"ulcus carcinomatosum" is held to include all cases in which chronic inflammatory conditions are the local precursors and excitants of carcinomatous changes.

It is interesting to note that the two conditions, ulcer and cancer, affect the various portions of the stomach with approximately the same frequency. The "ulcer-bearing area" of the stomach is the pylorus with the pyloric antrum, and it is here that cancer is most commonly found. This part of the stomach is certainly that upon which the greatest stress is thrown during digestion. It is the most muscular part of the stomach, the "grinder" as it has been aptly called, and it is therefore more subject to the pressure and irritation of passing food than any other part of the organ.

DURATION OF LIFE AFTER OPERATION.

Of all the cases, 70 in number, that I have seen, only 1 has survived a period of four years from the time of the discovery of the disease. The records of cancer in any of the organs of the body surgically accessible are saddening enough, but I doubt whether a statement so deplorable can truthfully be made about any of them. Now, it cannot be said that there is anything specially vicious in cancer of the stomach as contrasted with that occurring in other organs. For we know that the *post-mortem* examination of one dead of cancer of the stomach sometimes discloses the fact that the disease has not spread beyond the stomach, that there are no secondary deposits in the liver or elsewhere, and that there is no involvement of other parts, such as the pancreas or colon, by direct extension. The origin and early development of cancer of the stomach are certainly insidious, but the growth is not usually rapid, and the involvement of the parts to an extent which excludes the possibility of removal by operation is probably tardy. What are the conditions, therefore, which make our treatment of the disease so ineffective?

I believe that the faults in our attitude towards this disease lie in two directions. In the first place diagnosis is not made at a sufficiently early stage, and in the second we have too often been contented with merely palliative operations instead of attempting the removal of the growth; and, further, when removal has been undertaken, the operation practised has not been based, as successful operations in malignant disease wherever occurring must be based, upon a knowledge of the anatomy of the organ involved, especially so far as its lymphatic distribution is concerned.

We have heard much in recent years of the problem of the early diagnosis of cancer of the stomach; but, in spite of much labour and much discussion, no significant advance has been made in our power of a timely recognition of the disease. A close study of the history of the patients in my series and in the other records with which I have made myself acquainted leaves me convinced that even with our present methods earlier recognition and radical surgical treatment based thereupon should be far more frequent than at present.

The type-history of a case of carcinoma is as follows: A man or woman of middle age has suffered for a few or for many years from indigestion, pain after food, vomiting, and inability to take the ordinary food in ordinary quantity; these symptoms have, it may be, come on in "attacks," in the intervals of which there has been comparative or complete freedom from suffering. At last an "attack" comes that is more rebellious than the other, vomiting is more persistent, and the loss of weight is unusual. The remedies which before gave relief are now without effect. If in such a patient there be gastric stasis, food being retained for ten or twelve hours, if there be persistent absence of free HCl after a test meal, if lactic acid be present, and if in the test meal when removed blood is found on microscopic examination, then there is a very strong warrant for a diagnosis of carcinoma, and an exploratory operation is not only justified, it is demanded. What I have said already with regard to exploration applies only to the late case: for the discovery of the early condition exploration would be of insignificant risk. In discussing this question of exploration it is well to be clear. There can be no question that an exploratory operation is a confession of diagnostic failure; we do not explore the abdomen for conditions which we can now diagnose with certainty, conditions, it may be, which 20 years ago we were

not capable of recognizing with precision, conditions such as duodenal ulcer or stone in the common duct. But no one would hesitate to say that positive recognition of cancer of the stomach in its early stage—in the stage, that is, when it could be completely eradicated—is, with present clinical methods, almost impossible. If so it should be frankly admitted, and the only certain method—exploratory operation—be vindicated. If the clinical history of a case is such that suspicions created at the first are not quickly allayed, then the abdomen should be opened to enable a diagnosis to be made. Exploration should be used for the purpose of *making*, not with the object of *confirming*, a diagnosis. It is probable that, as in other matters, the comparison of the history and of the conditions revealed at operation will lead by degrees to greater assurance in our diagnosis. Before an exploratory operation is sanctioned, however, the clinical investigation should be as complete as it is possible to make it.

POSTSCRIPT.

