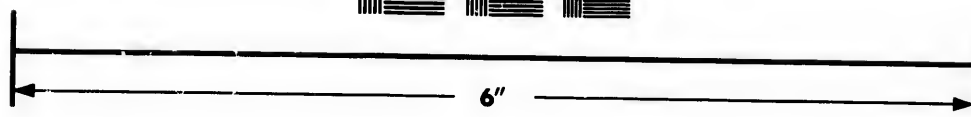
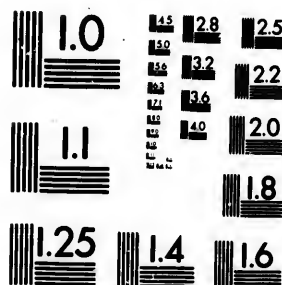


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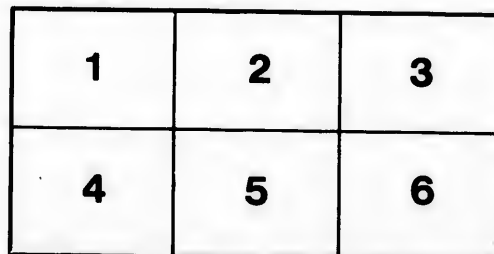
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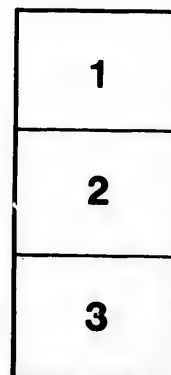
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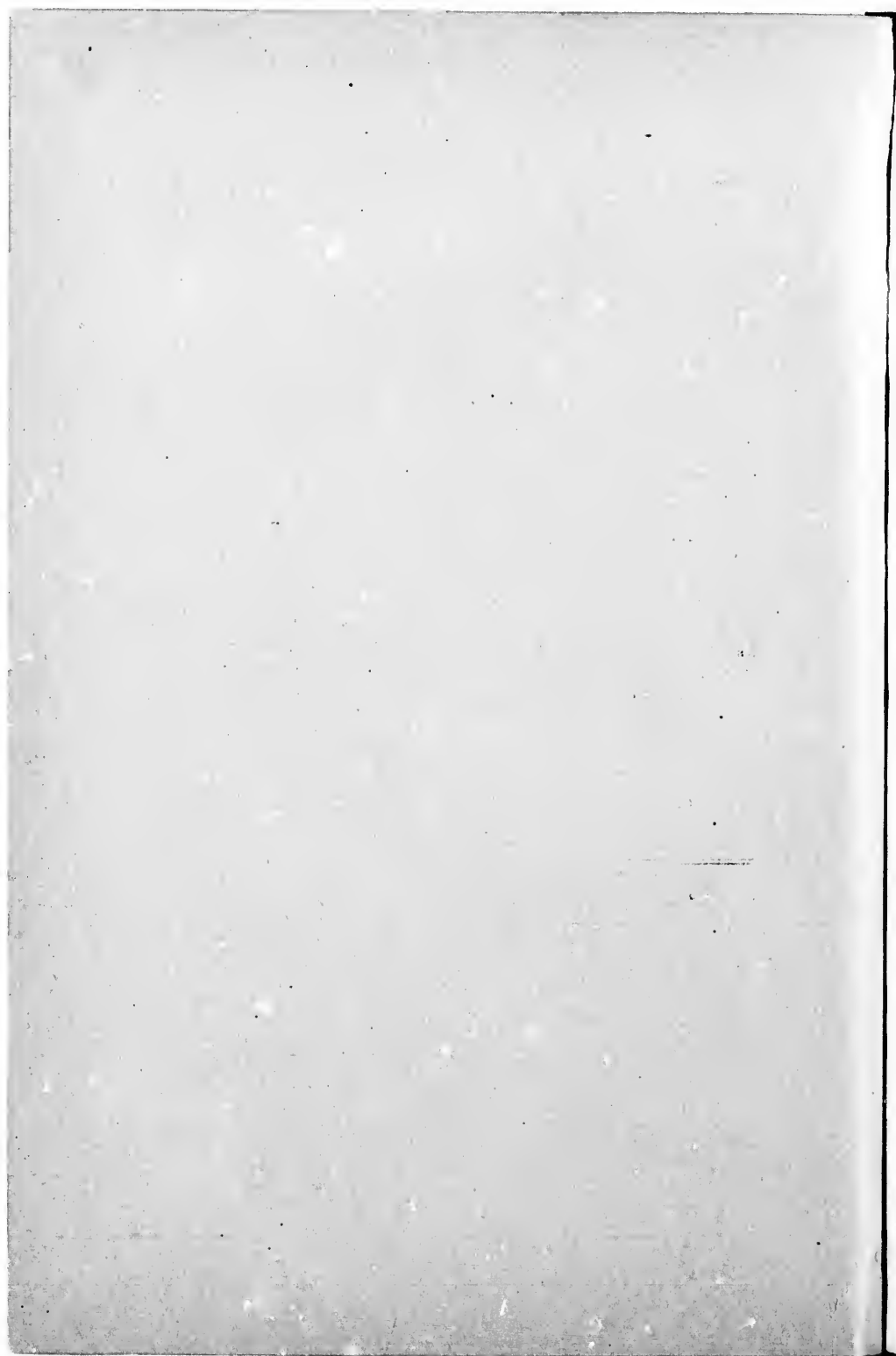
THE SURGICAL TREATMENT OF TYPHOID FEVER.

