINAL SEPTUM.
- IV. OPERATION FOR THE RADICAL CURE OF AN UMBILICAL HERNIA IN A PATIENT WEIGHING 464 POUNDS.
- V. REMOVAL OF A LARGE TUBERCULOUS CYST OF THE MESENTERY OF THE JEJUNUM, TOGETHER WITH THE CORRESPONDING SEGMENT OF BOWEL; RECOVERY; LATER DEATH, APPARENTLY FROM TUBERCULOUS MENINGITIS.

By THOMAS S. CULLEN, M.B., BALTIMORE

### I. A CALCIFIED LYMPH-GLAND PRODUCING SYMPTOMS SOMEWHAT SUGGESTIVE OF GALL STONES

MRS. C. S. was referred by Dr. S. Denny Willson and operated upon at the Church Home and Infirmary on June 9, 1914. In December, 1913, she had had sharp pain in the right lower abdominal quadrant and had been confined to bed for three days. There had been no vomiting at this time. In February, 1914, she had had a second attack and ten days before admission a third. During this last attack there had been vomiting and fever. Her previous history was unimportant save for the fact that there had been a slight tenderness in the right lower quadrant. In other words, the patient gave a definite history of a mild appendicitis and on one occasion there had been a yellowish tinge to the eyes.

Operation: I made a right rectus incision, not being absolutely certain whether the gall-bladder was involved or not. We removed the appendix, which was twice the natural size and contained a concretion. I examined the gall-bladder region and felt what appeared to be a stone. I accordingly lengthened the incision and then saw a stone beneath the junction of the cystic and common ducts (Fig. 1). This was irregular in outline, about 1.5 cm. in diameter and embedded in a little scar-tissue. It was gradually peeled out.

Dr. Paul Wegefarth, who was standing by my side, suggested that we were possibly dealing with a calcified lymph-gland. Both ducts were of normal caliber and free from induration. Neither the common nor the cystic duct was opened. A small drain was carried down to the point of removal of the stone. Examination of the so-called stone tended to show that it was really a calcified lymph-gland.

Dr. Wegefarth examined the stone chemically. With hydrochloric acid and also with nitric acid the stone substance dissolved completely, giving off carbonic acid. The test for bile was negative. A portion of the stone was ground up and then mixed with alcohol and ether. Examination of the residue was made for cholesterolin with negative results.

There is no doubt that this apparent calculus represented an area of calcification. Its size, shape, and situation tend to show that it was a calcified lymph-gland. The chemical examination demonstrated conclusively that it bore no resemblance whatsoever to a gall-stone.

<sup>1</sup> Reported at the meeting of the Southern Surgical and Gynecological Association, Asheville, North Carolina, December 16, 1914.



## II. AN OLD AND INFECTED ABDOMINAL PREGNANCY WITH EXTENSION OF THE LONG BONES INTO THE BLADDER AND INTO THE BOWEL

Gyn. No. 13,866. L. S., aged 53, colored; admitted to the Johns Hopkins Hospital, May 3, 1907; discharged, June 26, 1907. Apart from the fact that the woman had never been strong the early history was unimportant.

The menses began at 13 and were regular. She married at 18. Two years later she had a miscarriage at the third month, and three years later a second at one month. Ten years after marriage she had a child. The labor was instrumental and there was much tearing. She was in bed two months with high fever, and had a great deal of vomiting and abdominal pain. After this the periods became too frequent, coming on practically every two weeks. Since a supposed miscarriage (three years before admission) the menses have occurred at irregular intervals of four to eight weeks; they have been profuse and have lasted from two to three weeks. The last period began April 7, 1907, and persisted for fourteen days.

Present illness. For the last five years the patient has had pain in the right lower abdomen, usually dull in character and occasionally accompanied by nausea. There have been no chills, no fever, and no vomiting. The abdominal discomfort is not present every day. It is aggravated by exertion.

Three years ago the patient was supposed to be pregnant. The periods ceased; there was morning sickness and later the perception of fetal move-

ments. There was colostrum in the breasts and abdominal enlargement. She developed severe abdominal pain which was labor-like in character. This lasted for five minutes and then suddenly ceased, but the patient passed only blood. Immediately after she noticed a hard tender lump in the right lower abdomen. This lump has gradually become smaller, as has also the abdominal enlargement. The patient has not lost in strength. There is no swelling of the feet, but dyspnea has been noted on exertion, and for two months last winter there was a cough and occasionally night sweats. The patient has had a good deal of indigestion but no jaundice. She complains of burning in the urethra, micturition is frequent and scanty and the urine at times is mixed with blood. She has a profuse odorless but irritating vaginal discharge.

On admission to the hospital the patient did not look acutely ill. Her tongue, however, was furred. The pulse was a little rapid but of good volume. The abdomen was distended on the right side by an irregular nodular mass, which on palpation gave a peculiar feeling of crepitus differing from anything that I have ever felt. The mass was irregular but hard, like a myoma. On pelvic examination the cervix was found to be firm, the uterus slightly enlarged and in retroposition. On the right side was a mass which was apparently connected with the body of the uterus. The structures on the left side could not be palpated.

From the history and examination the condition was diagnosed before operation as an abdominal pregnancy. The patient was catheterized when under ether, and a large quantity of thick tenacious urine was obtained. In the bladder the catheter also encountered something which felt very much like a stone.

Operation, May 4, 1907: I made a median abdominal incision. The peritoneum was opened and at once disclosed a large irregular mass in the right lower abdomen, with the omentum densely adherent to it. After the omentum had been doubly ligated and severed, the upper portion was pushed back out of the way and the parts were carefully walled off. The large and small bowel were found to be densely adherent to the sac. The small bowel was dissected away as carefully as possible, but the outer coat was torn about 12 inches above the ileocecal valve. This tear was immediately repaired with a continuous Pagenstecher suture.

On opening the sac I found it contained a large number of fetal bones, as indicated in Fig. 2. After removing the greater number of the bones I attempted to enucleate the sac. The left tube and ovary were now removed and the sac on the right side was gradually loosened up. The bladder was found densely adherent and connected with the extra-uterine mass. After being freed by blunt

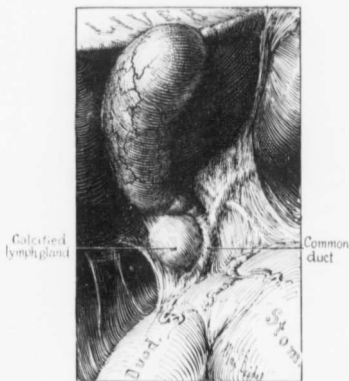


Fig. 1. A calcified lymph gland embedded in adhesions and lying against the cystic and common bile ducts. (Case 1.)



Fig. 2. Fetal bones contained in the abscess sac of an old abdominal pregnancy. These have been roughly placed together. One end of the long bone (at the bottom of the picture) is much thickened. This is due to the fact that it had ulcerated through into the bladder, where it had become encrusted with phosphatic deposits. This bone has been photographed on a larger scale than the others.

dissection, it was noted that one of the long bones projected into the bladder and that the portion within the bladder was covered with a thick de-

posit of urinary salts (Fig. 2). The bladder opening was closed with catgut and with a continuous Pagenstecker suture. The enucleation of the sac was continued until it was delivered from the abdomen. The large bowel was then examined. There were two openings in the caecum, one at the junction of the ileocaecal valve. The vermiform appendix was thickened and indurated. It was situated 2 cm. from this hole in the caecum. The appendix was removed and the hole in the bowel closed in with two continuous Pagenstecker sutures. The second opening in the caecum was 6 cm. from the ileocaecal valve. This was drawn up into the wound and sutured in a similar manner with two continuous Pagenstecker sutures. The holes in the bowel had been made by the ends of the long bones which had ulcerated through and were projecting into the lumen.

A parovarian cyst was also removed from the right side. A cigarette drain was placed in the lower angle of the incision and carried down to the caecal region and also into Douglas' cul-de-sac. Owing to the difficulty in getting adequate exposure at the beginning of the operation the right rectus muscle was cut through.

