fair to assume might have been altogether prevented or at any rate delayed by an earlier relief to the stomach.

In Case I I used my own method of suture; in II Senn's plates; in III, V, and VI my own method again, and in IV Murphy's button. As far as this experience, taken with other cases of intestinal surgery, justifies me in forming a conclusion I should certainly prefer simple suture with fine silk to any other contrivance. The time in my last cases spent over the operation was not excessive, and I had no fear in them of the button falling back to the stomach or jamming in the intestine.

The absence of free hydrochloric acid in the two last cases in most of the washings of the stomach strengthens the view generally held on this point.

This experience is on the whole not very cheering as regards gastro-enterostomy for advanced cancerous disease of the stomach, but as far as it goes appears to deserve to be recorded, and it strengthens the belief that if done early the operation can give relief.

THE TREATMENT OF ACUTE GENERAL PERITONITIS ORIGINATING IN THE VERMIFORM APPENDIX,

WITH ILLUSTRATIVE CASES.*

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THE observations of surgeons and pathologists during the last ten years have conclusively proved that the various diseases recognised clinically under the names of typhilitis, perityphlitis, and certain forms of peritonitis all have their origin in certain morbid conditions of the vermiform appendix. According to the nature and degree of the primary lesion in the appendix and the nature and extent of the secondary results to which it gives rise, the clinical picture presents many varieties, the recognition and treatment of which have given rise to much discussion. Of these varieties the most severe and fatal is that in which disease of the appendix gives rise to acute general peritonitis, and the object of the present paper is to make a few remarks on the treatment of cases of this kind.

It was in these cases that *post-mortem* examination first clearly revealed the importance of the appendix as a pathological agent. As it was often found to be perforated by a foreign body or small faecal concretion, this was naturally regarded as the origin of the mischief. The exact part played by foreign bodies and concretions is even now by no means clear; but it is certain that general peritonitis may have its origin in an appendix which contains no solid body and in which no perforation exists; it is certain also that in all cases the peritonitis is due to the invasion of the peritoneal sac by micro-organisms derived from the interior of the appendix, whether they escape from it through an actual perforation or penetrate its intact but damaged wall.

With regard to the distinction between local and general peritonitis it is difficult logically to draw a hard and fast line, for even in the worst and most fatal cases the inflammation is hardly ever universal; but for practical purposes the case may be termed general when pus or septic fluid is found in the pelvic pouch, in both flanks, and among the small intestines as high as the navel, and when the inflammation is nowhere limited by firm adhesions. Such a condition, even when the upper part of the belly and the peritoneum covering the stomach, liver, and spleen is not obviously affected, is almost always fatal, and gives rise to a clinical picture quite distinct from that of a localised peritoneal abscess however large. Moreover it demands a different and much more energetic treatment.

Acute general peritonitis, thus defined, may arise in several ways, each way presenting somewhat different clinical history and symptoms. The first and most characteristic may be called the acute fulminating variety. Pathologically this consists of a very acute septic invasion, spreading with such rapidity that the greater part of the peritoneum is involved

in twenty-four or thirty-six hours, and in which the virulence of the micro-organism is so great, or the resistance of the tissues so feeble, that the inflammation is not limited by the formation of durable adhesions among the surrounding intestines. The absence of the power of resistance is also shown by the tardy formation of pus, for even on the third or fourth day the abdomen may be found to contain little pus, but an abundance of turbid stinking serum. Clinically this type of acute appendicitis presents a familiar picture, in which a quite sudden onset of acute abdominal pain, rapidly followed by vomiting, distension, constipation, and collapse with abdominal facies, form the chief features. If nothing is done death occurs with all the familiar features of general peritonitis from the seventh to the tenth day. The history and symptoms of such a case, together with the actual state of the appendix forty hours from the onset of the illness, are well illustrated by the following case, which occurred recently in my practice.

CASE I.—On the night of August 21st, 1897, a man, aged 30, went to bed feeling quite well. After a somewhat disturbed sleep he woke at 6 A.M. with a severe gnawing pain in the right iliac region of the abdomen. He took a little brandy, and a quarter of an hour later vomited. The pain continued during the day, and he vomited two or three times; the bowels also acted once. The pain having become more severe he took aperient pills and some salts, but vomited both back without effect. After this the stomach rejected everything soon after it was taken. About thirty-six hours after the first onset of pain I saw him in consultation with his medical attendant. He had then a typical abdominal facies, a quick, full pulse, a temperature of 101° , and a somewhat distended and rigid abdomen, with considerable tenderness, but no swelling in the region of the caecum. I had no hesitation in diagnosing acute appendicitis, and on opening the abdomen a few hours later found acute general peritonitis of the lower abdomen on both sides, with about a pint of turbid inodorous fluid with flakes of lymph. The appendix was swollen to the size of a man's forefinger, intensely injected, and its tip covered with recent lymph. After removal it was laid open and found to be filled tightly with dark recent blood clot adherent to a much swollen and injected mucous membrane. The operation was borne well, and the subsequent progress of the first four days appeared most satisfactory. Vomiting ceased, food was retained, the bowels acted, all distension and tenderness disappeared, and the normal respiratory movement of the abdomen was restored. The temperature, however, remained between 100° and 101° . On the fifth day he became maniacal, incessantly talking nonsense, and refusing food. These symptoms grew worse; he had no sleep, rapidly emaciated, and died exhausted on the eighth day without any return of abdominal symptoms. No *post-mortem* examination was permitted.