BY

GEO. E. ARMSTRONG, M.D.,

Associate Professor of Clinical Surgery, McGill University; Surgeon to the Montreal General Hospital, and Attending Surgeon to the Western Hospital; Consulting Surgeon to the Protestant Hospital for the Insane, Verdun.

(Reprinted from the Montreal Medical Journal, February, 1899.)



DISCUSSION ON TYPHOID FEVER.

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I think that the committee that arranged this discussion would have done wisely to have indicated certain features of typhoid for consideration, rather than the whole subject. To do justice at all to the surgical complications and sequelae of typhoid alone would require many meetings, and in the time allotted I can only most briefly refer to some of the most important ones. What I say can only be suggestive, to deal at all fully with any one, this evening, is hopeless.

The bacilli of typhoid can live in the living human body for such a long period of time, and are so widely distributed through the different tissues of the body that evidence of their work is widespread and in many tissues long delayed. Professor Keen has lately published a most valuable work on the surgical complications and sequels of typhoid fever, and from it much that I have to say is taken.

Gangrene.—Under this head I do not include bed-sores, although these sometimes are very much of the nature of gangrene. Typhoid gangrene is rare. Neither Murchison nor Flint met with a case in their large hospital experience. It may occur in mild forms of the fever, and generally late in the course of the disease, or early in the stage of convalescence. It may be due to an embolus from the heart, but more frequently to an autochthonous thrombus. In these cases a pure culture of the typhoid bacillus has been found in the walls of the artery and vein, and in the thrombus. The distribution in the cases collected by Keen is as follows : Ears, 6 cases ; nose, 10 cases ; face, neck and trunk, 47 cases ; anus, 5 cases ; genitals, 20 cases ; legs, 126 cases.

The veins are affected by thrombosis more frequently than the arteries, but the results are, as might be expected, less disastrous.

The preventive treatment consists in the attainment of good hygienic surroundings, the sustaining of the heart by cardiac tonics and stimulants, and the careful avoidance of injuries or any undue pressure upon any part. When gangrene has already occurred it is considered wise

(*Read before the Montreal Medico-Chirurgical Society, Jan. 23rd, 1899.)

to wait for a line of demarkation, and then to amputate. One case of amputation of the legs is reported followed by recovery.

Affections of the Joints.—During the course of typhoid there may occur a rheumatic, septic, or pure typhoid, arthritis. As a rule more than one joint is affected, but in the monarticular variety, the hip is most frequently and seriously involved. While the rheumatic and septic forms of arthritis not infrequently terminate fatally, the pure typhoid joints practically always recover, and ankylosis is very rare.

