CIHM
Microfiche
Series
(Monographs)

ICMH
Collection de
microfiches
(monographies)

Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

- [ ] Coloured covers/ Couverture de couleur
- [ ] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [ ] Bound with other material/ Relié avec d'autres documents
- [ ] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

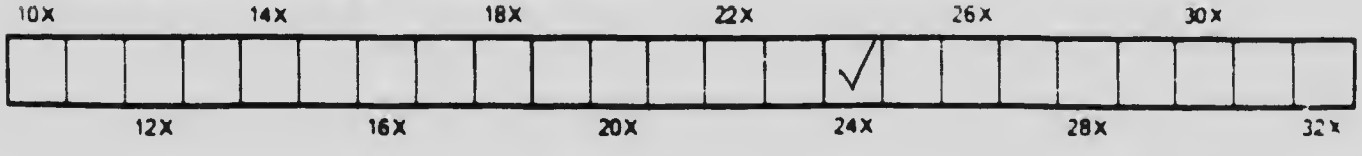
- [ ] Coloured pages/ Pages de couleur
- [x] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [ ] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [ ] Quality of print varies/ Qualité inégale de l'impression
- [ ] Continuous pagination/ Pagination continue
- [ ] Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- [ ] Title page of issue/ Page de titre de la livraison
- [ ] Caption of issue/ Titre de départ de la livraison
- [ ] Masthead/ Générique (périodiques) de la livraison

- [ ] Additional comments:/ Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.



With the Author's compliments.

1. A Case of Fusiform Dilatation of the Œsophagus without Intrinsic Stenosis.

2. A Case of Œsophagotomy for Foreign Body.—*Recovery.*

Illustrated.

BY

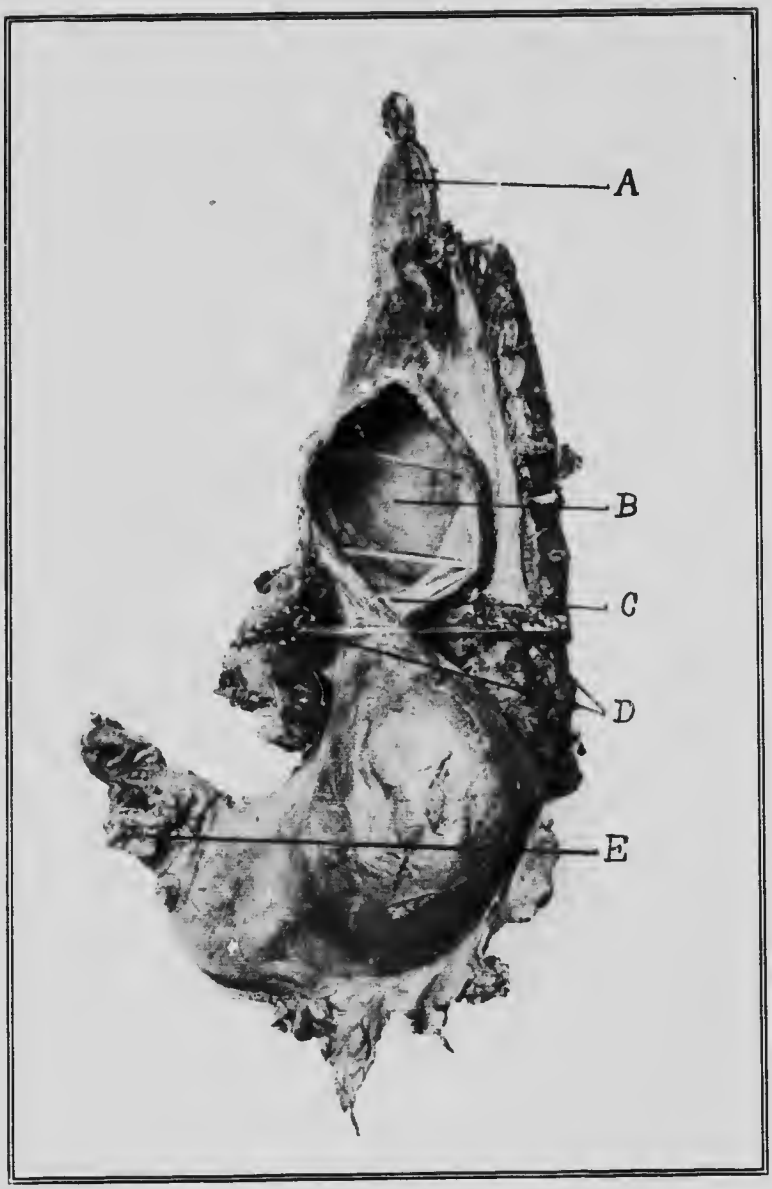
GEORGE A. PETERS, M.B., F.R.C.S. Eng.