The patient was returned to the ward in a very weakened condition. She had a quiet night, but was much nauseated and saline infusions were given. On May 6 the retention catheter which had been left in the bladder was removed. On May 7 a note was made that the nausea still continued. The patient gradually improved, although the abdominal incision broke down over a considerable area. After several days a small amount of urine commenced to escape from the abdominal wound. On June 25 it was noted that the wound looked very well. The leakage of urine had ceased. On the day of her discharge, June 27, the following note was made: "The abdominal incision has healed well. There is no tenderness, but still a little thickening of the incision. The patient has gained in weight and has generally improved. A No. 9 cystoscope was introduced into the bladder. No reddening was found. The mucous membrane was everywhere white, glistening, and smooth, and the bladder-vessels were not injected. The urine was perfectly clear."

*Path. No. 11,534.* Sections from the wall of the sac show that it consists partly of omentum, partly of granulation tissue, which is very oedematous. The right ovary is oedematous and cystic and measures 6.5 x 5.5 x 3 cm.

In this case the uterus had evidently ruptured at the time of the patient's severe pain and the fetus had escaped into the right lower abdomen. A slow inflammatory process had gradually developed, and eventually the ends of the long bones had been forced through into the bowel and bladder.

## III. A FURTHER CASE OF ADENOMYOMA OF THE RECTOVAGINAL SEPTUM

At the last meeting of the Southern Surgical and Gynecological Association I reported two cases of this character. At that time I referred to two instances recorded by Cuthbert Lockyer and also mentioned two specimens sent me by Dr. D. S. Jessup.

Dr. Jessup has since reported his two cases in full in the Section on Pathology and Physiology of the American Medical Association, 1914. Recently another patient with adenomyoma of the rectovaginal septum has come under my care.

Miss K. T., aged 30, was referred to me by Dr. Alexis McGlannan, October 16, 1914. I first saw this patient at the Johns Hopkins Hospital on November 10, 1906. At that time I removed the left tube and ovary and resected a portion of the right ovary. The appendix was also removed. When I saw her again she complained that she was incapacitated for two days before and after her period and that her suffering was almost unbearable. She was well nourished, weighed 170 pounds, and for the previous two or three months she had been having about six bowel movements a day. The stools had been normal in color. Her discomfort had been so great that she insisted on having something done.

Operation, October 10, 1914: On opening the abdomen we found adhesions everywhere in the

pelvis, and the rectum was almost completely obstructed just posterior to the cervix. We found it necessary to do a complete hysterectomy. This was accomplished with much difficulty. The ureters on both sides were outlined and the uterus was removed. The cervix was so densely adherent to the rectum, over an area about 2.5 cm. in diameter, that it was necessary to cut through this tissue, which was almost as hard as gristle. The rectum was carefully examined and found to be almost completely obstructed. It was then brought up as far as possible. Its peritoneum was severed but its vessels were not disturbed. After the rectum had been freed for about eight inches the pelvis was packed with gauze and the anal margin all the way around was incised just as for an extensive Whitehead operation. About eight inches of rectum were then drawn through the anus and removed together with the growth. The rectum was then attached to the skin. The patient did not lose very much blood considering all that was done.

After she was returned to the ward her pulse steadily increased, although there was no evidence of hemorrhage. About seven hours after operation signs of sudden cardiac dilatation developed and the patient soon died.

The growth, situated between the cervix and the rectum, was intimately blended with both. It was

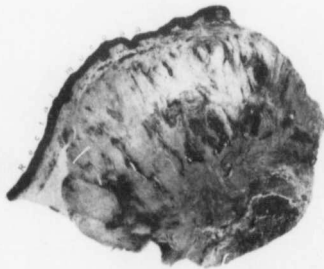


Fig. 3. Adenomyoma of the rectovaginal septum. The upper dark ribbon is rectal mucosa, which is intact. Intimately blended with the rectum is a well-defined and relatively circumscribed growth. Scattered throughout it are isolated glands surrounded by stroma and large islands of typical uterine mucosa. For the appearance under the high power see Fig. 4.



Fig. 4. Adenomyoma of the rectovaginal septum. This is one of the islands of mucosa seen in Fig. 3. The glands are identical with those of the uterine mucosa, and they lie embedded in the characteristic stroma of the mucosa. This shows some small round-cell infiltration. Surrounding this island is the usual diffuse myomatous tissue.

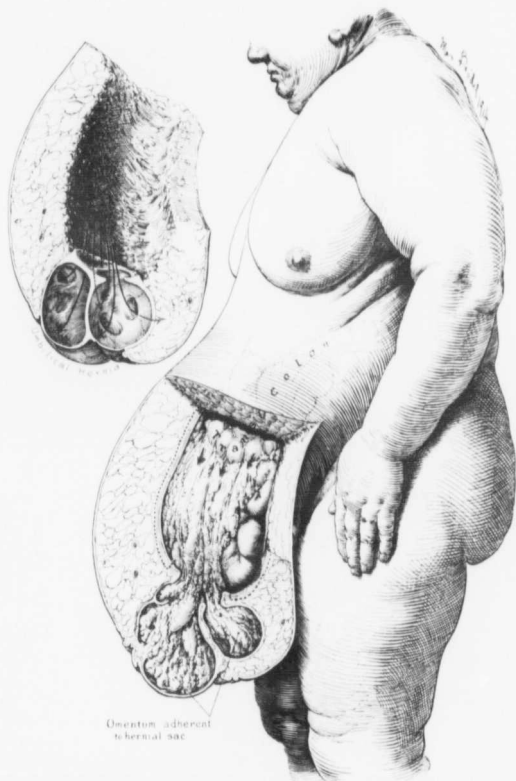


Fig. 5. An umbilical hernia and a markedly pendulous abdomen in a patient weighing 404 pounds. This is a sketchy outline of the condition found. With the patient standing the dependent portion of the abdomen reached the knees. As the omentum was adherent to the hernial sac the transverse colon was markedly drawn downward. The dotted line indicates the line of dissection, the fat of the abdominal wall being removed down to the fascia. The hernial sac was divided into numerous secondary cavities. This is particularly well seen in the upper sketch of the hernial sac, which was drawn after removal.

about 3 x 2 cm., very dense in texture, and projected into the lumen of the bowel. The rectal mucosa itself was intact, normal, and showed no evidence of ulceration or inflammation. In some places the muscle of the myoma was continuous with that of the bowel. At other points a little adipose tissue intervened or lobules of fat were surrounded by nonstriated muscle.

Scattered throughout this myomatous growth, which was diffuse in character, were islands of uterine mucosa (Figs. 3 and 4). In some places just a triangle of the typical stroma of the mucosa was visible. At other points were isolated glands, surrounded by stroma; or a small cavity was seen lined with cylindrical epithelium, which had glands extending into it. In other places there were large areas of uterine mucosa surrounded by the char-

acteristic stroma, or there was a long drawn out ribbon-like mass of stroma with one or two long and tortuous glands lying in it. In some sections there was a definite area of mucosa, at least 8 mm. long by 3 mm. broad. Here, with the low power, the mucosa occupied more than one field, no muscle being visible. Such areas are really miniature uterine cavities.

The growth is a typical adenomyoma of the rectovaginal septum, evidently starting in or near the cervix and gradually invading the rectum by continuity, but respecting the rectal mucosa at all points. The bowel was so nearly obstructed, however, that we were forced to remove at least 8 inches. The ideal method would have been to excise the area of the growth and then close up the defect.

#### IV. OPERATION FOR THE RADICAL CURE OF AN UMBILICAL HERNIA IN A PATIENT WEIGHING 464 POUNDS

Mrs. C. J., aged 35, was admitted to the Church Home and Infirmary, February 11, 1914. She had had five children, the youngest being eight months old. At the time of her marriage she weighed 225 pounds. Her weight on admission was 464 pounds. She complained of an umbilical hernia which was about 10 cm. in diameter. When on her feet, the abdomen hung down to the knees. The dragging sensation caused thereby was so great that she was forced to keep off her feet as much as possible.

Operation, February 12, 1914: I was unwilling to operate and explained the danger to her husband. The patient, who is still a relatively young woman, said she was becoming a semi-invalid and insisted that she be relieved. On account of the marked redundancy of the abdominal wall, we decided to remove a large quantity of fat with the hernia, as advocated by Dr. Howard A. Kelly. Accordingly a large transverse, elliptical area was outlined (Fig. 6). This area, when measured after removal, was 36 inches from side to side and 19 inches from above downward. The adipose tissue of the tremendous flap was dissected from the fascia of the abdominal wall all around as far as the neck of the hernia. Then, with the finger in the abdomen as a guide, the neck of the sac was cut at its approach to the abdominal wall. The dotted line in Fig. 5 indicates the line of dissection. The omentum in the sac was so intimately blended with the walls of the sac that this portion was cut off and removed together with the sac and redundant tissue.