The distension and destruction of the joint may end in dislocation. I have recently had under my care in the Montreal General Hospital, a young girl, brought in from the country, in whom this serious complication had occurred. The physician who brought her, a most able and careful man, told me that she had lived in a poor, damp house, many miles from his residence, and that he had not been able to secure any nursing other than that supplied by kindly-disposed neighbours. On admission to the hospital she was thoroughly crippled, both hips and both knees had been involved, and the right hip was dislocated on to the dorsum ilii. Most extensive bed-sores, laying bare each hip, and nearly the whole of the sacrum, were almost healed over. The right knee lay fixed across the lower end of the left thigh, and the two legs were flexed upon the thighs. By means of apparatus of one kind or another, the legs were straightened, and when she left the hospital she could stand and walk a little. She was advised to spend some months in the country to recuperate, and then to return to the hospital. I have not seen her since. In this case it seems reasonable to suppose the arthritis to have been partly septic, although perhaps purely typhoid at the onset. The contraction deformities are probably reflex. A knowledge of the occasional occurrence of arthritis in typhoid, should lead the physician to examine from time to time the joints of the body, and particularly the hip joint, to take heed to complaints of pain in the neighborhood of joints, and to carefully relieve painful joints by position, the use of sandbags, and where indicated, to apply moderate extension. If effusion threatens to produce dislocation, the joint should be aspirated under the strictest antiseptic precautions, and if pus is found, which is seldom the case, the joint should be opened and treated according to the indications.

Affections of the Bones.—Keen has collected 205 cases of typhoid bone disease. Bone disease is a late sequel of typhoid, often appearing weeks or even months after the patient has left the hospital. The pain is not generally acute and patients frequently return to the hospital with a discharging bone sinus. These sinuses may have been discharging for months with every opportunity and probability of ordinary pyogenic infection, and yet the pus yields a pure culture of the typhoid bacillus.

It would appear that, while no bone is exempt, yet some are more frequently involved than others. For instance, the ribs were affected in 40 cases; the humerus, in 11 cases; the ulna in 15 cases; the pelvis in 8 cases; the femur, in 22 cases; the tibia in 91 cases; the fibula in 3 cases; and the foot in 8 cases. The extraordinary frequency of bone disease in the lower extremities is noticeable. This may be due to the frequency of injuries, or, as Keen thinks, to their being more distant from the centre of the circulation and where nutrition is more sluggish and its activities most easily disturbed and impaired. The date of onset has been ascertained in 186 cases, and is as follows:—

In the first two weeks, 16.

From the third to the sixth week, 66.

From months to years after the fever, 104.

So that bone disease is more frequently a sequel than a complication of typhoid.

Usually the first symptoms are local pain, tenderness, and swelling. Frequently there is a slow subsidence of the symptoms. Recovery may follow, or the parts may become red and soon after may fluctuate. In other cases, after a slow subsidence, the pain and swelling may reappear. Osler and Parsons refer to excellent examples of such oscillating cases.

The surgical treatment of typhoid bone lesions although often tedious, operative measures being repeated in some cases more than once, is in the end almost always satisfactory. The surgical treatment is generally called for when the patients are fully recovered and their reparative power fairly good. When fluctuation can be perceived, unquestionably immediate operation should be done, and it is still better to operate before fluctuation appears, unless resolution is fairly certain to follow. I have had, in the Montreal General Hospital, some cases of very extensive necrosis of the long bones, which early operation would probably have limited.

In operating upon typhoid abscesses and bone lesions great thoroughness is requisite. The bacilli are found more in the abscess walls than in the pus. If the periosteum is involved, it must be removed and the bone beneath chiselled away. If indications are present that the medulla is involved, the trephine must be used and all the infected area gouged out. Repeated operations are sometimes needed because of the lack of thoroughness in the first instance. Chantemesse relates a case in which, for osteomyelitis, the tibia was trephined three times. No pus was found, but the disease persisted, and the patient was only cured a year later by opening the tibia by an extensive operation, forming a long gutter in the bone. In my own cases I have found at times a mixed infection, and in other cases a pure culture of the bacillus of Eberth. Recently I had to deal with an extensive abscess over the left

parietal, the pus from which gave a pure culture of the bacillus of typhoid. Recovery followed after a free incision with thorough scraping of the soft tissues and a superficial chiselling of the exposed bone.

Passing over, for want of time, typhoid abscesses, typhoid haematoma, the cerebral complications of typhoid, otitis media, and the typhoid affections of the larynx, pleurae, lungs and heart, the stomach and oesophagus, I will speak of intestinal perforation in typhoid.