Associate Professor of Surgery and Clinical Surgery, University of Toronto; Surgeon, Toronto General Hospital; Surgeon, Hospital for Sick Children; Surgeon, National Association for Consumption.

TORONTO:

REPRINTED FROM THE MARCH CANADA LANCET

1901



THE CANADA LANCET.

DILATED OESOPHAGUS.

(ILLUSTRATING DR. PETERS' PAPER.)

A. Upper portion, about the region of the cricoid cartilage. B. The widest part laid open. C. is placed just above the point where the œsophagus passes through the diaphragm. D. The hypertrophied crus of the diaphragm, divided and held apart by a glass rod. E. The gastrostomy wound, about two inches from pylorus.

1. A CASE OF FUSIFORM DILATATION OF THE OESOPHAGUS WITHOUT INTRINSIC STENOSIS

2. A CASE OF OESOPHAGOTOMY FOR FOREIGN BODY. - RECOVERY.

By GEORGE A. PETERS, M. B., F. R. C. S. Eng.

Associate Professor of Surgery and Clinical Surgery University of Toronto; Surgeon, Toronto General Hospital Surgeon, Hospital for Sick Children; Surgeon, National Association for Consumptives.

THE case from whom the specimen which is the basis of this article was removed, was a farmer aged 35 years, referred to me by Dr. S. T. Rutherford of Listowel, to whose careful observation and clincal acumen, I am indebted for the following history. The family history is free from taint of cancer. There is, however, a history of some degree of neurosis, early on the mother's side. The personal history is that of a hearty, well-developed and well-proportioned man, a farmer by occupation and a very hard-working man. He was always in the habit of eating rapidly, and then going immediately to work. Until the age of about 30 years he experienced no trouble in swallowing and the history of difficulty in deglutition which follows, dates from December, 1896, when he first came under Dr. Rutherford's care. For a short time previously, he had noticed that he had occasional attacks of regurgitation of food and liquid after meals. This condition persisted with fluctuations in intensity for four or five years, gradually, however, becoming more marked. He noticed that the food which regurgitated was not sour in taste but somewhat sweet, apparently due to the fact that it had been acted upon by the saliva, but had not come in contact with the gastric juice. The eructation was not exactly an act of vomiting, but a gulping, regurgitating act It would sometimes be accompanied by marked hiccough. He observed that on some occasions after partaking of a solid meal, the ingestion of a cup full of fluid, such as milk or tea, would carry the whole meal onwards to the stomach and thus obviate the regurgitation. This, in fact, was his habit of eating for many months. On the contrary, on some occasions the swallowing of the liquid seemed to stimulate or excite the act of regurgitation, and the whole meal would then be rejected. The latter condition gradually became more marked, until finally he found it impossible to cause the food by any method to reach the stomach. He was sometimes troubled very considerably with hiccough, and the whole history of the case would appear to point to a spasmodic element in the disability in regard to swallowing. Recognizing this element, Dr. Rutherford exhibited the bromides in full doses, and on the further advice of the late Dr. J. E. Graham, who suspected that there might be pressure of enlarged mediastinal glands on the oesophagus, he also had a full course of the iodides. The bromides, when given in full doses, gave

more relief than any other drug, thus serving to substantiate the view that there was a spasmodic element in the causation. The patient noticed that while taking the bromides, his hiccough was less marked than under the iodide treatment.