Between July 1st and December 31st, 1905, I have in addition operated upon 8 cases of carcinoma of the stomach. Gastro-enterostomy was performed 6 times; all the patients recovered. Gastro-enterostomy, followed by gastrectomy, once, successfully. Exploration once, the patient recovering. In 6 of these the growth was at or near the pylorus, and formed an obstruction to the onward flow of the gastric contents; posterior gastro-jejunostomy was therefore performed. Three cases had already developed secondary growths; in 1 the patient's severe condition rendered the more radical operation unwarrantable, though the local conditions appeared favourable for excision; in 2 the extent of the growth and the number of adhesions prevented, in the patient's bad condition, any radical operation. In one case the gastro-enterostomy was made well away from the pylorus, and on the twenty-fifth day partial gastrectomy was performed. In one case the patient was found to have a growth of considerable extent involving the lesser curvature in its cardiac half, and adherent posteriorly to the pancreas. There being no pyloric obstruction, the abdomen was closed without further interference. This patient died in the tenth week after operation. Of the remaining patients, two have since died, one two months after operation; in his later days he suffered a good deal of pain, owing to the formation of numerous metastases, but to within a week of the end he was able to take food fairly well. The second patient died three and a half months after operation, with jaundice and ascites. The remaining patients are alive and in fair health. The histories of four patients suggest the previous existence of an ulcer, upon which the terminal disease was engrafted.

In my first series of cases I have omitted to mention one case of carcinoma of the stomach in which perforation occurred. The opening was closed by suture and a flap of omentum stitched over; gastro-enterostomy was then performed. The patient recovered and is still living, eighteen months after the operation. He has now jaundice and ascites.

REFERENCE.

¹ *Practitioner*, September, 1904.

ON THE TREATMENT OF PERFORATING TYPHOID ULCERS.

BY FRANCIS L. A. GREAVES, F.R.C.S.ENG.,
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A RECENT editorial article in the *BRITISH MEDICAL JOURNAL* having called attention to the prognosis and treatment of perforating typhoid ulcers, I have determined to record two cases which have come under my care, with a reference to a third case which came under my observation for a short time.

CASE I.

F. W., female, aged 5 years, under the care of the late Dr. Milnes at the Derbyshire Royal Infirmary, admitted on the ninth day of disease. A sister was already an inmate suffering from the same complaint. I was asked to see the case on the fifteenth day of disease, perforation having taken place, as evidenced by a sudden attack of vomiting, collapse, and subnormal temperature about eight hours previously.

When seen the patient had rallied, and immediate operation was advised. On opening the abdomen, a large amount of clear fluid with flakes of lymph on the surface was set free. There was much lymph adherent to the coils of intestine near to the ileo-caecal valve, and a perforation was rapidly demonstrated in the lower end of the ileum in the midst of an intensely inflamed Peyer's patch. The perforation was quite small, and was quickly closed by four or five fine Lembert sutures. The engorged and indurated tissue, together with the sutured perforation, was invaginated and the approximately healthy peritoneal coats which formed the boundaries of the furrow so formed in the long axis of the bowel were sutured by eight or nine fine Lembert sutures. The peritoneal cavity was then thoroughly and deliberately sponged out with sterilized swabs, but not irrigated. The abdominal incision was closed by a single layer of "through and through" medium silkworm-gut sutures. No drainage tube was used. After the operation the patient was very collapsed, but quickly rallied, and all went well until the third day, when a rise of temperature caused an examination of the wound to be made. It was then found that suppuration was taking place in the wound, but there was no evidence of general peritonitis, the abdomen being not distended, and abdominal respiratory movements well marked. Eventually the whole abdominal incision gaped, and adherent coils of intestine could be seen. With frequent dressing the wound cleaned up and commenced to heal by granulations, and for the ten days following operation all went well. On the tenth day, however, the patient had haemorrhage from the bowel, and on the following day passed a blood clot. About this time a cough developed, and on the fifteenth day following operation dullness at both bases was found, and moist sounds heard. Signs of bronchopneumonia were well marked on the seventeenth day, and she died on the twenty-third day following the operation—that is, the thirty-eighth day of disease.

CASE II.

For the following history of my second case I am indebted to Dr. Bull, of Ashbourne, Derbyshire:

H. B., female, aged 5½ years. Had an attack of enteric fever in July. Fever lasted about four weeks, and the temperature, which had reached 104° F., became normal on August 12th. Constipation was a marked feature, and there was a good deal of colicky pain.