In the upper sketch in Fig. 5 Mr. Brödel has clearly shown the neck of the sac and the numerous chambers passing off from it. The hernial opening was closed by the Mayo method of sliding the fascia of the lower margin of the opening up under that of the upper margin. We used kangaroo tendon for the mattress sutures and, after the first row had been placed and tied, the edges of the upper flap were

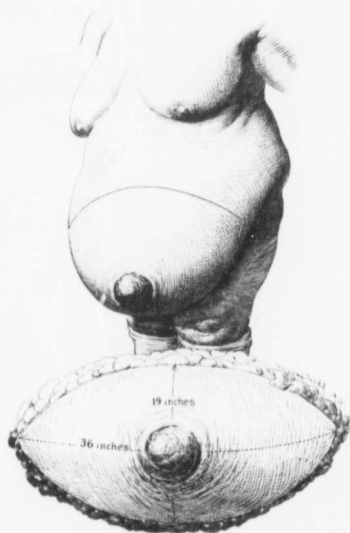


Fig. 6. An umbilical hernia associated with marked prolapse of the abdominal wall. The umbilical hernia was about 10 cm. in diameter. The elliptical transverse incision is indicated by the black line. The lower figure indicates the shape and size of the piece of adipose tissue removed.

fastened down with a second row of mattress sutures. The abdominal wound was now approximated by interrupted silver wire and silkworm-gut sutures. Accurate skin approximation was obtained by continuous black silk thread. At each end of the incision a protective drain was introduced.

The patient made a speedy recovery and the abdominal wound healed perfectly. When the stitches were removed the abdominal incision had contracted until it measured only 27 inches from side to side. The patient, eight months later, was in excellent health.

#### V. REMOVAL OF A LARGE TUBERCULOUS CYST OF THE MESENTERY OF THE JEJUNUM, TOGETHER WITH THE CORRESPONDING SEGMENT OF BOWEL; RECOVERY; LATER DEATH APPARENTLY FROM TUBERCULOUS MENINGITIS

Baby R., a frail girl, 2½ years old, was referred to me by Dr. Julius Friedenwald and Dr. Harry Goldberg on May 27, 1914.

Two weeks before her admission to the Church Home and Infirmary a tumor was first noted in the upper abdomen. This was globular, appeared to

be about 10 cm. in diameter and could be pushed from one side of the abdomen to the other. It lay somewhat to the left of the median line.

There was a leucocytosis of 15,000. The urine was normal. The history gave absolutely no clue as to the probable character of the growth. The majority of those who saw the patient thought that the tumor was probably an enlarged left kidney, but no one ventured a positive diagnosis.

Operation: I made a median abdominal incision, commencing a short distance below the xiphoid and ending near the umbilicus. The tumor lay below the transverse colon and was covered over by a greatly reddened, thickened, and adherent omentum (Fig. 7.) The omentum was cut across near the transverse colon and we gradually loosened up the cystic tumor, freeing it from several loops of small bowel and separating it from the adherent mesentery. After getting good exposure, we found that the tumor sprang from the mesentery of the jejunum. We continued our dissection, hoping that it would be possible to completely enucleate the cyst without injuring the blood supply of the jejunum. When this had been almost accomplished, the tumor having been freed except over an area of about 3 x 3 cm., a little pus commenced to escape. Fortunately, the tumor was at this stage of the operation mobile enough to be partially lifted out of the abdomen. It was slit open and evacuated into a large basin with little or no contamination of the abdominal contents. The sac contained about 700 ccm. of a rather thin greenish yellow, odorless pus. When empty it was clamped off and removed. It was then found that the blood supply of a large area of the jejunum had been cut off, as the same vessels that supplied the tumor also supplied the bowel. It was further seen that no matter in what manner the sac had been removed the blood supply of the bowel must of necessity have been cut off. The portion of the jejunum which had lost its blood supply was clamped and cut (Fig. 7). Both ends were closed and a lateral anastomosis was made. It had been necessary to cut off the jejunum about three inches from the point where it passed to the left over the vertebral column. This short end naturally made the anastomosis rather difficult. A cigarette drain was carried down near, but not to, the point of anastomosis and the abdomen closed.

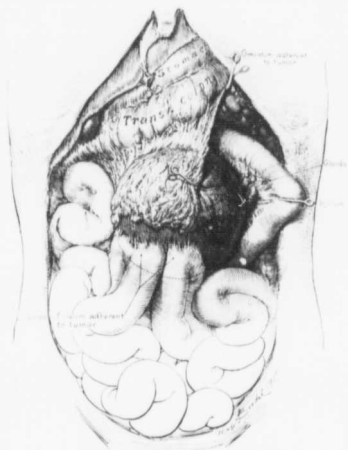


Fig. 7. A tuberculous cyst springing from the mesentery of the jejunum. The cyst was globular, occupied the center of the upper abdomen and was partly covered by adherent, red, and greatly thickened omentum. Below it was adherent to several loops of small bowel. The omentum was severed near the transverse colon and the loops of small bowel were liberated. The cyst was then gradually loosened, as far as feasible, from its attachment to the mesentery. The loop of jejunum here shown was thickened, but at operation seemed to be normal. A glance at Fig. 8, however, demonstrates that its mucous coats are much thicker than usual. In the mesentery of the jejunum are markedly enlarged lymph-glands.

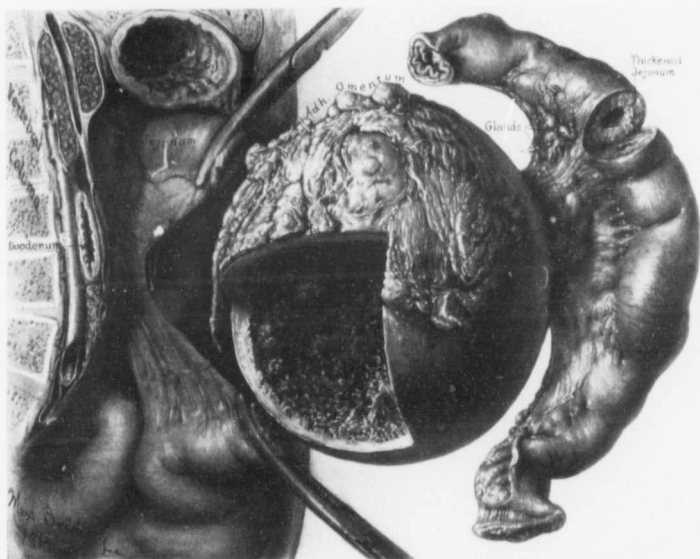


Fig. 8. Tuberculous cyst of the mesentery of the jejunum. Resection of the jejunum together with the cyst. Temporary recovery. The right half of the drawing showing the mesenteric cyst and the jejunum is an accurate portrayal of the specimen removed. The left half gives a more or less schematic representation of the relation of the cyst to the body. The cyst was spherical, had a definite basal mesenteric attachment, about 3 x 3 cm., and was covered with greatly thickened indurated omentum. The cyst walls varied from 2 to 3 mm. to 1 cm. or more in thickness. The inner surface presented a fri-

able, worm-eaten appearance and the pus was odorless, rather thin, and greenish yellow in color. At the cut ends of the jejunum the mucosa is practically normal, but a section near the center of the loop shows marked thickening of the bowel wall, together with much narrowing. As shown in the illustration, the glands in the mesentery are considerably enlarged. The ends of the bowel which were held by forceps were closed and a lateral anastomosis was then made. This was a rather difficult procedure on account of the shortness of the remaining portion of the jejunum.

Within a few hours after operation the child was carried out on the veranda and there she remained throughout her sojourn in the hospital. She steadily improved and had no abdominal complications whatsoever. About two weeks after operation a partial facial paralysis was noted on the left side, but this did not interfere with her recovery.