During the last year and a half he gradually lost flesh to the total amount of some 50 or 60 lbs and had, of course, become correspondingly weak. Latterly his weakness had been such that he had found it necessary to give up work altogether, and when in that weak condition in September, 1900, he was prostrated by an attack of typhoid fever. This still further reduced his condition and swallowing became impossible, so that had rectal feeding not been resorted to, he would undoubtedly have died at that time. On the subsidence of the fever he was fed for a time by the stomach through a tube which his physician was able, after some manipulation, to pass. Dr. Rutherford at that time recognized a dilated oesophagus, capable of containing nearly a pint of fluid.

As soon as the fever abated, he was placed in the hospital, under the care of Dr. Howitt. of Guelph, who preformed a gastrostomy, making an opening near the pyloric end of the stomach (Fig 1 E), but making no attempt in the then weak condition of the patient to ascertain the state of the oesophagus. The gastrostomy was followed by most gratifying success. He could take food by the fistulous opening and retain it well in the stomach. It seemed to digest perfectly, and in the course of some three or four months he increased in flesh up to his original weight.

After being fed through the gastrostomy opening for some six months, he began again to go down hill, and became nervous and extremely anxious to have something done to allow him to partake of food in the natural way. With this purpose in view, he, on Dr. Howitt's suggestion, placed himself under my care in the Toronto General Hospital.

On passing an œsophageal bougie no obstruction was found until the bulb had passed some 16 inches from the front teeth. Here the passage was abruptly interrupted, though the bulb was not grasped to any extent whatever. Occasionally, however, the bulb could be made to pass onwards to a distance of nineteen inches, apparently entering the stomach. But I was never able to feel the bulb of the bougie by means of a sound passed through the gastrostomy wound. This must have been, as I found out later, due simply to the fact of accidentally missing the bulb, for it is quite clear that the two instruments must have been in the same cavity. The stomach was fairly large, and this probably accounted for the ease with which the two instruments missed one another.

Before operation my conception of the condition was that there was an hour-glass contraction of the stomach, the oesophagus communicating with the left compartment, while the gastrostomy wound communicated with the right. This view seemed to be substantiated by the fact that

liquid coloured with methylene blue to the amount of more than a pint could be swallowed and yet could not be recovered through the gastrostomy wound. It turned out afterwards, of course, that the blue liquid swallowed remained in the oesophagus and never entered the stomach at all, as it would after a short interval be returned by an act of easy vomiting, or regurgitation.

In March, 1901, I made an opening parallel with the margin of the costal cartilages on the left side, through the rectus muscle, and entered the abdomen. By means of a sound passed through the gastrostomy wound, I very quickly found that my diagnosis of hour-glass contraction of the stomach was an error, and that the sac which contained the fluid was situated above the diaphragm. The oesophageal bougie passed by the mouth under an anaesthetic, could not be felt with the fingers in the abdomen outside the stomach. Accordingly a small opening was made in the stomach and the finger introduced. The stomach wall felt smooth, and it was only after a prolonged search that the oesophageal opening was found. It seemed to lie close to the aorta, rather to its right side, and was so small that only the tip of the index finger could be made to enter it. With the finger in that position the aorta seemed to be beating directly against its left side, and gave me the impression that the oesophagus passed through the same opening in the diaphragm as the aorta but to the right of that vessel. This was subsequently disproved so far as the common opening was concerned, by post mortem examination, as it was found that the right crus of the diaphragm passed between these two tubes in the normal manner, but that the oesophageal opening had been dragged quite to the right of the middle line by the weight of the oesophageal sac pouching into the right pleural cavity.

An oesophageal bougie was now passed by the mouth, but could not be felt to come in contact with the finger in the cardiac opening of the oesophagus. On withdrawing the finger from this opening, however, and exploring the neighborhood, the end of the bougie could be felt distinctly to the right of this opening through the stomach wall and the diaphragm. After considerable manipulation the bougie was directed towards the oesophageal opening, and passed on into the stomach. The bougie was now directed by the finger across the stomach cavity towards the gastrostomy wound and made to emerge there. A silk thread was tied to it, and to this in turn a length of small rubber tubing, which was thus withdrawn across the stomach through the cardiac opening and so upwards to the mouth. My intention was to endeavour to dilate the stricture by slow traction by means of this rubber tube, adopting to some extent the string-saw method of Abbe.

