

that is, before some small vessel, probably an arterial twig, was ruptured by the advance of the eroding ulceration. The recurrent bleedings are noteworthy. The first one occurred in spite of absolute rest and absence of all feeding by the mouth; not even a spoonful of water was given. The second one occurred after whey and milk and lime-water had been taken in small quantities, nutrition being maintained by enemata. As this was a more serious hæmorrhage, the question of surgical interference was discussed and arrangements were made for it in case of renewed bleeding. This happily proved unnecessary.

CLASSIFICATION.

Our knowledge in regard to gastric ulceration has been enlarged of late owing to the practice of modern surgery, and we are now able to classify these lesions under three conditions. We formerly recognised by the history and symptoms of gastric ulcers that they were acute and chronic; that some appeared to heal rapidly and gave no further trouble, while others proved rebellious to careful treatment. Inspections of the gastric mucosa on the operation table in some cases of severe recurrent hæmorrhage have revealed a lesion which had no resemblance to ulcer as commonly recognised in the post-mortem room, and conceived as existing beforehand. All that was apparent consisted in a series of small fissures, or chaps, from which blood oozed freely and continuously. Each of these being ligatured with fine thread ceased to bleed, and nothing further remained to be done; recovery followed. This oozing patch was regarded as an erosion, which, indeed, it appeared to be, hardly amounting to an ulcer. Cases of this kind have probably been regarded as instances of gastrostaxis, and we may assume that many of them cease to give trouble and heal kindly under appropriate treatment. We may fairly regard them as examples of a variety of ulceration, if we bear in mind the old surgical definition of an ulcer as a "solution of continuity." Some recent and careful observations by Dr. C. Bolton¹ of University College Hospital have shown that such erosions, although very difficult to find after death, may be detected by certain methods, and should certainly be regarded as superficial ulcers. It therefore becomes a question of degree. I confess that I am of his opinion in the matter. These lesions may be multiple, and it is certain that they are as apt to be serious sources of hæmorrhage as are the deeper ones. Mr. Butlin and I related a good example of this kind to the Clinical Society² in 1903, in which Mr. Butlin operated with advantage, and a rapid recovery followed.

TREATMENT.

The results of cases of gastric ulcer treated carefully in hospitals are, in the great majority, satisfactory, and have led some observers, Dr. W. P. Herringham³ amongst them, to believe that in many of such patients there was probably no true ulceration present, but some much less serious condition. It may be that some of these patients were the subject of minor degrees of the superficial ulcerative erosion I have just described. Mr. C. Mansell Moullin and Dr. F. J. Smith have well described such cases. With regard to a fatal issue in all cases by hæmorrhage, I must add my experience to the effect that this is happily not a common occurrence. Whatever the lesion, or the degree of it, the treatment of the patient is the same, and it consists in absolute rest, recumbency with head low, and morphine given hypodermically. Nothing whatever is to be given by the mouth, not even iced-water or pieces of ice. Saline solution, in half-pint quantities, should be given by the bowel, and nutrient enemata consisting of from eight to ten ounces of peptonised milk, with yolk of egg and grape sugar, repeated three or four times each day for at least three days. The mouth should be cleansed with borax, thymol, and warm water several times a day.

We await the closing of any oozing vessel or arterial twig by clot, and this delicate process must not be disturbed by matters of any kind introduced into the stomach. These are apt to excite secretion of gastric juice which is unfriendly to a sore surface. Even nutrient enemata are apt to excite this secretion, as Dr. E. I. Spriggs⁴ tells us, but the patient must be fed on something. After hæmorrhage, the next grave matter to bear in mind is the possibility of perforation of an ulcer,

with alarming symptoms of pain and collapse, calling for immediate surgical action.

We may note that our patient suffered from some pain after taking small quantities of whey, and it may be that the excess of rennet in this may have acted as a peptic irritant. Milk and lime-water and cream are always safest for the first feeding by the mouth. An ice bag may be laid on the epigastrium during active bleeding, but should not be retained too long at a time.

I have said nothing so far as to medicines, save as regards morphine. We never use astringents now as was formerly the practice. Subnitrate of bismuth and calcined magnesia are the best to employ, a scruple of each, after a few days when the bleeding is stopped. The lower bowel should be washed out daily and the stools examined for melæna. Calcium lactate in 15-grain doses three times a day has been suggested, but I have not employed it, and adrenalin has been tried, but it was of no avail in one case of mine some years ago. I think that it is not a desirable agent in these cases, and I believe that in most cases we may dispense with any of these drugs if we carry out the physiological principles I have inculcated in every detail.