*Path. Nos. 20,246 and 20,287.* Sections through the wall of the sac show that the outer surface is composed of fibrous tissue poor in nuclei. In some places it has a laminated arrangement. At other points the fibers run in all directions. There is a good deal of hyaline transformation. As one approaches the inner surface there is a tremendous amount of

small round-cell infiltration and the tissue at certain points looks like ordinary granulation tissue, having a very abundant blood supply. Where this granulation tissue exists, the inner surface of the sac is covered with fibrin, which has in its meshes small round cells and polymorphonuclear leucocytes. At other points scattered through the granulation tissue are giant cells. Some of these resemble tremendous plaques of protoplasm with rather deeply staining nuclei scattered throughout it. At other points are round or oval areas of protoplasm with oval or vesicular nuclei arranged chiefly around the margin of the large cell. At other points are tremendous giant cells surrounded by

small round cells or separated from the round cells by a zone of epithelioid cells. In other words, the picture is that of typical tuberculosis. In some places ten to fifteen giant cells are visible in one field. This is without doubt a tuberculous cyst of the mesentery of the jejunum. Sections from the growth in the small bowel failed to show any evidence whatsoever of tuberculosis.

In four or five weeks the patient was walking well and was going from her home to the Johns Hopkins Hospital to receive electrical treatment for the facial paralysis. She came to see me at the office shortly before the summer vacation.

Dr. Goldberg tells me that during the summer her appetite was good and that she gained four pounds. Suddenly, about two months after the operation, she was taken with severe headache, which at first was occipital, but which later extended all over the head. On the next day, when Dr. Goldberg saw her, she was in a semi-comatose condition, was irritable and cross and wished to be left alone. The light seemed to hurt her eyes and she did not care for food and water. The pupils were dilated and gave little or no reaction to light. The respirations

were rapid, the pulse was quick, the temperature 99.4°. The heart and lungs were normal, the abdomen was scaphoid. The child lay with her limbs flexed and with her face away from the light.

She remained in this condition for several days. She was obstinately constipated. After the bowels had been emptied she showed some improvement for a few hours, but soon lapsed into her former condition. Some difficulty was noted in swallowing. This gradually increased and during the last two days the child refused all nourishment. Finally she became comatose and died. Three days before death partial opisthotonos was noted. There was backward traction of the head, but the knees were not drawn up.

Dr. Goldberg was unable to get an autopsy, but the clinical picture, coupled with the abdominal findings at operation, strongly suggested tuberculous meningitis as the cause of death. A tuberculous condition of the meninges is little to be wondered at when we remember the massive primary focus of tuberculosis in the mesenteric cyst.



The Relation of Obstetrics, Gynecology and Abdominal Surgery  
to the Public Welfare

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THOMAS S. CULLEN, M.D.  
BALTIMORE

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CHICAGO

The Relation of Obstetrics, Gynecology  
and Abdominal Surgery to the  
Public Welfare

THOMAS S. CULLEN, M.D.  
BALTIMORE



THE RELATION OF OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY TO THE PUBLIC WELFARE \*

THOMAS S. CULLEN, M.D.

BALTIMORE

To be selected chairman of any section of the American Medical Association is an honor which a man may be proud of; to be named the presiding officer of this very important section was a compliment I little dreamed of, and I am deeply grateful for the confidence placed in me.

An artist from time to time steps back from his easel to get a good view of the painting he has in progress. The business man at regular periods takes stock to see what are his assets and liabilities. We in like manner should at frequent intervals leave our labors and, figuratively speaking, ascend the mountain peak whence we may overlook the plain of our daily labors and may be able not only to see what has been accomplished but also to detect the weak spots, the points at which our endeavors have fallen short.

In the time allotted to the presiding officer I shall briefly give a panoramic view of obstetrics, gynecology and abdominal surgery as I saw them twenty-five years ago, and shall then compare them with the same branches of medicine as we find them today.

THE OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY OF TWENTY-FIVE YEARS AGO

*Obstetrics.*—In many localities, obstetrics and diseases of children were still linked together, the accoucheur not only looking after the child at birth but also attending to it during its early years. With the gradual awakening to the fact that childrens' sore

\* Chairman's address, read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

throats were often streptococci in origin, that a case of puerperal fever might follow the too close association of the obstetrician with a case of scarlet fever, that diphtheria was due to a definite germ; and further, with the rapid development of pediatrics into an important specialty, it was deemed wiser to separate the practice of diseases of children from that of obstetrics. Thus at the time of my graduation, just a quarter of a century ago, we had one relatively small, although splendidly equipped, lying-in hospital in a city of about 125,000. It was presided over by a most capable physician who limited his work almost exclusively to obstetrics. He not only obtained excellent results but was also a most able teacher—a man who left his impress on all those who had the privilege of his instruction. Few obstetric teachers did more conscientious work than did Adam Wright who, I am glad to say, is still with us.

*Gynecology.*—In my student days the pupils learned that there were anteversions, anteflexions, retroversions and retroflexions and that some of the displacements might be relieved by appropriate pessaries. We were told of erosions of the cervix and had the value of zinc chlorid or Churchill's tincture of iodine as the proper agents in the treatment for such conditions drilled into us day after day. Much stress was laid on laceration of the cervix, and many repairs were done. Now and again a torn perineum was also treated surgically.

Abdominal gynecologic operations were limited almost entirely to the removal of large ovarian cysts. An occasional myomatous uterus was removed, but the fatality in this class of cases was so high that the operation was rarely attempted. We occasionally heard of cancer of the cervix or of carcinoma of the body of the uterus, but the only operative procedures we were familiar with for this dread disease were curettage, and cauterization of the carcinomatous cervix. To entirely remove the uterus for this condition was not thought of.

*Abdominal Surgery.*—Fractures were well handled and the surgery of the outside of the body and lateral lithotomy were successfully and dextrously performed, but abdominal operations were undertaken with great trepidation. Surgery of the stomach was rarely if ever

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seen. Gallstones were not removed, and I have seen a leading medical consultant watch an appendix abscess for over a week, hoping that it would soon rupture externally. The appendix was rarely, if ever, removed. As an intern in the medical ward, I watched a patient with a perforation due to typhoid ulcer for seven days — until the woman's death — when the diagnosis was verified at necropsy. One of the abdominal cases most vividly impressed on my mind was that of a thin, elderly man with definite intestinal obstruction. He was in good condition when he entered the hospital, but gradually grew worse and died after a few days. Through a small hole in the mesentery a short loop of the small bowel had passed. Even at necropsy this loop could be pulled back with the utmost ease.

The experiences I have just related occurred in a large institution presided over by most capable medical men and surgeons. I have mentioned them in no spirit of criticism whatsoever. Their modes of treatment were similar to those carried out in nearly all the hospitals throughout the land, and the same hospital today is doing first-class up-to-date surgery. To you who have been in practice these many years our former failures are too well known. For those of you who have graduated within the last fifteen or twenty years it is well to realize what great strides have been made in abdominal surgery and gynecology during the last two decades.

I will now pass to the consideration of the obstetrics, gynecology and abdominal surgery of today — a theme with which you are much more familiar.

#### THE OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY OF TODAY

*Obstetrics.*—The recognition of the absolute necessity of a thorough obstetric training is realized throughout the land, and adequate lying-in hospitals are being furnished in numerous cities — not in all, I am sorry to say. The medical students in many of the schools not only see a large number of births but individually must look after a certain number of obstetric patients. In addition, they receive a systematic course of instruction in obstetric pathology. The fundamental handling of obstetric cases has naturally not undergone so marked a change as has the treatment of gynecology.

cologic and abdominal cases, because gynecology and abdominal surgery are relatively new fields.

*Gynecology.*—To the older members of the profession the "gynecologist" may still suggest the pessary and Churchill's tincture of iodine; and it is hard for them to realize that at the present day the surgical procedures dealing with the perineum and of the pelvis are on just as firm and stable a basis as is the surgery of other portions of the body. The fundamental knowledge we owe in large measure to the pathologist, who has traced out the pathologic conditions from the beginning and has indicated the paths along which the disease may travel. For example, given a patient with a gonorrhoeal infection, we have only to remember that the germ comes from without. It may invade Skene's glands and the urethra; it may implicate Bartholin's glands, and then in succession the vagina, the cervix, the body of the uterus, the tubes and finally the pelvic peritoneum. Knowing the mode of progression of this infection, we can the more intelligently adopt the appropriate medical or surgical procedure.

We now know that a perineal operation alone may be of little value in the treatment of a case of prolapsus, and that failure will often follow if we do not at the same time shorten the round or uterosacral ligaments.

Our knowledge of tubal and ovarian diseases is sufficiently accurate to enable us in many cases to do conservative operations instead of unsexing the woman. Our studies of uterine tumors supplemented by an improved technic now enables us to do a supravaginal hysterectomy with little risk to the patient. When a patient complains of uterine hemorrhage we can usually within twenty-four to forty-eight hours tell her with a surprising degree of accuracy the cause of this hemorrhage.