The operation wound in the stomach was now stitched up by a double row of Lembert sutures, the stomach dropped back, and the abdominal wound closed after disinfection, without drainage.

The operation was a prolonged and somewhat severe one, and the patient suffered greatly from shock. He died within eight hours of the operation, apparently from exhaustion and failure of the circulation.

Post Mortem Examination.

On opening the chest wall the oesophagus was found lying pouched towards the right pleural cavity. It still contained some fluid, and looked as large as the sigmoid flexure of the colon. On removing the right lung, it was seen that the dilatation extended from the pharynx to the oesophageal opening in the diaphragm, being considerably larger below than above and terminating in an abrupt manner just above the diaphragm. The diameter of the dilated oesophagus at its upper end (Fig. 1 A) in the recent state was about two inches, while at a point an inch and a half above the diaphragm (Fig. 1 B) where the dilatation was greatest the diameter was a little less than three inches. The coats were exceedingly muscular, but taking into consideration the great dilatation did not display a thickness that would indicate hypertrophy. The relation of the oesophagus to the opening in the diaphragm was of very peculiar interest. Even after death it was with difficulty that the little finger could be passed through this opening and the stricture was clearly extra-oesophageal and due to the tight clasping pressure of the pillars of the diaphragm at this point. The inner lining of the oesophagus was perfectly soft and smooth here as well as throughout its whole length. There was no sign whatever of intrinsic stricture, either malignant or non-malignant. Nor was there any scarring. The pillars of the diaphragm, however, were exceedingly strongly developed. The left crus, supplemented by that portion of the right which crosses between the oesophageal and aortic openings was particularly strongly developed (Fig. 1 D.) and was not less than five-eighths of an inch in thickness at a point opposite the oesophageal opening. It is quite clear that the tension during contraction of this portion of the diaphragm, particularly if of spasmodic character, would exert a very powerful influence in obliterating the lumen of the oesophagus. In fact, the action of the two crura of the diaphragm upon the oesophagus when in a state of contraction might be compared to the action of a dull, loose-jointed pair of scissors on a rubber tube, viz., to produce a sudden kinking of the oesophagus at the point where it passed between these two muscular bands. The whole diaphragm was an exceedingly strongly developed muscle, and, in fact, presented a body of muscular tissue far in excess of what must be looked upon as normal. One may, perhaps, even go farther than this, and point out that the obstruction was not, at all events in the later periods of life, merely spasmodic but of such a character that, even in a passive condition, these muscular bands were such as to produce a marked stenosis of the oesophageal opening (Fig. 1C). This was recognized, as above pointed out, during the operation, when it

was found that it was with difficulty that the tip of the index finger could be inserted into it, and moreover, also at post mortem examination, when it was found that the little finger could scarcely be passed through this opening. It is, to my mind, quite clear that the stricture in this case was due to the hypertrophied condition of the pillars of the diaphragm, with or without a degree of spasm in this muscle. Moreover, Professor J. J. Mackenzie found on examination of a section of the esophagus at the point of constriction that there was no cicatricial tissue whatever, and that the circular muscular fibres seemed to be mechanically accumulated but not hypertrophied. The causative relation of the pillars of the diaphragm to the stenosis is further attested by the fact that after their division the index finger could with ease be passed from the oesophagus to the stomach, up to the second joint.

Remarks.

The dynamics of swallowing in a case of this kind affords an interesting subject for speculation. Ordinarily in a case where a muscular effort is opposed by mechanical obstruction, hypertrophy of the muscle takes place, and thus the effect of the obstruction may be entirely overcome. But here the hypertrophy is unequal to the task, dilatation takes place, and when that stage has been reached the problem is an entirely different one, because the muscular contraction, taking the form in this instance of a peristaltic wave, is unable even at its height to entirely obliterate the lumen of the viscus. Accordingly, instead of forcing the column of food and liquid ahead of itself, the peristaltic wave now merely travels upon the surface of this column which, at the moment of passage of the wave, is of course lessened in diameter. The result is, that the food and liquid instead of being forced strongly against the obstruction merely rush strongly backwards, or regurgitate, beneath the peristaltic wave and re-accumulate in the upper part of the dilatation.