Perforation of the Intestines.—In 4,680 cases tabulated by Fitz, the mortality from perforation was 6.58 per cent., which may be accepted, therefore, as fairly representing its frequency. It is certainly much more frequent in men than in women, for what reason we do not know. In children it is very rare. Fortunately for the surgeon and the patient, there is generally only one perforation, although two have been reported in 21 cases, and in 2 cases there were 25 to 31. In 81 per cent., the perforation was in the ileum, in 12 per cent., in the large intestine, and in a few instances in the vermiform appendix, Meckel's diverticulum, and jejunum. The greatest number of perforations have occurred during the second, third, or fourth weeks of the fever. The mortality has, up to the present, been very high. It is a debatable point whether perforation of the intestine in typhoid fever ever recovers without operation. Murchison placed the mortality at 90 per cent., and the mortality after general peritonitis had occurred at 95 per cent. With our present knowledge of the results of infection of the peritoneum by intestinal contents, and the experience gained by operators in the uncertainty of the diagnosis of perforation by the most careful and experienced clinicians, one may reasonably doubt the existence of perforation in any case when recovery follows.

There are 89 well-authenticated cases of operation for typhoid perforation recorded, with 17 recoveries, a mortality of 81 per cent., which when compared with Murchison's unchallenged figures of 90 or 95 per cent., may well give us hope for still better results in the future. Keen's analysis of Westcott's table of 83 cases shows some surprising results. Under fifteen years of age there were five cases and two recoveries, or 40 per cent. of recoveries. From fifteen to twenty-five years of age there were 23 cases and three recoveries, or 13 per cent. of recoveries. From twenty-six to thirty-five years of age there were 24 cases and 5 recoveries, or 20.8 per cent. of recoveries. Over thirty-five years of age there were 11 cases, with 5 recoveries, or 45.5 per cent. of recoveries.

These figures show that operation for typhoid perforation of the intestines are more fatal between sixteen and thirty-five than under sixteen and over thirty-five.

A critical enquiry into the cause of this tremendous mortality, which

is far and away beyond that attending perforation of the alimentary canal from other causes, as, for example, perforative appendicitis, perforating gastric ulcer, gunshot and other wounds of the intestine, leads one, in the first place, to consider and try to improve upon our present methods of diagnosing typhoid perforation.

The first and great step in advance is to be made just here. Operations undertaken after a general septic peritonitis has developed, will not be more successful in the presence of the other unfavorable conditions always present in the third and fourth week of typhoid, than elsewhere. To obtain better results in the future than have been attained in the past, operations must be performed earlier, they must be done as soon as perforation occurs, and before the infection has spread.

The signs of perforation are sudden onset of abdominal pain, accompanied by localized abdominal tenderness, and in some cases nausea and vomiting. The pulse may become altered in rate and quality, but not always at first, to a marked degree, and the temperature may suddenly lower. Each of these symptoms must be separately and carefully estimated and collectively considered. They may be masked by typhoid toxæmia and the most careful clinician may occasionally err.

I have operated ten times for typhoid perforation, and in none of my cases was the occurrence of perforation marked by those well-marked, striking symptoms so generally mentioned in text-books. The symptoms often simulate very closely those of perforative appendicitis, even in the right-sided tenderness.

It would seem that the presence of leucocytosis may in the future prove to be a valuable sign of intestinal perforation in typhoid when considered together with the presence and absence of other symptoms. According to Thayer there is no increase in the proportion of white blood-corpuscles during the fever, but rather a slight diminution in their number which gradually diminishes until convalescence. During the fever the number may fall even below 2,000, and sometimes below 1,000 per cubic centimeter. The lowest count seems to be about the end of the third week. Sometimes the white blood-cells increase markedly in number with the fever, even without any complication. Four cases were observed by Cabot in which the count was over 11,000, and ran as high as 17,000, without any other than the typical typhoid lesion. But the effect of complications is very marked and undoubted. Cabot mentions one case of perforation in which five days before perforation the number of white cells was 8,300, and at the time of perforation, 24,000. In another case at the time of perforation the number of white blood-cells was 18,500. The increase of white blood-cells may be almost, if not quite, as great upon the occurrence of phlebitis or otitis media, or the development of a typhoid abscess. General bronchitis and cystitis

have usually no such effects. It seems clear then that it is correct to make an occasional count of the white blood-cells, as a routine practice in typhoid fever, and, if with the development of symptoms that lead to the suspicion of the occurrence of a perforation, the count should be repeated, and if leucocytosis is found present, and other typhoid complications can be excluded, this symptom would justify the assumption that a perforation has occurred. In some cases of profound typhoid toxæmia leucocytosis may not occur.