Twenty-five years ago cancer of the uterus was nearly always fatal; today it is far more amenable to treatment. Fully two thirds of all cancers of the body of the uterus can be permanently cured if operated on early, and some surgeons have been able to report 25 per cent. of their patients operated on for cancer of the cervix as well five years later. When the splendid work being done by the American Society for the Control of Cancer, the Cancer Campaign Committee of the Clinical Congress of Surgeons, and the Cancer

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Committee of the Council on Health and Public Instruction of the American Medical Association has sunk deep into the minds of the laity of this country, the results will be even more encouraging.

I might dwell at length on the fundamental advances made by Howard A. Kelly and others in the methods of studying diseases of the bladder and kidney, but with these far-reaching contributions to gynecology you are also thoroughly familiar.

*Abdominal Surgery.*—The advances in abdominal surgery during the last twenty-five years have been so marked that they are almost overwhelming. Even fifteen years ago the ruptured appendix with or without a peritonitis was exceedingly common. The general practitioner has become such a champion of early operation that in many clinics, if the appendix happens to be ruptured when the abdomen is opened, he at once chides himself for any possible delay that may have occurred. Just here I should like to say that I am thoroughly convinced that in the past the one or more doses of calomel and the subsequent dose of salts have been in a large measure responsible for the appalling conditions found at operation. Thus far I have never seen a patient die who was operated on for appendicitis before the appendix ruptured.

Twenty-five years ago few operations were performed on the gallbladder. Now if there be any prolonged discomfort or distress in this region, the gallbladder is promptly explored, in the vast majority of cases with permanent relief. The stomach washings, which were so prevalent even a decade ago, have in a large measure disappeared as a result of the prompt removal of the appendix or drainage of the gallbladder according to the nature of the case, and are, as a rule, resorted to only when it is necessary to make gastric analyses.

Operations on the stomach were formerly rarely undertaken. Now gastro-enterostomy is a common and relatively safe procedure. Ulcers are removed, strictures relieved, and where carcinoma is suspected, an exploratory operation is done at the earliest possible moment.

Inseparably coupled with the advances made in this branch of surgery are the names of William J. Mayo, John M. T. Finney, W. L. Rodman and many others.



Intestinal surgery twenty-five years ago was in the experimental stage, and we in this country are indebted to Nicholas Senn, William S. Halsted, Franklin P. Mall, John B. Murphy and others for their pioneer experimental work in this direction. When intestinal obstruction develops, we do not now fold our hands, saying that the case is hopeless, but at once do an enterostomy and, when the patient has improved sufficiently, hunt for the cause of the obstruction if nature has not in the meantime corrected it. I might describe the advances made in the surgery of other parts of the abdomen, but with these you are also familiar. The great strides made in abdominal surgery and in gynecology have of course been rendered possible by the fundamental labors of Louis Pasteur and Joseph Lister, and by those of Robert Koch,<sup>1</sup> who in 1878 published his important paper on the causation of diseases from wound infection. Dr. W. W. Ford,<sup>2</sup> in speaking of this work says:

In this paper Koch puts forward clearly the exact state of knowledge on the subject of surgical infections; he explains the difficulties which had to be overcome in working out their etiology and describes the results which others before him had achieved.

To those of you who have had a share in this great advance it must have been the source of the utmost satisfaction. To have lived during this period has been a great privilege. The progress in abdominal surgery of the last twenty-five years has without a doubt been greater than will ever occur in a similar period. The immediate death rate has been reduced from about 25 per cent. to 2 or 3 per cent.; thus, if we temporarily relieved all patients we could reduce our mortality only 3 per cent. more.

There is no reason, however, why we should be in the least complacent. Many of our patients suffering from tuberculous peritonitis are only temporarily relieved. We are helpless in our cases of general peritoneal carcinosis, and many cases of cancer of the stomach, intestine, uterus and ovaries are beyond our control. There is still much to be accomplished.

1. Koch, Robert: Untersuchungen über die Aetiologie der Wundinfektionskrankheiten, 1878.

2. Ford, W. W.: Bull. Johns Hopkins Hosp., 1911, xxii, 420.

THE ALIGNMENT OF OBSTETRICS, GYNECOLOGY  
AND ABDOMINAL SURGERY

With the rapid development in these three branches, new problems have arisen, and it may be well for us to consider briefly the relation that these three branches in question should bear to one another.

*Obstetrics.*—A thorough knowledge of this art is infinitely more important to the student than is a clear understanding of gynecology. The vast majority of medical students after graduation attend obstetric cases. These young general practitioners, if living in a fair-sized town or city, may when in trouble be able to consult with an obstetric expert, but often the practitioner's time for temporizing is so limited that he must rely absolutely on his own initiative. The physician living in the small town or in the country must pilot his patient through the dangerous shoals, relying entirely on the knowledge he has obtained from his former teachers, coupled with his own liberal supply of good horse-sense.

Gynecologic cases rarely call for such speedy treatment. If the general practitioner is uncertain as to his diagnosis and does not know just what to do, he can, as a rule, temporize for a day or two and in the meantime have a consultation with a gynecologist. Furthermore, most of the gynecologic patients are well enough to journey to the city to see the consultant at his office or at the hospital.

In obstetric cases the vast majority of the physicians are obliged to take full charge of the case irrespective of its gravity; hence the absolute necessity of our turning out graduates of medicine thoroughly grounded in the theory and practice of obstetrics. Dr. J. Whitridge Williams<sup>3</sup> has given us a most comprehensive summary of the obstetric teaching in this country, and pointed out in no uncertain terms the growing need for better methods and facilities.

In years past some of the prominent members of the profession tried to confine their labors to obstetrics and gynecology. A few succeeded, but as their practices increased the majority either became obstetricians or confined their work almost entirely to gynecology.

3. Williams, J. Whitridge: Has the American Gynecological Society Done Its Part in the Advancement of Obstetrical Knowledge? *THE JOURNAL A. M. A.*, June 6, 1914, p. 1767.

This was but natural, as these two branches cannot be well handled together. In fact, obstetrics is similar to emergency surgery. No one can decide exactly when the birth will take place, nor can he determine with any degree of accuracy how long labor will last.

Supposing the surgeon who practices these two specialties arranges for four abdominal operations for tomorrow morning, and that just as he is leaving for the hospital to operate he receives an urgent call to come and see one of his primiparas who is in labor. If this confinement lasts several hours, these four operations have to be postponed, the postponement causing much added anxiety not only to the four patients but also to the various relatives. A few such delays as this, and the friends of the patients will naturally look for surgeons that can be relied on to fulfil their engagements promptly. In a way this is very unfair to the obstetrician, inasmuch as the delay has been in no way his fault; and yet the fact remains that it has been due entirely to an attempt on his part to combine two specialties that are not compatible with one another.

Again, let our surgeon arrange for a Wertheim operation on a cancer patient for tomorrow morning. This is without doubt one of the hardest abdominal procedures. The surgeon should be in the pink of condition, and it should be his first operation for the day. During the night he is called out to an obstetric case and is detained several hours. If he operates in the cancer case on schedule time, is he doing justice to himself or to his patient?

Is there any wonder that many physicians have given up this combination of obstetric and gynecologic practice? When asking your young medical men what line of work they are doing, they will often say that they are at the present time paying particular attention to obstetrics, hoping later to enter the surgical ranks; and many of the older men, who have good obstetric practices, are relegating that work to associates as their surgical practice increases. Do you blame them? Few there are who would not do likewise. When we look at the subject squarely, it is clearly evident that the obstetric specialist is the true missionary of the medical profession, and the most unselfish member in its ranks. Even though he be the

head of his department, his time is not his own and there is no hour of the day or night when he may not be called.

From what Dr. Williams has told us, the obstetric training in America is not what it should be. Is it going to be improved if the head of the department, whenever possible, naturally but gradually drifts over into surgery, leaving the obstetric teaching, both practical and theoretical, largely in the hands of his associates? It is the duty of this Association to so improve the facilities and opportunities of the obstetrician that he will devote all his energies to the furtherance of this all-important branch of medicine. I say "all-important," because on his teaching and practice depends in large measure the life and happiness of the coming citizens of this land.

With the rapid progress in medicine and surgery, the needs of the obstetric clinics have been in large measure relegated to the background. All large hospitals should have capacious and well equipped lying-in departments and I feel confident that in the near future even the smaller towns will erect up-to-date lying-in hospitals.