On August 18th temperature began to rise, and reached 104.6° F. on August 22nd. It then gradually declined to 100.8° F. on the evening of August 30th. Constipation was still extreme, necessitating daily enemata.

On August 31st she was seen at 10 a.m., complaining of pain on the left side of the abdomen. Temperature 98° F. A glycerine enema was ordered. At 11.45 the following symptoms were noticed: Patient awoke suddenly with acute pain, sickness (a little frothy mucus being brought up); collapse, temperature 97.6° F., falling to 97° F.; feet and hands cold; eyes sunken; lower part of abdomen not moving; no distension, but absence of liver dullness; pulse 180; pain all over abdomen, especially on the right side; aspect of acute abdominal illness; no signs of free fluid in abdomen. No more food was given by the mouth, and attempts were made to combat the shock. An hour later the patient had rallied; extremities were warmer. Pulse 160, temperature rising. At four o'clock I saw the child. She then lay quiet, with no expression of distress visible in the face; respiration very quiet; lower abdomen scarcely moving; no distension of abdomen, but gentle palpation elicited some pain, especially in the hypogastric region. On percussion a rather high pitched note was obtained all over the front of the abdomen, the liver dullness being completely obliterated. A small amount of shifting dullness was found in the flanks.

Operation.

Immediate operation was decided upon, and half an hour later chloroform was administered by Dr. Boswell, and, assisted by Dr. Bull, I opened the abdomen. A large amount of gas escaped on opening the peritoneal cavity, followed by a small quantity of clear fluid, through which bubbles of gas were seen coming from the left iliac fossa, and, by rapidly tracing the coils of small intestine in this direction, a small perforation was discovered. The rest of the intestine which had been exposed was swabbed over with sterile water and replaced, and the ulcer invaginated and sutured by eight or ten interrupted Lembert sutures. The whole gut was then replaced and the wound sutured by "through and through" silkworm-gut sutures. No irrigation was performed and no drainage tube inserted. The operation lasted twenty-five minutes. The patient stood the shock well, and was given ½ gr. of strychnine hypodermically. Pulse 150.

After-treatment and Progress (Reported by Dr. Bull).

Saline enemata 4 oz. every four hours, and occasional teaspoonfuls of sterilized hot water by the mouth were administered for the twenty-four hours following operation. Sugar was added to the enemata after twenty-four hours, and beef-tee after forty-eight hours.

September 1st. Temperature 97° to 98°, pulse 124, respirations 26. Abdomen used only slightly in respiration. Some pain at night. Aspect improved.

September 2nd. Bowels open and flatus passed naturally. Temperature 97° to 97.5°, pulse 108 to 112, respirations 24.

September 4th. Ol. ricini.

September 8th. Ol. ricini.

September 9th. Dressed wound. Some beads of pus from the four lower stitch-holes. No gaping of wound when three alternate stitches were removed.

September 11th. Dressed wound. Remaining stitches removed.

September 18th. Healed firmly. No sign of bulging. Patient is still very constipated, and has a good deal of colicky pain at times. Is taking a mixed diet of chicken, fish, etc.

Ten days later Dr. Bull wrote to me to say that the patient had an evening rise of temperature, normal in the morning. No pain, headache, cough, sickness, and no physical signs. Is still very constipated, and is hysterical at times. I suggested that it might be due to some toxæmia from the bowel, but thought a careful watch should be kept lest a residual abscess was forming. However, the temperature became normal again, and the patient has been quite well since. She was taken out of doors for about ten days before the temperature became normal. It is now five months since the operation.

CASE III.

Operated upon by Mr. Thurston at St. Thomas's Hospital. In this case the wound suppurated and an incisional hernia developed. The patient had double acute parotitis and thrombosis of one femoral vein. Complete recovery eventually took place.

Reported cases of recovery after perforation of a typhoid ulcer are sufficiently rare to justify a few observations being made.

Prognosis.