I should mention the desirability of performing gastro-enterostomy in cases where ulceration is found near the pyloric orifice on opening the stomach. The risk here is that pyloric obstruction may result from a scarred ulcer leading to dilatation and other difficulties. A subsequent operation for the relief of this may thus be avoided.

You are aware that many patients suffer from gastric ulcer without any hæmorrhage, or with very small bleedings. I am not concerned to speak about chronic ulcers to-day, and in regard to hæmorrhage from cancerous growth in the stomach I will only mention that we do not meet with this in persons under 40 years of age, and that there is seldom any serious loss of blood in such cases. Coffee-ground vomit is more common, and this may also be met with both in acute and chronic ulcers.

Apart from gastric ulceration, the most formidable cases of hæmatemesis that you are likely to meet with are those dependent on advanced cirrhosis of the liver. This is always a serious and often a terminal symptom in such subjects. The bleeding commonly occurs from rupture of varicose veins at the lower end of the œsophagus—œsophageal piles as they are sometimes called. The loss of blood is sometimes enormous, usually of very dark colour. Recurrence of it is almost certainly fatal. You will treat such cases just as you would any others. Happily, with the amendment now recognised in gross alcoholic habits, we do not meet with such examples so often as formerly. Melæna to a large extent occurs in these patients. The liver may be large, and is not always shrunken as might be expected when such an engorgement of the portal venous system is present.

Patients suffering from gastric hæmorrhage are always likely to do best in hospitals or nursing homes where they can secure skilled watching, and be saved from their own importunities and the dangerous meddling of relatives. The case I have related was tended with much skill and devotion by my house physician, Mr. West.

There are no specimens in our museum here to illustrate the superficial erosive ulcer. In the past these have been missed or overlooked at the necropsies for the reasons we have noted.

A CASE OF ACUTE PANCREATITIS; OPERATION; RECOVERY.

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THE subject of acute pancreatitis in all its varieties has received much attention of late years, and the seriousness of the affection has been abundantly shown. So far, the records of cases successfully treated by operation are comparatively few, although it is fair to assume that most, if not all, of the recoveries have been published, while many of the unsuccessful attempts at relief have been left unnoticed. It is satisfactory, therefore, to be able to add to the list of successes one more case where prompt surgical interference has been followed by complete recovery. My own personal experience of operations for the condition is not large and

¹ Brit. Med. Jour., May 24th and August 27th, 1910. Post-mortem digestion rapidly effaces these very superficial erosions.

² Transactions of the Clinical Society, vol. xxxvii., 1903.

³ St. Bartholomew's Hospital Reports, vol. xli., 1909.

⁴ Brit. Med. Jour., May 21st, 1910.

the case now to be recorded is the only one in which recovery has followed. I have, however, seen, I believe, several cases in too serious a condition to justify any hope of improvement by operation, which have therefore been left untouched and which have succumbed. The good result in this case was due as much as anything to the prompt action of the medical man in charge in sending so serious a case at once for surgical relief.

On Feb. 21st, 1910, Dr. C. E. H. Warren of Selhurst sent me a message that a case of some acute abdominal affection was on the way to the hospital. She was seen at once on arrival, and recognised as being in a very serious condition. I could only be sure of one thing—i.e., that a grave abdominal lesion, accompanied by peritonitis, was present and called for immediate operation. The hospital notes are as follows.

The patient, a married woman, aged 40 years, was admitted into University College Hospital on Feb. 21st, 1910. Two days before (the 19th) she was suddenly seized with a severe pain of a gripping character in the upper part of the abdomen above the umbilicus. She vomited and "trembled" with pain, but apparently no definite rigor occurred. The pain subsided, but had returned in paroxysms from time to time, causing further sickness. The bowels had not moved since Feb. 18th; the patient could not say whether flatus had been passed or not. Before admission two enemata were given without result.

Past history.—Six years ago, one month after the birth of her first child, she had a similar attack of pain and vomiting with constipation, and, again, six months ago, after the birth of her last child, there was another attack like the first which lasted 48 hours. All pregnancies had been normal; there had been no miscarriages. The patient's husband thought that after the first attack she was jaundiced, but there was no jaundice with the last attack.

