stomach with the radiosopic screen. After a bismuth meal it could be seen that the greater curvature of the stomach extended as low as the plane of the anterior superior spines when the patient stood up, and active peristaltic movements of the stomach were clearly made out. Test meals showed that free hydrochloric acid was present in the gastric secretion, and also that the stomach contents were retained for many hours beyond the normal. A feature of the case was the absence of sarcinae; apparently, although there was marked stasis of stomach contents, there was little or no abnormal fermentation going on.

This man had therefore marked dilatation and ptosis of the stomach. It was not purely atonic dilatation, for we could see the stomach walls in active and forcible peristalsis. The ptosis was not part of a general abdominal ptosis for no other organ exhibited it. A forcible peristalsis which we can see must always be taken as a definite sign of obstruction, an attempt of the viscus to empty itself against resistance. In this case we judged by what we could see with the screen that the obstruction was at or about the stomach outlet. Considering its presence it is a rather remarkable fact that the man had not suffered from vomiting; it would appear that the stomach had always been able to pass on its contents, although the marked dilatation showed that it had been done under difficulty.

In view of the evidence of obstruction about the pylorus we had no hesitation in recommending an operation. There are types of gastric dilatation in which operation is useless. Purely atonic dilatation of the stomach does occur, although in the past some of the cases so diagnosed were probably a late stage of dilatation resulting from obstruction. In purely atonic dilatation operation is not of value, but the condition is decidedly a rare one. Operation is again of little value when gastric ptosis and dilatation is simply a part of a general ptosis of the abdominal organs. These two conditions should therefore be excluded when the stomach is found dilated before any decision is made to advise operation. In this case on opening the abdomen a cicatricial stenosis of the pylorus was found, and the stomach besides dilatation showed marked hypertrophy of its walls. Posterior gastro-jejunostomy was performed, and care was taken to provide a large opening of 2½ in. The patient vomited twice on the evening of operation, but has not done so since. He was allowed milk diluted with Vichy water on the following day, and now, six days after his operation, he is on a light diet. He has been given bicarbonate of soda, and carbonate of magnesia after each meal in order to prevent any high acidity of the gastric juice, which would interfere with the healing of his gastro-jejunostomy wound. Experiments have shown that such wounds take three or four weeks to heal.

This case belongs, as did the first, to the class of gastric conditions in which the necessity for operation is accepted by all. If you can demonstrate that there is in any portion of the alimentary canal an actual mechanical obstruction to the onward passage of the contents the wisdom in advising operation for the relief of this obstruction is unquestioned. It is of course unnecessary when the ulcer is cicatrized to deal in any direct fashion with it, and we can give complete relief by short-circuiting the food stream. It is very necessary in doing so to be careful of two things—first, to provide a large anastomotic opening; secondly, to avoid the formation of an acute angle at the point of anastomosis. With the latter object a posterior anastomosis is preferred, joining the jejunum to the stomach as close as possible to the commencement of the former.

The indications for operation presented by these three cases by no means exhaust the problems of operation in gastro-duodenal ulceration. You will observe that all three illustrate rather complications of the ulcerative process than simple ulceration itself. In considering the advisability of operation in simple chronic ulceration we are faced with the not infrequent difficulty of diagnosis. Pain, with a constant time relation to the intaking of food, is a symptom sufficient on which to base a definite suspicion of gastro-duodenal ulcer, but it needs to be supported by further evidence before one can say with anything approaching certainty that the ulcer is present. Of the phenomena which lend it support hæmorrhage is far and away the most important, and it is therefore worth while taking a great deal of trouble to discover whether

there is bleeding into the stomach or duodenum. In some cases persistent pain in spite of treatment is in itself sufficient justification for an exploratory operation. Such an operation is not speculative, as we know that this pain, with a constant relation to food, is in some cases the one and only symptom of ulcer, and also of other gastric or perigastric conditions remediable by surgical measures.

Most surgeons nowadays prefer to deal with an ulcer directly—that is to say, by resection. The most important argument of all for this proceeding is the frequency with which carcinoma is implanted on ulcer. On this subject a most important communication has recently been made by Dr. W. C. McCarthy of St. Mary's Hospital, Rochester, from which it would appear that this sequence of events is even more common than has hitherto been expected.

I shall say no more on the subject of ulceration apart from its complications, as I have at the moment no illustrative case to show you. I will simply give you some reasons why we should take the opportunity which surgery affords of relieving patients from this serious disease even in the absence of complications. In the first place, gastric ulcer untreated is attended by a mortality which has been estimated at 10 per cent.; in the second place, whether medically treated or not, it is liable to be complicated by accidents seriously endangering life; in the third place, while it is notoriously difficult to obtain definite healing, when this does occur it is liable to be associated with such cicatricial contraction that stenosis follows.

HEPATIC ABSCESS FOLLOWING ACUTE APPENDICITIS.