The young obstetrician in his preparatory training should include a thorough knowledge of medicine, pathology and bacteriology, and should also serve as a surgical assistant for a relatively long period before taking up his work in obstetrics. When he starts out as a trained obstetrician, he should be able at once to meet any abdominal or perineal surgical emergency that he may encounter. The obstetrician has the right to demand that every possible facility be afforded him. Not until this fact is so thoroughly realized that it is acted on by the profession, will the best men be content to remain in this important but arduous field of labor.

If it could be so arranged that all private obstetric patients were delivered in maternity hospitals, the wear and tear on the obstetrician would be greatly lessened, and he would then have more time to work out the many important and still unsolved problems connected with this branch of medicine. Some of the problems extend over into other branches. Menstruation is undoubtedly one of these. Much has been said about it, but thus far little is known. It seems to me that it will require the combined labors of the anatomist,

physiologist, physiologic chemist, obstetrician and gynecologist, together with much experimental work, before our knowledge on this subject becomes in any way complete.

*Gynecology and Abdominal Surgery.*—In the early days in this country travel was confined to the seaboard and rivers. If one wished to go from Baltimore to New York, the journey was made almost exclusively by water, and was one extending over several days. Gradually paths were carried back into the wilderness for a short distance, and later primitive roads were built and finally good stage roads. It was then possible to travel by fast relaying from Baltimore to New York in a few days. Now our express trains require four hours between these two points.

The progress in abdominal surgery and gynecology bears a striking resemblance to the gradual evolution in travel. In the beginning, only the outer surface of the abdomen and the vagina could be operated on. At a later date an occasional excursion was made to the abdomen, as successfully carried out by McDowell. With the epoch-making discovery of asepsis, the motive power was furnished, enabling us to traverse all parts of the abdomen. Since that date the "civilizing" influences have been gradually extended until the abdomen and its contents are fairly well understood: There still remain, however, a certain number of dismal swamps and everglades.

The greater part of gynecology deals with the surgery of the lower abdomen. Sometimes the operation is entirely confined to an exploration of the abdomen, but frequently, as in prolapsus cases, in order that a satisfactory result may be obtained, it is also necessary to carry out some vaginal operation in connection with that in the pelvis. Where large tumors exist, the confines of the pelvis are temporarily carried far up into the abdomen, occasionally as high as the liver, and now and then the intestines are densely adherent and may require resection.

In a no mean percentage of the cases, digestive disturbances are associated with a pelvic lesion, and naturally require investigation at the time of operation. The surgeon, who largely confines his labors to the upper abdomen, not infrequently finds pelvic lesions

which he little suspected before the abdomen was opened.

If the gynecologist confines his work entirely to the pelvis, he will not infrequently overlook lesions in the upper abdomen, and the surgeon in like manner will miss serious pelvic trouble.

When you or I take a watch to the jeweler, we expect him to overhaul it thoroughly, examining all portions of its mechanism. If he returns it saying that the mainspring which was broken has been repaired, but the watch still will not go, we are naturally dissatisfied and will try a more competent man. If we do not carefully explore the abdomen in all cases, we are bound to overlook many little-dreamed-of pathologic conditions—conditions that will still render the patient uncomfortable.

Suppose I have done some pelvic operation and have overlooked gallstones or a duodenal ulcer. The patient will usually be far from well and will in a few weeks or months decide to call in a man capable of properly treating the upper abdominal lesion. What does this lack of preparedness on my part entail for the patient? Twice the length of time in the hospital, twice the amount of pain, twice the amount of hospital expense and two operation fees, not to speak of the added risk of the second operation. This is an age of economy, an age of short cuts, and an age when by-products are utilized to the limit. It will not be long before the laity will demand that any one who enters an abdomen must be capable of doing everything necessary in that abdomen, and in those cases in which, on account of the lesion present, a second operation is required, it will be necessary for us to explain carefully just why the abdomen must be opened again. Some one will say, "This is all very well; you should make an accurate diagnosis beforehand." This might be perfectly plausible if the anterior abdominal wall were made of plate glass, but even then, as we all know, sometimes, when the abdomen has been opened, it requires considerable search to find the exact location of the trouble. Now and then, when visiting the clinics of well-known surgeons, I cannot help feeling a twinge of wicked pleasure on seeing that their diagnoses do not always tally with the findings—it makes me feel thoroughly at home. The only abdomi-

nal surgeon who makes no mistakes in diagnosis is either the one who has no practice or the one who has given up the scalpel.

In recent years, business men have been greatly aided by economy or efficiency experts. Strangers come in, look over the business and see where, by more efficient methods, more may be accomplished, often with diminished labor. If we called in such an expert, what would he say? In the first place, he would point out that it is not necessary for two classes of surgeons to work in one abdomen—a space the confines of which nature has so well defined. In the second place, he would say to both the surgeon of the upper abdomen and to the surgeon of the lower abdomen: "You have spent long years in preparing yourselves for doing abdominal surgery, you have mastered the fundamentals of medicine, you have a good knowledge of bacteriology and pathology and have perfected yourselves in the methods of operation; and yet, because one pelvis happens to contain a small round muscular body with two smaller bodies on the sides, one of you confines your work in large measure to men, the other to women. You are only running half capacity. There is absolutely no reason whatsoever why you should not both do abdominal surgery in the two sexes. It is practically the same, the only difference being that there is no operation in abdominal surgery that can compare in difficulty with a complicated Wertheim operation for cancer of the cervix." After seventeen years' experience in abdominal surgery in men and women, I myself am absolutely convinced that pelvic surgery offers many more difficulties and is harder of execution than is the surgery of the upper abdomen.

#### THE TRAINING OF THE ABDOMINAL SURGEON

Every man who aims to make abdominal surgery his life work should have a most thorough training in general medicine. He will then not forget that pain in the right iliac fossa does not always mean appendicitis. He will know that occasionally this soreness is present in an early stage of typhoid fever. He will remember that there is such a thing as lead colic and that in children severe abdominal pain may be the precursor of a pneumonia. A thorough knowledge of this most

fundamental and broadest branch of medicine will save him from many pitfalls.

In addition to his course in general pathology he should have an extensive knowledge of the pathology of all the abdominal structures. The abdominal surgeon of the future must be a well-grounded pathologist; two years in the necropsy room would be of inestimable value to him. Then he should pay particular attention to the bacterial flora associated with the various abdominal lesions. He has now finished his apprenticeship, and should become an assistant of an abdominal surgeon. Here he will not only learn the various operative procedures and perfect himself in these, but he will also become experienced in the preparatory and after-treatment of the patients. The after-treatment, by the way, is of great importance, the postoperative journey often being rough and tempestuous, or relatively smooth, according to the manner in which the assistant handles the case. After several years spent in this way, the assistant is thoroughly competent to start out on his career. The surgery of the United States has made wonderful strides during the last decade. We must prepare ourselves to become the graduate school for the world.

#### CONCLUSION

In the brief time at my disposal I have hastily scanned the salient points relating to obstetrics, gynecology and abdominal surgery, the subjects treated in our section. Necessarily much has been omitted. The points that I want to leave with you are:

1. Obstetrics must be made more attractive, so that those entering this branch will not be tempted to leave it for less laborious fields.
2. Any surgeon opening the abdomen should be capable of doing everything necessary in that abdomen. In other words, gynecology and abdominal surgery logically belong together.
3. This realignment of abdominal surgery is absolutely necessary if we are to accomplish the maximum amount of good for the patient.

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EARLY TUBERCULOSIS OF THE CERVIX

By THOMAS S. CULLEN, M.B., F.A.C.S., Baltimore, Maryland

*Reprint from*

*SURGERY, GYNECOLOGY AND OBSTETRICS*

*March, 1916, page 261*

## EARLY TUBERCULOSIS OF THE CERVIX<sup>1</sup>

By THOMAS S. CULLEN, M.B., F.A.C.S., BALTIMORE, MARYLAND

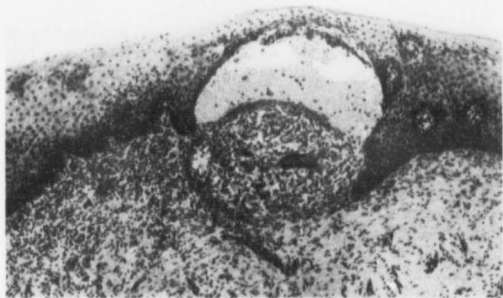
**A** FEW weeks ago, when taking up diseases of the cervix with my class in Gynecological Pathology at the Johns Hopkins Hospital, we encountered the following striking example of very early tuberculosis of the cervix:

Gyn. Nos. 19,534 and 20,660. The patient, a healthy looking colored woman, 27 years of age, was admitted to the Johns Hopkins Hospital on October 16, 1914, complaining that she had been discharging fecal matter through the vagina for two years. She had been married six years but had never been

The bladder and tube were freed and the fistula between the vagina and rectum was cut across. The small opening in the sigmoid was closed. The uterus which contained several myomata was now removed, a complete hysterectomy being done.