From a statistical point of view this complication, which is by no means uncommon (it occurred in 114 out of 2,000 Munich cases, that is, 5.7 per cent., and in 20 out of 80 cases under Dr. Osler), is exceedingly grave. The perforation generally takes place at the end of the second or during the third week of the disease. It is necessary to remember in giving a prognosis that the patient is still suffering from typhoid fever with its manifold possibilities in the way of complications. In my first case perforation took place on the fifteenth day of the disease, and the progress of the abdominal section was complicated by further manifestations which may fairly be attributed to the original disease; then, although there was no general peritonitis, and the local suppuration of the abdominal wound was readily dealt with, the patient suffered from fever more or less severe to the end. Diarrhoea and haemorrhage from the bowel also took place, and the low form of pneumonia which proved fatal is a frequent termination of typhoid cases where no perforation has occurred.

In my second case, on the other hand, the disease had run the fairly typical course of a mild case of typhoid, until the so-called relapse after normal temperature of a week's duration. The pathology of this "relapse" is rather obscure. That it was not due to a fresh invasion of the typhoid bacillus is, I believe, certain. The complete and sudden disappearance of all signs of toxæmia for the three weeks following the operation could not occur if a fresh infection by the typhoid bacillus had taken place. It is possible that absorption from an ulcerated Peyer's patch was taking place, and that the operation, by placing this ulcer in some such mechanical position that its surface was well drained, and also by causing irritant food particles to cease from passing over its surface brought the absorption to an end. Whatever the explanation may be, the change in the patient's aspect was most remarkable. I have recently seen a case of typhoid fever where the temperature had become normal about the fourth week, and after a few days began to rise again. The elevation of temperature was accompanied by inflammation, and eventually suppuration of a parotid gland. After this was opened the temperature dropped and the patient rapidly recovered. The aspect of the patient reminded me very strongly of that of my second case after operation. Late perforation, although rare, is mentioned by Dr. Osler as having occurred in the sixth week in one of his patients, the temperature having been normal for fourteen days. He does not say what was the treatment or result, but it would seem to have been a case in which a good prognosis might be given.

To sum up. A perforation occurring early in the disease, necessitates a guarded prognosis owing to the complication of the abdominal section with the natural course of the fever. A perforation occurring in a true relapse, by which is indicated a fresh invasion of the typhoid bacillus,

is very grave; but a perforation, occurring in what may be called the convalescent period, is much more favourable.

Diagnosis.

In these days it is nearly approaching a platitude to insist that an early diagnosis must be made in order to operate successfully in such cases.

If the patient has been under close observation the diagnosis is not often very obscure. If mental symptoms have been a prominent feature of the case it is possible that the signs of perforation might be overlooked. But the low temperature and collapse even in these cases will generally lead to a correct diagnosis.

The patient complains of abdominal pain; retching and vomiting ensue, quickly followed by a state of collapse; there is a sudden fall in temperature (104° to 97° in one of my cases), the extremities are cold, the pulse becomes very rapid and thready, the respirations are short, rapid, and shallow, the face looks pinched and anxious. Examination of the abdomen will show that the abdominal walls are held rigid, respiratory movements being absent. Some general tenderness is elicited on palpation. On percussion, a tympanitic note from free gas in the peritoneal cavity may be obtained over the abdomen, and the liver dullness may be encroached upon or obliterated. Too much stress must not be laid on this sign, as extreme tympany may almost obliterate the liver dullness.

If, however, the patient is not seen until reaction has taken place, the diagnosis is more difficult. Especially is this the case if any opium has been given. Here a careful history of the sequence of events must be elicited, because the patient no longer looks pinched; the pulse, respiration, and temperature are better, pain is almost absent, and the friends will probably regard the patient as being on the high road to recovery. Careful examination will show impaired abdominal respiratory movement, possibly some distension, or a tympanitic note, with a variable amount of shifting dullness in the flank. The previous condition of the abdomen as regards distension and the character of the motions must be inquired into. Now is the time to operate with some hope of success. If the surgeon waits until the manifestations of peritonitis become obvious, the favourable opportunity has been missed.

Treatment.

It is not necessary to enter into details on the treatment of the state of collapse, except to again insist on abstention from opium.

Anaesthetic.—Chloroform carefully given is the most comfortable anaesthetic.