State on admission.—The patient was well nourished and had not quite the peritonitic facies. The pulse was 124 and the temperature was 101.4° F. The abdomen was soft and not fuller than normal. The patient complained of pain in the epigastrium and the left hypochondrium. In the last situation and in the left lumbar region there was tenderness on palpation. There was no dulness in either flank, and no loss of liver dulness was noted. The kidneys were not to be felt. The rectum was empty and distinct tenderness was experienced on palpation with the fingers on its left wall at the level of the fundus uteri. An enema produced no result. The urine contained no sugar, blood, or albumin. There was practically no shock on admission.

First operation.—A review of the history and condition on admission did not appear to me to justify any positive diagnosis. It was plain, however, that peritonitis was present from some sudden cause, the nature of which was obscure. In view of this fact I opened the abdomen in the middle line below the umbilicus at 9 P.M. There was some clear, slightly blood-stained fluid in the general peritoneal cavity. The pelvis was first explored, and only a burst Graafian follicle was found. The sigmoid was not distended and contained hard faeces. The vermiform appendix was normal. The small intestine was everywhere markedly injected and a little dilated, but was not paralysed. It was traced from the caecum to the duodenum, and several flakes of lymph were found upon it. The condition was puzzling until I drew down the transverse colon, when several patches of fat necrosis were seen in the great omentum close to the colon 4 or 5 mm. in diameter. A portion of the omentum so affected was tied off and removed for examination and showed the fat necrosis still more clearly when treated subsequently by Benda's method. The omentum was now torn through between the stomach and colon, and the small sac of the peritoneum opened. In it were found many more patches of fat necrosis, increasing in number as the pancreas was approached. This organ itself was felt to be hardened and swollen, especially at its head. I did not think anything further could be done then, and simply introduced an iodoform gauze tampon down to the pancreas and brought it out of the upper angle of the abdominal wound, the rest of which was stitched up in two layers.

On Feb. 22nd the patient had slept well and had been easy. The pulse was 112 and the temperature was 99.4°. The bowels were opened twice during the day, the result being constipated. Saline injections were returned. On the 23rd

faeces were still passed of normal appearance. The conjunctivæ were slightly yellow; there was no glycosuria; the tongue was very dry. The patient was fairly well, but was very weak. On the 24th she vomited after food. On the 25th some of the plug was removed. The patient was slightly jaundiced. On the 26th the remainder of the plug was removed; she was still jaundiced. On the 27th a clay-coloured stool was passed after calomel. The temperature was 100.2°. On March 1st stitches were removed. The temperature was rising at night to 100.2°. On the 3rd, at 6.45 P.M., the patient was seized with abdominal pain from the nipples down to the umbilicus. There was at the same time tenderness over the whole abdomen, most marked over the tip of the right ninth costal cartilage. The pulse rose to 124. The temperature fell to 98° at 10 A.M. Morphia was given, but the pain continued all day. She began to vomit at 4 P.M. and did so three times, bringing up 2 ounces. On the 4th she vomited several times, bringing up 12 ounces in all, but the general condition seemed better. In the morning the temperature was 100.4° and in the evening 101.4°. There was no increase of distension. The pain continued the same as on the previous day, but the point of greatest tenderness was now over the tenth rib on the left side and no longer on the right side over the gall-bladder. She now began to take pancreatin tabloids on account of fat in the stools. On the 5th there were more pain and tenderness, and she was weaker. The temperature at 10 A.M. was 101°.

It now appeared to me that there must be some exacerbation of the inflammation in the pancreas, and I thought of opening and draining the gall-bladder. But when the pain was overcome by a general anaesthetic a distinct fulness could be felt in the neighbourhood of the spleen where the tenderness had been most marked before. I therefore proceeded to try to open the omental sac behind from the left flank.

Second operation.—On March 5th an incision was made starting two inches to the left of the navel and running obliquely upwards and backwards. Extensive fat necrosis was found in the extra-peritoneal fat, and portions came away on the gloves and were reserved for further examination. The peritoneal sac was opened behind the splenic flexure of the colon below the spleen, and at once about 6 to 10 ounces of blood-stained fluid streaked with pus escaped under considerable pressure. This was followed by a pretty free escape of venous blood, which ceased on the introduction of a large long rubber drain-tube as far as the pancreas. The mass felt before operation was now proved to be the enlarged pancreas head. The spleen did not appear to be increased in size. A somewhat smaller rubber tube was introduced beside the first into the tissues of the loin outside the peritoneum, and the wound was partially stitched up from below. Sterile gauze dressings were applied over all.