By LEONARD A. BIDWELL, F.R.C.S.,
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THE occurrence of hepatic abscess after acute appendicitis is a very rare complication, and although a considerable number of cases have been collected and recorded by Kelly and others, in most of them the suppuration in the liver had only been discovered at a *post-mortem* examination, and the abscesses were multiple, and therefore were scarcely amenable to surgical treatment.

In the two cases which have occurred in my practice, both were discovered during life and treated by operation.

In the fatal case I believe that no other abscess was present, as I had the opportunity of examining the liver a week after opening the hepatic abscess, and then no external evidence of another liver abscess could be detected. In the successful case the abscess was certainly single. The occurrence of suppuration of the liver is usually a late phenomenon seldom occurring until some weeks after the acute attack. In my two cases the interval between the commencement of the disease and the detection of the abscess was eight weeks and four and a half weeks respectively. It is interesting to note that both cases were apparently convalescent, with a normal temperature for the first fortnight after the operation on the appendix. In one case the abscess followed an operation for an appendix abscess, which was opened about three weeks after the initial attack and was thoroughly localized; while in the second case the operation was performed for a perforated appendix with localized peritonitis within forty-eight hours of the onset of the disease.

There is little doubt that the poison is carried to the liver by means of the portal vein, and that the abscess results from pylophlebitis. The patches of pylophlebitis must be close together and the infection very virulent for a single abscess to form. When the patches of pylophlebitis are separated from each other by any amount of normal liver tissue, we shall have the condition of small multiple abscesses, which is more commonly found in the *post-mortem* room. It is interesting to note that the pus obtained from a liver abscess does not have the characteristic odour of pus from an abscess in connexion with the appendix. With regard to diagnosis, it is practically impossible during life to distinguish between a liver abscess and a subphrenic one. The only point which would suggest abscess of the liver, rather than subphrenic abscess, would be bulging of the right side of the chest with increase in

the width of the intercostal spaces rather than pushing down of the whole liver. When an exploratory puncture has been made and the pus has not got the characteristic odour of an appendix abscess the suspicion that the case is one of hepatic abscess will be considerable. It is often stated that cases of hepatic abscess following appendicitis will show some amount of jaundice, or at any rate an icteric tinge in the conjunctivae. This sign, however, cannot be of great importance, as it did not exist in either of my patients.

With regard to treatment, it is important that the surgeon should be prepared to operate immediately he has discovered pus by means of an exploring needle, since there is a risk of escape of pus into the pleura or peritoneal cavity when the needle is withdrawn.

The abscess will practically always be reached by a similar incision to that employed for subphrenic abscess, namely, one over the ninth rib behind the anterior axillary line. Portions of the ninth and tenth rib are resected, and the diaphragm exposed. In some cases the pleura will be opened in this incision, and if so, its edges should be stitched to the diaphragm.

When the diaphragm is divided, the posterior surface of the liver is exposed, and the exploring needle should be inserted in the direction in which pus had previously been found. When pus is found a director is passed down by the side of the exploring needle, and the exploring needle removed. Gauze is then packed in between the liver and the diaphragm. A pair of sinus forceps are inserted along the groove of the director into the abscess cavity, and a track broken down through the liver substance by withdrawing the forceps. Along this track a large drainage tube is inserted, and the abscess sac is washed out with saline solution by means of a small catheter inserted through the drainage tube. The drainage tube is fixed to the skin, and the rest of the wound closed. There is little risk of any trouble with the pleura, but there may be more risk of infection of the subphrenic space; this occurred in my first case, and was responsible for its fatal termination. The following are the two cases which have occurred in my practice:

CASE I.

A young man, aged 25, was first seen by me on February 7th, 1903. He had had an attack of appendicitis at Christmas, 1901, but this only lasted one or two days. Another more severe attack occurred at Easter, 1902, which lasted three or four weeks, and during the attack the patient had a high temperature, vomiting, and a definite lump in the right iliac fossa. The lump, however, disappeared after rest in bed, and he remained in good health until the middle of January, 1903, when he suffered from another acute attack of appendicitis. It commenced with vomiting, and the temperature had been irregular, varying between 102° and 99°. A definite lump had been discovered a few days before I was asked to see the case, three weeks after the commencement of the attack.

On examination there was a large swelling in the right iliac fossa, which was dull on percussion. The rest of the abdomen moved well and was quite soft. On rectal examination it was found that the inflammatory mass extended towards the pelvis. On the following day the patient was anaesthetized and an incision made in the right iliac region. The abscess was opened without separating any peritoneal adhesions. It was found to extend into the pelvis; no search was made for the appendix; two drainage tubes were inserted, one upwards towards the appendix, and the other downwards into the pelvis. The temperature became normal on the day following the operation, but on the third day some faecal matter was noticed in the dressings. This, however, stopped after about a week; the tubes were removed and the discharge became trifling in amount, the temperature remaining level. Three weeks after the operation the temperature again rose. Careful examination of the wound failed to elicit any cause.