The laboratory diagnosis was: *bilateral follicular salpingitis, uterine myomata, tuberculosis of the endometrium, tuberculosis of the cervix.*

The photograph of an area from the section of the cervix shows at each outer portion of the picture normal squamous epithelium with a normal underlying stroma. In the center, the superficial portion of the squamous epithelium is still intact; the underlying layers of epithelium are missing, and a cres-



Gyn. Nos. 19,534 and 20,660; Gyn-Path. No. 20,640. The tuberculous process was much more advanced in the mucosa lining the cavity of the uterus than in the cervix. The cervical mucosa is intact. In the center of the field is a well-defined tubercle consisting of epithelioid cells and containing giant cells of various types. Between the tubercle and the overlying squamous epithelium is a crescentic space filled with blood. The stroma to the left of the tubercle shows some small round-cell infiltration.

pregnant. Her menses had begun at 10, but for the last five years she had had no periods.

At operation Dr. J. Craig Neel, the resident gynecologist, found the uterus in retroposition and the bladder adherent to it above the internal os. The sigmoid was adherent to the vesico-uterine reflection just above the level of the internal os. The right tube and ovary had become twisted over the anterior surface of the uterus.

centic space is seen filled with blood. Immediately beneath this is a tubercle, occupying partly the epithelial layer and partly the underlying stroma. It is sharply circumscribed, consists of epithelioid cells and contains several types of giant cells. The stroma on the left shows small round-cell infiltration.

Tuberculosis of the cervix is rare, and such an early stage as is here depicted I have never seen before.

From the Gynecological Department of the Johns Hopkins Medical School and of the Johns Hopkins Hospital. Read before the Southern Surgical and Gynecological Association, Cincinnati, December 13-15, 1915.

ADENOMYOMA OF THE ROUND LIGAMENT AND INCARCER-  
ATED OMENTUM IN AN INGUINAL HERNIA, TOGETHER  
FORMING ONE TUMOR

By THOMAS S. CULLEN, M.B., F.A.C.S., Baltimore, Maryland

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# ADENOMYOMA OF THE ROUND LIGAMENT AND INCARCERATED OMENTUM IN AN INGUINAL HERNIA, TOGETHER FORMING ONE TUMOR<sup>1</sup>

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FOR many years isolated cases of adenomyoma of the uterus have been recorded, but it was not until the epoch-making monograph on the subject published by von Recklinghausen that we were given a thoroughly comprehensive picture of this condition. In March, 1895, I reported my first case of adenomyoma of the uterus, before the Johns Hopkins Medical Society; since then I have been much interested in adenomyomata.<sup>2</sup>

In 1896 it fell to my lot to record the first case of adenomyoma of the round ligament. At this time I sent Professor von Recklinghausen a slide from the round-ligament tumor and when writing me a short time later he said that he had shown my section before the Naturforscher Versammlung at their Frankfurt meeting. Since that time quite a number of adenomyomata of the round ligament have been detected.

When analyzing the umbilical tumors recorded in the literature I encountered quite a number that had been variously diagnosed. These tumors were found only in women, tended to swell at the menstrual period, and occasionally discharged a little blood at the period. On section some of them contained small spaces filled with old blood. These tumors proved to be adenomyomata of the umbilicus. To Goddard belongs the credit for first properly interpreting these tumors.

More recently adenomyoma of the rectovaginal septum has been noted. Cuthbert Lockyer and Jessup have each recorded two cases and I have had four. In 1899 my colleague, Dr. William W. Russell<sup>3</sup> reported

<sup>1</sup>Cullen, Thomas S. Adenomyoma of the round ligament, *Johns Hopkins Hosp. Bull.*, 1896, May and June, Nos. 62 and 63; Adenomyoma uteri diffusum benignum, *Johns Hopkins Hosp. Reports*, 1896, vi; Further remarks on adenomyoma of the round ligament, *Johns Hopkins Hosp. Bull.*, 1898, No. 87 (June); Adenomyoma des Uterus, Verlag von August Hirschwald, Berlin, 1901; Adenomyoma of the Uterus, 1908; Adenomyoma of the uterus, *J. Am. M. Ass.*, 1908, January, 1, 127; Umbilical tumors containing uterine mucosa or remnants of Mueller's ducts, *Surg., Gynec. & Obst.*, 1912, May, 479; Adenomyoma of the rectovaginal septum, *J. Am. M. Ass.*, 1914, Oct., 835.

<sup>2</sup>Russell, William W. Aberrant portions of the Muellerian duct found in an ovary. *Johns Hopkins Hosp. Bull.*, 1899, 7, 8.

<sup>3</sup>From the Gynecological Department of the Johns Hopkins Medical School and of the Johns Hopkins Hospital. Read before the Southern Surgical and Gynecological Association, Cincinnati, December 13-15, 1915.

a case in which a large amount of uterine mucosa was found in the hilum of the ovary. In this instance, however, no myoma existed.

From the foregoing, it will be seen that we may find adenomyoma in the uterus, round ligaments, rectovaginal septum, or in small umbilical tumors.

Nearly three years ago I encountered another adenomyoma of the round ligament. Of this case I herewith give a brief report:

Mrs. J. Q. J., aged 44, was referred to me by Dr. N. C. Trout, of Fairfield, Pa., and admitted to the Church Home and Infirmary March 6, 1913. She had complained of a lump in her groin for several years. This was very firm and appeared to be cystic. It was about 4 cm. long, 2 cm. broad, and somewhat lobulated (Fig. 1). She also complained of pain in the appendix region.

*Operation.* I first made a median incision and found the rectum firmly adherent to the left ovary



Fig. 1. Adenomyoma of the round ligament and incarcerated omentum contained in an inguinal hernia, together forming one nodule.

*Gyn.-Path. No. 19,018.* The nodule lay a little above Poupart's ligament. It was 4 cm. long, 2 cm. broad, and somewhat lobulated. It was perceptibly larger at each menstrual period. At operation the upper part of the tumor was found to be very dense and intimately blended with the fascia. It contained cyst spaces, some of which were filled with chocolate-colored fluid. The lower portion of the nodule consisted of omentum which had emerged at or near the internal inguinal ring. The histological appearances are shown in Figs. 2, 3, and 4.

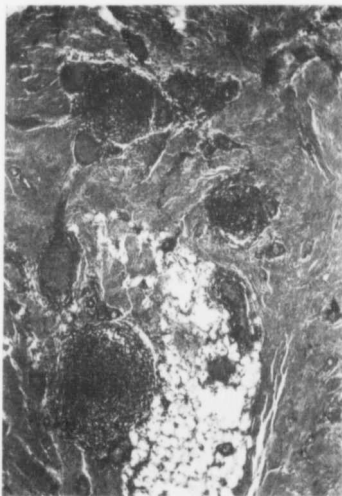


Fig. 2. Apparently discrete myomatous nodules in an adenomyoma of the round ligament, Gyn.-Path. No. 10,018. The greater part of the specimen stains diffusely. It consists chiefly of fibrous tissue and contains non-striated muscle. It will be noted that the adipose tissue at the bottom is being irregularly replaced by fibrous tissue. There are three distinct areas that have a whorled appearance. They form a roughly triangle in the picture. These areas are very cellular, and closely resemble young myomata. They may possibly, however, be very cellular areas of the characteristic stroma that usually surrounds uterine glands.



Fig. 3. Adenomyoma of the round ligament, Gyn.-Path. No. 10,018. The solid portion of the specimen consists of non-striated muscle and fibrous tissue. A little below the center of the field is a gland lined with one layer of cylindrical epithelium. In some places it is separated from the tumor proper by a definite stroma.