Taking the instance before us, it is quite clear that this must have been the case, otherwise food must have entered the stomach, since there was really no absolute obstruction, as the tip of the finger or a bougie properly directed could at all times be passed through the opening from the oesophagus to the stomach. Practically, then, after a certain stage of dilatation has been reached, the condition appears to perpetuate itself, and the increasing weight of the column of food and liquid which may be contained in the dilated portion merely tends the more strongly to bring about a passive dilatation. Moreover, it must not be forgotten that there is a negative pressure in the thoracic cavity through which this portion of the oesophagus passes and this still further tends to favour the dilatation. Again, in the case above cited, it was perfectly evident that the presence of the heart and pericardium crowded the dilated oesophagus towards the right pleural cavity and caused a distinct curve of the tube

in that direction. This again would still further increase the stenosis at the point of passage of the esophagus through the diaphragm by tending to cause a sharp kink of the tube at that point.

The literature of the subject has been comprehensively reviewed in an article by Dr. H. Strauss, of Berlin, Germany, which formed the subject of a lecture and demonstration at the Nineteenth Congress of Internal Medicine at Berlin. Among the theories given to account for the condition may be mentioned the following:—

1. Congential weakness of the oesophageal wall as urged by Strümpel.

2. Abnormal relaxation or elasticity of a Mehnart's oesophageal entromere.

3. Pressure of the aorta upon the lower portion of the oesophagus, leading to a slight degree of stagnation which, it is argued, sets up repeated irritations of the mucous membrane which lead to spasms of the cardiac region of the oesophagus.

4. Strümpel considered that in his case a bend of the oesophagus in its lower portion had impeded the passage of the oesophageal contents.

In the transactions of the Pathological Society of London, Vol. 39, p. 103, Handford reports a case of dilatation of the oesophagus without stricture. The history given is similar to that given above as regards the difficulty of swallowing and the regurgitation of food, but differs in regard to the cardiac symptoms and the mode of death. The seat of obstruction in this case was exactly at the point where the oesophagus passes through the diaphragm, and it is noted that there was no intrinsic stricture of the oesophagus, since the opening would readily admit the finger. There was no induration or thickening which could point to a cicatrical condition or new growth. It is noted, however, that the aorta was dilated to some extent, and the cause of the obstruction is attributed to the pressure of the oesophagus against the unyielding central tendon of the diaphragm by the dilated aorta. The condition of the diaphragm itself is not noted, nor is there history of hiecough, as was present in my case, but it seems to me possible that the fault here may have been primarily in the diaphragm, since it is difficult to understand how simple dilatation of the aorta could produce such an effect upon the oesophageal opening through the diaphragm.

I have above given my reasons for holding the diaphragm responsible, in this case, for producing an extrinsic stenosis of the oesophagus, probably primarily as a spasmodic condition but subsequently passing on to an organic lesion due largely, if not altogether, to hypertrophy of the pillars of the diaphragm.

2. A Case of Oesophagotomy for Foreign Body.—Recovery.

The case about to be described is that of a patient referred to me by Dr Allen Baines, who furnishes the following history :—

Mr. G. D., aged twenty-six, while swallowing a raw egg dislodged and swallowed a small vulcanite plate bearing one front tooth. This occurred on the 18th July, 1901. The plate lodged just below the level of the cricoid cartilage. The patient experienced great pain and was quite unable to swallow any solid food. A throat specialist, who was called in, made an attempt to withdraw the plate by means of a coin catcher. He was able to locate the plate but not to withdraw it. This was explained afterwards at the time of the operation by the fact that the two lateral horns of the plate, which was an inch and a half in length transversely and fortified at the points by gold tips, became entangled, as it were, in the mucous membrane and muscular coats of the oesophagus, so that any efforts made to draw the foreign body upwards merely resulted in imbedding it more firmly in the oesophageal walls Moreover, the frequent contractions of the oesophagus in efforts to swallow, still further served to imbed the horns. The plate thus came to occupy an oblique position across the oesophagus in such a way that its concavity looked forward, and thus an oesophageal bougie passed readily downwards and failed to locate the foreign body. Had it not been for the patient's sensation one might have thought that the plate had passed onwards to the stomach Its continued presence, however, was detected by means of an X-ray photograph, which showed the plate lying slightly obliquely in the position indicated, at a short distance above the sternal notch.