I saw him on March 4th, and again on March 10th, but could not discover any evidence of a collection of pus. The temperature remained high, the pulse rapid, and the tongue foul.

On March 15th I found that the liver dullness was slightly increased downwards, and there was some tenderness over the liver. I decided to explore the liver. An incision was made in the upper part of the linea semilunaris, and the liver exposed. There were no adhesions in the neighbourhood of the liver. On passing a trocar into the liver pus was obtained. A free opening was made into the abscess of the liver, and a drainage tube inserted. The patient progressed favourably for a week. The temperature became normal, and his general condition improved. On March 20th his temperature again rose, and on examination it was found that there was a mass in the right lumbar region, which was tender on pressure. An incision was made in the loin, and a subphrenic abscess opened and evacuated. The temperature fell after this, but the patient died a few days later from exhaustion.

In this case the original appendix abscess had formed nearly three weeks after the commencement of the attack of appendi-

ctitis. When opening the appendix abscess no adhesions were disturbed and no evidence of any septic absorption appeared until three weeks after the operation. Without any rigor the temperature suddenly rose and remained high until the abscess of the liver was discovered and opened, thirty-five days after the original operation.

The further complication of the subphrenic abscess was probably due to some escape of pus from the liver abscess, which tracked round to the posterior surface of the liver. This would probably have been avoided had a counter-opening been made into the liver after resection of a rib.

CASE II.

A boy, aged 15, was admitted into the West London Hospital on January 14th, 1910. He had been seized with acute pain in the right iliac fossa forty-eight hours previously and had vomited several times. On admission his temperature was 102°, pulse 100. The abdomen did not move on respiration, but was not distended. There was acute tenderness and rigidity of the lower half of the right rectus muscle. There was no loss of resonance in the right iliac fossa. The patient was put under an anaesthetic immediately after admission, and the abdomen opened by the gridiron incision. An abscess cavity, containing 2 or 3 oz. of pus was found between the caecum and the anterior abdominal wall. This was emptied and wiped clean.

The appendix, which was gangrenous, was removed, and a gauze plug left in the abscess sac. The patient's temperature fell to normal immediately after the operation, and remained so for three days, when the gauze plug was removed. The temperature remained up for three days, and then dropped to normal, and remained nearly normal for a week. Fourteen days after the operation the notes state: "Discharge very slight, temperature normal, progress satisfactory, wound almost healed." After this the temperature rose on several occasions to 101°. There were no signs of any bowel irritation, but some dullness was found at the base of the right lung.

On February 3rd, as the temperature was still up, and the dull area at the right base had increased, an exploring needle was introduced, and about 2 drachms of clear fluid were removed. This was examined microscopically. No pus nor micro-organisms were found; the cultures also were sterile. The chest condition remained unchanged, the temperature varied between 103° and 100°, so an exploring needle was again inserted on February 10th, and clear fluid again drawn off. This was again examined, and no micro-organisms found. On February 12th there were still signs of fluid in the right pleura, the lung was compressed, and the heart slightly displaced to the left. Whispering pectoriloquy was well heard over the dull area. The liver was slightly depressed, and extended a fingerbreadth below the ribs. The rest of the abdomen was normal. The temperature was 101°. The chest was aspirated, but only 1½ oz. of clear sterile fluid was obtained.

On February 15th it was noted that the liver extended three fingerbreadths below the costal margin. The signs at the right base were unaltered. The temperature remained 101°. The right base was again aspirated; a long needle was used, and was pushed deeply into the liver, when pus was drawn off. This pus was examined in the laboratory, and was found to be swarming with bacteria, which were mostly coliform organisms, but there were also streptococci; the former were obtained in cultures. In the pus there were also many cells of the liver parenchyma, some in columns, and others detached. The exploring needle had been inserted in the seventh interspace, so an incision was made over the eighth rib, which was resected in the mid-axillary line. The pleura was opened; it contained some clear fluid, and was shut off with sutures.

The diaphragm was divided, and the posterior surface of the liver exposed. The abscess was opened, as described above, and about 8 oz. of pus let out. A large drainage tube was inserted, and the cavity washed out in saline. The temperature fell to normal immediately after the operation, and the discharge quickly diminished in amount, the tube being removed a fortnight after the abscess had been opened.

The patient was discharged to a convalescent home five weeks after the incision of the liver abscess, all wounds healed soundly, and he is now in perfect health.

A CAUSE OF DEATH AFTER OPERATION FOR APPENDICITIS:

THE THREE LINES OF DEFENCE.

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It cannot have escaped notice that operations for appendicitis, especially when performed upon children, are far too frequently followed by a fatal ending, which sometimes occurs with startling rapidity, not necessarily in the severe and apparently more dangerous cases of general peritoneal infection, but where a localized abscess has been operated upon by a skilled surgeon, and there is no obvious reason for such an untoward result.

Unfortunately in the medical journals it is too customary to record successful cases, and for the fatal ones we must