The above case is a good example of the acute fulminating variety. Another variety is that which follows the bursting of a localised abscess around the appendix by some mechanical cause, such as a blow or strain. In many cases there is a distinct history of this kind, and I have known a case in which the history and symptoms appeared to point clearly to rupture of the intestine, prove to be one of acute general peritonitis supervening on old quiescent mischief in the appendix. In the following case, although there is no history of a blow or strain, the fact that a localised swelling in the right iliac region was detected on the third day of the illness, and that on the following day the patient had a sudden attack of agonising pain followed by general collapse makes it probable that a localised abscess had suddenly burst into the general peritoneal cavity. The history is as follows:

CASE II.—On January 4th, 1897, a healthy boy of 14 felt poorly, and was given two aperient pills by his mother. The following day he was purged, and vomited, and complained of pain in the belly of sudden onset. On the third day the doctor in attendance found a swelling in the right iliac region. The next day, after a sudden agonising pain followed by collapse, a consultation was held, and a few hours later I opened the abdomen, and found a quart or more of turbid, semipurulent, very offensive fluid in the general abdominal cavity. There was acute general peritonitis on both sides as high as the navel. On separating some adhesions round the appendix a collection of more purulent fluid escaped. The appendix, which contained a concretion, but was not perforated, was removed, and the lad, after passing through a condition of prolonged and dangerous collapse, eventually made a good recovery.

There is one more variety of acute general peritonitis originating in the appendix. In this variety the onset is less acute and the early symptoms less severe. In fact, clinically it appears to be an ordinary case of what used to be called typhilitis. There is little pain, moderate fever, a tender swelling in the right iliac region, and constipation, but no vomiting after the first day; but the swelling, instead of gradually disappearing, or coming to the surface in the form of a localised abscess, becomes lost in increasing general distension, which begins in the lower part of the abdomen and then spreads upwards. These symptoms point to a gradual spreading of peritonitis beyond the area to which it was at first confined by intestinal adhesions. The general symptoms

do not quickly become alarming, and cases of this kind may last a fortnight or more before death occurs, as it invariably does unless relief is given by operation. The following is the history of such a case:

CASE III.—On July 16th, 1897, a boy aged 11, apparently in good health, fell from a wall. During the whole of the following week he complained frequently of pains in the belly. On July 22nd, as the pain was worse and he began to vomit and to pass slimy, offensive motions, a doctor was summoned. Under small doses of morphia he at first greatly improved, but on July 27th, eleven days after the fall from which he dated the first symptoms, he seemed worse, and I saw him in consultation. The boy was slightly flushed, but had a perfectly tranquil expression. Just before my arrival he had got out of bed and passed a normal motion. The mouth was dry; the abdomen showed slight general distension and marked rigidity and tenderness, the latter chiefly on the left side, to which most of the pain had also been referred. There was no localised swelling in the right iliac region, and no tenderness of McBurney's point. *Per rectum* there was a tense, elastic swelling in the recto-vesical pouch. The diagnosis hesitated between general peritonitis arising from the appendix, and intussusception only partially strangulated. On opening the abdomen, a large quantity of stinking pus was found in the pelvis and in both flanks. The appendix was perforated, and a small concretion which had escaped from it was found in the pelvic pouch. The appendix and a large piece of infiltrated omentum were removed. The boy made an excellent recovery, and is now quite well.

These three cases were all treated on the same plan, which I will now describe. In the first place the operation from start to finish was carried out with strict antiseptic precautions. It would hardly be necessary to mention this but for the fact that some surgeons, once satisfied of the existence of pus or stinking fluid, appear to permit themselves considerable laxity in the details of asepsis, thinking that in the presence of unlimited quantities of septic organisms the introduction of a few additional ones is a matter of no great consequence. In the case of abdominal suppuration this is certainly a mistake, for in many cases of this kind only the bacillus coli is present, and the introduction of staphylococci or streptococci may be a fatal complication. Certainly the presence of the former in the peritoneal cavity does not necessarily prevent the primary union of the parietal wound, and if suppuration occur in this, a mixed infection, original or added by the surgeon, may be suspected.

The abdomen was in each case opened by a median hypogastric incision. Without this it is impossible either to cleanse the left flank or to drain the pelvis. On the other hand, it is not difficult to reach and resect the appendix, and complete the operation through a median incision, as was done in two of the three cases which I have quoted. In the other, I found it necessary to make a second incision over the cæcum in order to remove the appendix, although I was able to find and examine it through the median incision.