Projecting from the surface on the right of the specimen is a dome-shaped mass of tissue very rich in cells with oval nuclei. This tissue is identical in every way with the characteristic stroma of the uterine mucosa. In the lower part it contains a small gland lined with one layer of cylindrical epithelium. The surface of this dome-shaped mass of stroma is covered over with one layer of cylindrical epithelium.

The entire picture is that of a typical adenomyoma. The dome-shaped mass of mucosa evidently projected into one of the cyst-cavities noted macroscopically.

over a considerable area. The adhesions were gradually loosened and the raw area on the bowel was closed. The lumen was not injured. I then examined the omentum and found that it passed down through a hernial opening near the right internal inguinal ring and then directly out into the adipose tissue of the anterior abdominal wall. The omentum was cut off at the internal ring, tied, and pushed out of the way. The extraperitoneal portion of the omentum was left undisturbed. The peritoneum over the internal ring was now closed from within. I then removed the appendix which showed evidence of old inflammation, there being present adhesions passing off from it in various directions.

After closing the abdomen I made an incision over the tumor in the right inguinal region. This

tumor was adherent to the skin. The skin was dissected back and the mass literally cut away from the fascia. There were numerous cysts, some filled with clear contents, others with a slightly turbid fluid, and quite a number with chocolate-colored fluid, strongly suggesting adenomyoma. Adenomyoma was considered probable, some stress being laid upon the declaration of the patient that the lump appeared to increase in size at each menstrual period. After dissecting away the lower portion of the tumor, which was also adherent to the fascia, I now lifted up the omentum from the hernial opening. The hole left near the internal ring was slit-like in form, about 1 cm. long and 4 mm. broad. It was closed with kangaroo tendon. To dissect back the fascia, and do an orthodox operation

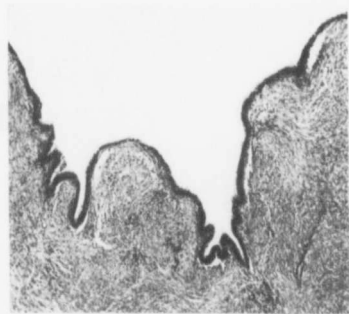


Fig. 4. The lining of a cyst in an adenomyoma of the round ligament. Gyn-Path. No. 19,018. The tumor consists of fibrous tissue and non-striated muscle. The inner surface of this cyst was undulating and had numerous depressions running off from it. These depressions may with equal propriety be described as glands. The cyst is lined with one layer of cylindrical epithelium, which at the more prominent or exposed points has become cuboidal.

was out of the question, because of the large defect that would have been left. At most points good firm scar-tissue existed. I closed the wound with through-and-through silkworm-gut sutures; accurate skin approximation was made with fine black silk. The lower angle of the wound was drained with protective. The patient made a good recovery.

On December 8, 1915, Dr. Trout wrote me, saying that he had just spoken to the patient. She has had no return of the trouble, is free from pain, and has gained twenty pounds.

Gyn-Path. No. 19,018. The outlying portion of the tumor consisted of fat with here and there yellowish or brownish pigmentation, suggesting the pigment of old hemorrhage. The central portion of the tumor closely resembled fibrous tissue. It

had cystic spaces scattered throughout it. The contents of these varied, as noted above, some being clear, others turbid, and some being filled with chocolate-like material.

*Histological examination.* The outlying portion of the specimen consisted of adipose tissue. As one passed toward the tumor, the fat was gradually and irregularly replaced by fibrous tissue, which in many places had undergone almost complete hyaline transformation. Scattered here and there throughout the fibrous tissue were large or small areas of non-striated muscle. Several very small discrete myomata were also noted (Fig. 2). At numerous points in the tumor were glands, tubular or round and lined with one layer of cylindrical epithelium (Fig. 3). Some of the glands lay in direct contact with the fibrous tissue or muscle; others were separated from the tumor by the characteristic stroma of the mucosa. The cyst spaces noted macroscopically were lined with one layer of cylindrical epithelium (Fig. 4).

From the description it is perfectly clear that this was an adenomyoma of the round ligament associated with a large amount of fibrous tissue. From a clinical standpoint the coexistence of a small inguinal hernia with incarcerated omentum and an adenomyoma of the round ligament is very interesting. The increase in size of the inguinal nodule at the period naturally made me suspicious of adenomyoma, and the indications supplied by the presence of old pigment in the fat at operation, coupled with the fact that some cysts contained chocolate-like material, justified a tentative diagnosis that the tumor was an adenomyoma even before the microscopical examination. I have not as yet gone over the recent literature, but do not know of any other case in which an inguinal hernia and an adenomyoma were found in the same hernial protrusion.

Dr. Thomas S. Cullen then spoke on "Endometritis," giving its pathology, symptomatology and treatment. Endometritis, as its name implies, is an inflammation of the mucous membrane of the uterus, and may be divided into the acute and chronic stages. In the gross appearances in the acute form, the mucosa is usually covered with a grayish-white exudate composed chiefly of pus, and the mucosa itself presents a slightly granular surface; is red and injected.

On histological examination of such a uterus the exudate covering the surface of the mucosa is found to be composed chiefly of polymorphonuclear leucocytes or pus cells. The epithelium covering the surface of the mucosa is swollen and somewhat distorted, and may at times proliferate, resembling squamous epithelium. Again, the epithelium may increase in such a way that new glands are formed on the surface. This condition is rare. Between the epithelial cells are many pus cells and a few small, round cells. The uterine glands are usually normal in number and have an intact epithelium, but that near the mouths of the glands is somewhat swollen, and between the epithelial cells are many pus cells; these are also numerous in the gland cavities. The stroma of the mucosa—in other words, the tissue between the glands—shows considerable dilatation of its blood-vessels, and in the superficial portions is freely infiltrated with polymorphonuclear leucocytes. Such is the picture found in acute endometritis.

In chronic endometritis the mucosa is slightly granular, and in rare instances is gathered up into polypi, producing the so-called polypoid endometritis. On histological examination of the mucosa in the chronic form the surface epithelium is usually intact, but instead of being of the high cylindrical form, is cuboidal, or spindle-shaped. The glands are usually small, but some are dilated and their epithelium is flattened. This is due to the constriction exercised by the newly-formed connective tissue. The stroma of the mucosa shows much small, round-cell infiltration, but the polymorphonuclear leucocytes have to a great extent disappeared.

In those cases where the polypoid condition is found the tips of the polypi are covered by one layer of epithelium and the stroma consists almost entirely of small, round cells.

Between the acute and chronic stages all transitions can be traced. The term glandular endometritis is a most im-

proper one, and one is led to believe that the glands take an active part in the process, but as we have seen the gland elements play an entirely passive role the term glandular endometritis should be abandoned. Endometritis is supposed to be of very frequent occurrence, but Cullen has carefully studied the results in 1800 gynecological cases in the Johns Hopkins Hospital and only found endometritis forty-nine times. The mucosa has been studied in every case where the uterus has been removed or where scrapings were taken, and included many cases where the uterus was removed on account of myomata or where there were double pus tubes. He found that even where there was marked *pyosalpinx* on one or both sides that the uterine mucosa was frequently perfectly normal. This is at first sight difficult to explain, as the inflammation has in all probability extended to the tubes from the uterus. When the tubal mucosa becomes involved the fimbriated extremity is occluded and the pus accumulates, finding no exit. The uterine cavity, on the contrary, forms a ready avenue of escape for the pus from the uterine mucosa, as with the uterine cavity almost perpendicular the drainage is ideal; hence it is readily seen how the mucosa may have regained its normal or comparatively normal condition before the uterus is removed.

The question is naturally asked, why do so many speak of this or that case being one of endometritis? We all know that an offensive leucorrhœal discharge is frequent, and naturally infer that the patient is suffering from endometritis. It must, however, be remembered that we are dealing with a mucous membrane where it is normal for the blood to escape once each month. On histological examination we find a ready explanation for the facility with which the blood pours out, namely, in the fact that the veins in the mucosa have merely a layer of endothelium separating them from the stroma of the mucosa. In patients with a lowered vitality all have frequently noted the presence of a leucorrhœa, and have been surprised to see that it disappeared without treatment as soon as the patient regained her usual strength. There has in these cases been a temporary escape of the white blood corpuscles from these venous sinuses which are so prone to allow of the escape of the red blood corpuscles. Endometritis cannot be positively diagnosed without the aid of the microscope. The treatment consists in dilating and curetting the uterus. Dr. Cullen exhibited several drawings of the gross and histological changes found in endometritis.

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OF  
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