It would be well in suspected perforation to have a surgeon see the case with the attending physician, and it would be a good hospital practice to adopt Osler's suggestion that the house-surgeon should visit these cases in the wards with the house-physician.

The dangers of surgical interference are unquestionably very great. The following words of Wilson, written twelve years ago, state the question very clearly: "Granted that the chances of a successful issue are heavily against you, that the patient is in the midst or at the end of a long sickness, that his tissues are in the worst state to stand the injuries from the knife, that the lesions of the gut may be very extensive, that the vital forces are at the lowest ebb; no one has yet hesitated to perform a tracheotomy in the laryngeal complications of typhoid fever which requires it to save life, for these reasons. The operative treatment of purulent peritonitis has been performed many times successfully by the gynaecologist in conditions less promising. In point of fact, the objections that may be urged against laparotomy in intestinal perforation in enteric fever are no more forcible than those which would have been made use of at first against the same operation in gunshot wounds of the abdomen. The courage to perform it will come from the knowledge that the only alternative is the patient's death."

I am sorry that I can only count one recovery among my ten cases, and that one was not an ordinary perforation. I will allude to it again. Another of my cases lived over six weeks and ultimately died, subsequent to the occurrence of the third perforation. This young man did well for four weeks after I closed his first perforation. I regarded him as saved, when the second perforation occurred. The incision had not fully closed and the second perforation occurred *in situ*, and the contents of the intestines all escaped externally, and I think that had not a third perforation occurred within the abdomen on the forty-second day after operation, that he would have survived the first two. In one case I opened the abdomen and failed to find any evidence of perforation, only about two feet of completely collapsed bowel, from some cause undiscovered. This has occurred to other surgeons, and only recently a similar case occurred in the Johns Hopkins Hospital. My patient, as well as the one in Baltimore, recovered, the operation apparently having

had no retarding influence on the convalescence. Three points have been conspicuous in my cases:—

1. That in all of them the operation had been too long delayed. In all of them, on opening the abdomen, gas and faecal matter escaped and it was quite evident that a very considerable portion of the peritoneal cavity was already infected.

2. That notwithstanding the poor reparative power of the patient the closure of the perforation in the intestine healed readily, and shortly. At the autopsies performed on these patients, the portion of intestine involved was distended with water and air, and in every instance proved tight, and no leakage was possible.

3. The great lack of reparative power was manifest in the failure of union in the abdominal incision. In the man who lived forty-five days no union occurred, and when the stitches were removed the edges of the incision fell apart. About the twenty-first day after operation, the edges were scraped and brought together by sutures, but again union failed to occur. In the case of the man in whom no perforation was found, the union of the edges of the incision was very imperfect, although not a drop of pus formed. The man left the hospital with a ventral hernia and was directed to return in six months and have the edges again united.

The result of perforation is sometimes a localized abscess, similar to the localized abscess which sometimes follows a perforative appendicitis. My last case was of that character. The man was admitted to the Montreal General Hospital under the care of Dr. Finley. He had been treated in the country for typhoid, and during the course of the fever developed pain, tenderness, and, later, a tumour mass of very indistinct outline in the umbilical region. His condition was a very puzzling one, and it was thought at one time that it might possibly be tuberculous. About a week after his admission to the hospital he developed symptoms of intestinal obstruction, distress, pain and faecal vomiting. I opened the abdomen in the median line below the umbilicus, to relieve the obstruction. Upon opening the abdomen a large quantity of pus escaped, twenty ounces or more. It seemed to lie in a walled-off space in front of the intestines, which were pushed backward and upward. The space was irrigated and drainage provided. During his convalescence he passed some faeces and gas through the drainage tube, at different times. His blood gave the typical typhoid reaction. He has quite recovered and has gone home. He told us that his wife and daughter had enteric fever at the time that he was taken ill. I think there can be little doubt that this was a case of typhoid perforation, followed by localized abscess.

Liver and Gall-Bladder.—Typhoid affections of the liver and gall-bladder are extremely interesting and far-reaching, but the time limit set by the committee prevent me entering upon their discussion.