On the next and the following days the condition was fairly good, the discharge from the wound being moderate. From this on there is nothing special to record until April 10th, except an irregular temperature between 100° and 101.4°, consequent, I believe, on some difficulty in retaining the drain-tube in the omental sac. The note on April 10th states that the patient had improved steadily; she was stronger and looked much better. The temperature, however, was never quite normal, and on the previous night had been 103.6°. The discharge from the tube in the omental sac had continued abundant, but fluctuated in amount. At 2 P.M. on this day the patient was seized with pain over the fundus of the gall-bladder. Tenderness was also most marked over this spot, but radiated over the whole abdomen, especially in the left flank. The pain was very severe and was only relieved by a full dose of morphia. There was no rigor. The temperature at the onset was 102°, but fell at 10 P.M. to 100.6°. The patient vomited seven times to the extent of 24 ounces during the night, but felt easier in the morning. The pain remained over a palpable mass to the left of, and below, the umbilicus (? undrained area). There was no icterus. From this time there was steady improvement, the drain-tube was progressively shortened, and was left out finally on May 17th, a dry gauze dressing being applied.

On May 20th a number of carious teeth were removed and some more on the 27th. The patient now appeared to be in excellent condition and was free from all pain. She was eating well and had much increased in weight. She was

therefore allowed to go home on May 31st. The temperature had been normal for 12 days and the wounds were soundly closed.

Remarks.—The difficulty of diagnosis in this case was very great. In some ways the attacks resembled recurring appendicitis. But the tenderness and resistance were on the left side and were more marked above than below; indeed, there were little tenderness and no resistance over the cæcum. That some grave intra-abdominal inflammation was present, however, there could be but little doubt, and what this was could only be cleared up by opening the peritoneal cavity. In this obscurity I felt it best to incise in the middle line and even then the condition was not clear until the fat necrosis revealed the true state of things. The white patches in the great and gastro-colic omentum, standing out in contrast to the fat lobules and slightly stained serous membrane, were unmistakable. These increased in number when the bursa omentalis was opened. There was only a little blood-stained serum in the latter, but the pancreas was felt to be swollen and tender. Drainage of the omental sac appeared to me to be indicated as much on account of possible increase of discharge from breaking down of the pancreas as for the release of any present at the moment. As a matter of fact, this first drain opening yielded comparatively little and soon closed. This seemed to point to the conclusion that the condition was still mainly retroperitoneal. This was proved to be the case by the subsequent course of the disease and the finding at the second operation of extensive fat necrosis in the retroperitoneal tissues, so that these required a separate drain-tube for themselves. But it was not until the lesser sac of the omentum was opened behind the colon that a large collection of inflammatory fluid was found. The exacerbations which occurred even after this was drained off appeared to me to be due partly to the difficulty of retaining the rubber tube in the omental sac, the opening into which was only of about the size of my gloved finger. But it may easily be that they were due to progressive invasion of the pancreas by the inflammatory process even after efficient drainage had been secured. Before the swelling in the left hypochondrium was discovered I was tempted more than once to open and drain the gall-bladder. But I am glad now that this was not done, as the opening of the omental sac behind the colon in the left flank could alone have relieved the patient. It may be suggested that to have drained the gall-bladder would have possibly reduced the infection of the pancreas. But this is only a supposition. The old maxim, *ubi pus ibi evacua*, held good here, and I was glad of its guidance. The result at all events left little to be desired.

As regards diet in this case directions were given to have all the light fluid food sterilised in order to minimise the chances of further infection of the pancreas from the intestine.

An attempt was made to obtain a regular analysis of the fæces from the pathological department, but there were difficulties in this direction which could not be overcome. What was undertaken led to no definite results. The bacteria which were cultivated from the discharge obtained from the pancreatic abscess were streptococci. The peritoneal effusion met with at the first operation proved to be sterile on cultivation.