It thus became evident that no less an operation than an open oesophagotomy would suffice to dislodge the body, and with that end in view Dr. Baines placed the patient in my charge. Accordingly on the 22nd July, assisted by Drs. Baines and Wishart, the following operation was undertaken.

The patient was placed in position, with the shoulders well raised and a sandbag under the neck so as to throw the head somewhat backwards and thus increase the area for operative measures An incision about three inches long was made on the left side of the middle line, corresponding with the anterior margin of the sterno-mastoid muscle. The incision was rapidly deepened, largely by blunt dissection, until the anterior belly of the one-hyoid muscle was reached. This muscle, and the sterno-thyroid and sterno-hyoid muscles were drawn inwards. The lateral border of the trachea could then be felt, and on stretching the wound open the oesophagus could be located immediately behind this. Great assistance in locating the gullet was rendered by an oesophageal bougie with a large bulb, passed into its interior and pressed towards the wound. The foreign body, however, could not be felt. The gullet was separated from its connections to a considerable extent, both anteriorly and poster-

iorly, by blunt dissection, and in this way it became possible to bring its lateral wall almost to the level of the skin before making the opening. The remainder of the wound was then packed closely with iodoform gauze, so as to prevent any discharge which might escape when the oesophagus was opened, from infecting the deep portion of the wound. These two measures, viz.: the free dissection of the oesophagus from its surroundings and the packing of the wound, we regarded as very important measures in preserving asepsis of the wound. An incision was now made upon the bulb in the oesophagus, and the lateral margin of the wound was held by a pair of forceps on each side. The finger was then inserted, and the plate was felt to occupy the position already described, viz.: just below the level of the cricoid cartilage, and so firmly and deeply imbedded in the oesophageal wall that the finger could easily be passed in front of it. This accounted fully for the inability to feel it with the oesophageal bougie, or with forceps passed down from the mouth. A pair of curved forceps were then passed along the finger, and the body grapsed and removed, though not without very considerable difficulty. Great care was taken to catch all the mucos that escaped from the wound in sponges. The wound in the oesophagus was then closed accurately by means of a double row of catgut sutures, the outer row being in the form of Lembert sutures. Having sponged this portion of the wound dry, and disinfected with carbolic acid solution 1-20, the gauze was removed from the main body of the wound and the oesophagus allowed to fall back to its place. The whole wound was then sutured up with deep sutures, applied in such a way as to bring all the deep parts of the wound together and yet allow of their subsequent removal by passing the ends through the skin at each end of the wound and tying them over pledgets of gauze. The skin edges were approximated by a continuous horse-hair suture, and a dry dressing applied after dusting the wound freely with bismuth formic iodide.

The patient was given no food by the mouth for two days, and the wound healed kindly without any swelling or inflam nation. In the meantime the patient was well sustained by rectal feeding.

The sutures were removed on the fifth day, when the wound appeared to be perfectly healed. A day or two afterwards, however, a small area of fluctuation was observed under the wound, and on making a minute opening in the scar a small quantity of purulent fluid escaped. This left a cavity, which however did not communicate with the oesophagus. The abscess discharged for about a week but ultimately closed, leaving but a slight scar.

The patient was allowed liquid food on the fifth day, and shortly afterwards solid food was permitted. He had some slight difficulty in swallowing at first, and a slight degree of hoarseness was present for a short time, but he has subsquently fully recovered the use of his voice and of his powers of deglutition. There is no evidence of any stricture having followed the operation.

102 College St., Toronto.