Operation.—As rapidity in operating is of the utmost importance, a free incision should be made, good retraction of the edges of the wound, and a good light be available. The perforation is generally readily found, as a rule, in the ileum near to the ileo-caecal valve, sometimes in the caecum itself. The perforation is rapidly closed by interrupted Lembert sutures, invaginated, and then still further buried by another layer of sutures. Having securely stitched up the perforation, the question of dealing with the peritoneal cavity must be considered. There has been much discussion whether irrigation should be used, and, if so, with what fluid should it be performed. The recent work by Dudgeon and Sergeant on the bacteriology of general peritonitis is intensely interesting when considered in reference to this debated question of irrigation. Before reading this work it had become my opinion that irrigation was useless, except in certain cases. If there is not a very general form of peritonitis, irrigation does more harm than good by carrying septic material to regions previously unaffected. If irrigation is used at all it should be thorough, with a long abdominal incision and evisceration, gallons of normal saline being used, and the intestine treated as gently as possible, and, when exposed, covered up with a succession of hot sterile towels. In a late case, where the peritonitis is general and there has been much escape of intestinal contents, such irrigation may be indicated. But far different is it when the case is seen early—the escaped contents are but few, the infected area only local. The wound having been well opened up by retractors, a succession of sterilized wool sponges on holders are rapidly but methodically used to remove the septic material from the coils of intestine near to the perforation, from the regions of the upper end of the right kidney, spleen, iliac fossae. The abdominal wound must

now be closed, and in this connexion another debatable point—that is, that of drainage—must be considered.

The old method of inserting a glass drainage tube from the lower end of the abdominal incision should be abandoned entirely, for the following reasons:

1. The "drain" is acting under the mechanical disadvantage that the patient is lying on his back and all the fluid must pass uphill.

2. Whereas perfect rest is greatly to be desired in any case of general peritonitis, but especially in typhoid fever, the presence of the drainage tube adds to the difficulties of nursing, and must be constantly emptied by a suction syringe.

3. The drainage tube provides an open path for the intrusion of germs from without.

4. The drainage tube, if flexible, is easily occluded, and so rendered useless; if rigid, it may by its pressure injure the intestine or bladder. I have seen a faecal fistula as the result of such pressure.

5. On withdrawing the tube, some portion of bowel—such as the appendix, Meckel's diverticulum, an appendix epiploica, part of the great omentum—may have entered the tube and be withdrawn also.

We now know that the peritoneal cavity is able to deal with far more septic material than was thought possible some years ago. Drainage should be reserved for the most septic cases, and then applied to the dependent parts, such as the lumbar regions, rather than to the abdominal incision. Owing to the escape of septic fluid from the peritoneal cavity infection of the abdominal wound nearly always occurs. This wound should be closed in layers and the sutures should be interrupted. The result is nearly always the same; the peritoneum, rectus sheath, and skin heal, but the subcutaneous fatty tissue becomes infected. It has been suggested that a small drain should be inserted into the wound at the lower end of the incision after the peritoneum is completely closed. While this suggestion is free from many of the objections I have advanced above, personally I much prefer to use interrupted sutures, and remove one when necessary.

After-treatment.

Nutrient enemata of 4 oz. may be given every four hours. Sips of sterilized hot water administered with a horn spoon by the mouth. After forty-eight hours, peptonized milk and beef-tea in small amounts may be taken by the mouth. Gradually the food may be increased, and by the end of the fourth day nutrient feeding may be nearly always discontinued. A flatus tube should be passed if there is pain after the operation, but opium should be withheld. A turpentine enema may be given on the evening of the third day, unless much distension indicates its administration earlier. A dose of castor oil or calomel, 3 gr., either alone or combined with pulv. elaterii co., 2 gr., in capsule, may be given on the following morning.

Convalescence is always protracted, and careful dieting is necessary for some considerable time. A night temperature occurring some weeks after the operation, and without any physical signs, may be due to post-typhoid anaemia (Osler); it should not prevent the patient from being taken out-of-doors, since fresh air and sunshine will expedite recovery more than anything else at this stage.

NOTES ON THE TREATMENT OF DIPHTHERIA.*

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MR. CHAIRMAN AND GENTLEMEN,—I regard it as an honour and a very great pleasure to welcome you this afternoon and to have been asked to read this paper before you. I will preface my few remarks by saying that I am not desiring to speak in any way didactically or dogmatically, but am merely describing as far as possible my own line of treatment in regard to such cases of diphtheria as come under my care, in the hope that what experience I have had in this particular branch of medicine may be of use to some who do not have the opportunity of seeing numbers of cases.

* Read before the Altrincham Division of the British Medical Association on the occasion of their visit to the Sanatorium.