It is gratifying to be able to add one more successful case to the relatively few that have been recorded of recovery from this fell disease. Prompt and prolonged drainage appeared to be all that was required in this case for recovery, and the great increase of flesh and general well-being justifies the hope that this recovery will be permanent. The removal of decayed teeth, with the relief of the pyorrhœa alveolaris, and the use of a complete denture will also reduce the chances of subsequent infection considerably.

Sequel of the above case.—The subsequent history of this case adds, I venture to think, considerably to its interest. The patient, of whom I heard from time to time since her discharge from hospital, remained well up to the beginning of this month (October, 1910). On the morning of Oct. 14th last I was told that she had been readmitted with serious abdominal symptoms, which had set in on the 13th, and naturally thought of a recurrence of the pancreatitis. On seeing her she at once struck me as being very ill; her tongue and lips were dry; she was in great pain and looked pinched. The temperature was subnormal (98.2°), and the pulse 124. The pain was now in the lower part of the abdomen and the

tenderness most marked in the left hypogastric region. The area in which the former pancreatic swelling had been situated was normal and both flanks were resonant. The question of strangulation by band following the former operation was considered and was thought probable. But remembering that pancreatitis may recur and that the symptoms of the previous illness were very like those now present, I thought the best course was to open the abdomen through the old scar in the left flank and to explore the condition from there. This was done on Oct. 14th, at 9 P.M., when empty coils were traced to the cæcum and very much distended gut to a congeries of coils held together by adhesions lying in the pelvis. The latter were drawn up with some difficulty after separating numerous adhesions and proved to be a volvulus twisted over some of the adhesions. When all the latter had been freed and free inflammatory fluid had been mopped out the contents of the distended gut were squeezed through the liberated volvulus into the empty gut and onwards into the colon and the wound was closed. But before this was done I took the opportunity of examining the pancreas with the fingers and found nothing abnormal to the touch except that the organ appeared to be smaller than usual. There was no trace this time of any of the fat necrosis so obvious in the former attack, and the urine and fæces which were passed later (17th) were normal.

The patient made a good recovery after some days of great pain and rise of temperature, and is now (Oct. 25th) looking and feeling very well, the wound being healed by first intention. The original attack in this case was not due to one of those fulminating processes in which wide sloughing of the pancreas occurs, from which, I believe, no recoveries under any treatment can be expected. But the suddenness and severity of its onset, with fever, peritonitis, and fat necrosis, justify its being placed among the acute cases. The opportunity of examining the abdomen *in vivo* some eight months after an attack of pancreatitis must be a rare one, and the absence of any palpable evidence of damage from the earlier inflammation of the pancreas encourages the hope that prompt drainage from behind may serve to arrest the disease in other cases.

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PHAGOCYTOSIS OF ERYTHROCYTES BY ENDOTHELIAL CELLS:

SOME POINTS IN CONNEXION WITH IT, AND A METHOD FOR ITS DEMONSTRATION.

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OF previous laboratory experiments on the phagocytosis of red blood corpuscles, the greater number have been performed on the blood of animals artificially immunised to foreign erythrocytes. The iso-agglutinins (for erythrocytes) of human serum have been the subject of much investigation by Hektoen¹ and others. Such sera may be divided, as regards their origin, into two classes: (a) "natural" agglutinating sera, where the serum from a normal person agglutinates the red corpuscles of other normal individuals; and (b) "immune" agglutinating sera, where the sera from cases of disease agglutinate the erythrocytes of other diseased or normal human beings.

The power of such sera to bring about phagocytosis of the red corpuscles which they agglutinate has not been investigated to the same extent. Recently Dudgeon² has investigated the hæm-agglutinins, hæm-opsonins, and hæmolysins present in human blood sera. In the experiments to demonstrate phagocytosis he employed washed human leucocytes from normal and "immune" bloods. Out of a large number of observations he noted few instances in which phagocytosis of red corpuscles was present to a marked extent. At the conclusion of his second communication he states:—

In the concluding remarks in the preliminary paper on hæm-opsonins it was stated that "the experiments referred to in this communication entirely agree with the observations of Barratt and Keith, conducted

¹ Hektoen: Journal of Infectious Diseases, vol. iv., p. 297.

² Dudgeon: Proceedings of the Royal Society, Series B, vol. lxxx., 1908; vol. lxxxi., 1909; vol. lxxxii., 1909.