With regard to the method of removing the appendix, I believe the quickest and best way is to make a circular incision round it, about an inch from the cæcum, and, after stripping the peritoneum and subserous layer back to the cæcum like the sleeve of a coat, to ligature the denuded appendix close to the cæcum with fine silk. The appendix having then been removed and the ends of the ligature cut short, the peritoneal sleeve is drawn down and ligatured over the stump. The meso-appendix and its vessels are ligatured with a separate ligature.

The removal of the appendix I consider to be an essential part of the treatment of cases of general peritonitis. In the case of a localised abscess it is generally held, and I believe rightly, to be unwise to disturb adhesions more than necessary for fear of generalising the infection. For the same reason it is not advisable to make a prolonged search for the appendix, after opening and draining a localised abscess, and it is certain that leaving it in such cases is no bar to recovery. In general peritonitis, on the other hand, the only chance of averting a fatal result is to remove the focus of infection and as much of the toxic products as possible. In other words, the appendix must be removed and all intestinal adhesions thoroughly separated in order to liberate and remove the collections of pus and lymph among the coils. In all my cases I found and removed large quantities of pus or semi-purulent fluid, not only from the neighbourhood of the cæcum but from the pelvis and the left flank.

The abdomen was cleansed in all cases by means of sponges on holders without the use of irrigation, which I have discarded. It is quite impossible either by sponges or by irrigation to remove all the septic matter from the abdomen, and experience has shown it to be unnecessary. If the greater part be removed, together with the infective focus, the peri-

toneum can deal with the remainder, even when this is considerable. The great objection to irrigation is the danger of carrying septic matter into the upper part of the abdomen, which, as we have seen, generally remains free even in the worst cases.

After cleansing the abdomen as thoroughly as possible the wound was sutured, and a large glass tube passed to the bottom of the pelvis. In one case a gauze drain was also passed through the lateral incision down to the stump of the appendix, but I believe it was unnecessary. Very little fluid came away through the tube, except in the third case, which continued to discharge pus for over a week. The glass tube was left in for two to four days, and then replaced by a small rubber one. I am not sure that in cases of operation within 36 to 48 hours of the onset of peritonitis, like the first case, it would not be better to close the abdominal wound and dispense with drainage. This has been done successfully, but I have not yet ventured to do so.

NEPHRECTOMY AND ITS RELATION TO PREGNANCY.

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DURING the last fifteen years, the energies of surgeons all over the world have been directed extensively to the disorders of the kidney. As a result, the removal of a diseased organ has more and more frequently been resorted to with success in a very large proportion of the cases. Such a result has necessarily permitted a fairly considerable number of the population to continue their existence under vastly improved conditions, and amongst these, women have formed a large percentage. To a number of such, when restored to health, the question, whether they are justified in marrying, or, if married, in bearing children, must have presented itself. I do not propose to enter into the question of how far the loss of one kidney affects all individuals subjected to the operation, but I purpose rather to see how far that loss may be expected to influence the after-life of such small proportion of women as may become pregnant. At present I know of no data which may lead one to judge how far such a loss may affect the question of length of life—taking all individuals so operated upon from an insurance standpoint. It is, however, possible to judge to some extent of the dangers to be run by a woman, who has had to undergo nephrectomy, should she afterwards become pregnant. Particulars of six pregnancies at full term in women under these circumstances are on record, and I wish to bring before you particulars of three more such pregnancies, as well as of one case of nephrectomy during pregnancy. From these, it is possible to draw some deductions as to what risks are run by the mother, so far as her own health is concerned, during the period of pregnancy and afterwards, and also whether the development of the child is in any way affected.

The cases on record are those of Schramm¹—one confinement; pregnancy occurred 2½ years after operation; Fritsch²—one confinement; no particulars given; Israel³—one confinement; the operation having been performed on a primipara when the woman was four months pregnant; Tridondani⁴—three pregnancies in the same woman; first confinement thirteen months after operation. In my three cases one woman has had one pregnancy, another has had two pregnancies, whilst in the third the operation was performed while the woman was in the third month of pregnancy.

CASE I.—*Calculus Pyelitis: Nephrotomy followed by Nephrectomy. Pregnancy seven months later.*—Mrs. F., aged 32, multipara, came into hospital in July, 1893, suffering from pain and swelling in the right loin. She had had vomiting in the morning for some months, and also night sweats. Menstruation had ceased for eleven months. When examined, a tense fluctuating tumour was felt, occupying the upper half of the right side of the abdomen. Dulness on percussion was continuous with that of the liver, and palpation was painful. The woman stated that she had passed gravel at times. The urine was acid, with a thick deposit of pus. The other organs were healthy.

On August 2nd, 1893, the abscess was opened in the loin by an incision parallel to the rib. The kidney consisted of a series of cysts full of pus.

* Read before the West London Medico-Chirurgical Society.