

**ILEUS DUPLEX  
(INFLAMMATORY ENTEROCOLIC ILEUS).\***

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ON the four previous occasions when the Council of this College has honoured me by election as a Hunterian Professor, I have brought before you work which was the joint product of the laboratory and of the hospital ward. I believe that every surgeon who wishes to advance his subject ought, throughout his career, to spend a portion of his time in the laboratory, following in this respect the great example of Lister. But the segregation of pathology from practice has unfortunately tended to the exclusion of the clinician from the laboratory, and thus it comes about that he is more and more restricted to the field which Moynihan has described as the pathology of the living. On the present occasion I wish to bring before you some gleanings from that field.

**Nature and Causes of Ileus Duplex.**—Adynamic or paralytic ileus is a condition in which non-mechanical intestinal obstruction results from muscular paralysis of a length of the intestinal canal. Most surgeons recognize it, though some deny its existence. The best classification of its causes is given by Murphy<sup>1</sup> :—

1. Muscular paralysis from trauma or exposure.
2. Local traumatic peritonitis.
3. Local or general septic peritonitis.
4. Embolism of the mesenteric vessels.
5. Pylephlebitis.
6. Strangulation of pedicles by mass ligatures, with reflex intestinal paralysis.

Though adynamic ileus is well-recognized, it nevertheless remains a kind of limbo to which obscure cases may be relegated. The subject is surrounded by that indefinable haze, the result of imperfect knowledge, which to the despair of the student envelops certain chapters of surgery, such for instance as those dealing with shock or with osteo-arthritis. It can only be clarified by patient methods similar to those which have lately been applied to the group of insects known indiscriminately to Artemus Ward as "skeeters." My attempt to-day is to pin out and dissect one variety of adynamic ileus which has characters so definite that it needs a distinctive name. For reasons which will appear I propose to call it 'ileus duplex.'

In order to place you at once in possession of my point of view, and to enable you to weigh the evidence later to be adduced, I shall begin by giving a brief dogmatic description of this condition.

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\* A Hunterian Lecture delivered before the Royal College of Surgeons of England, on March 8, 1915.

*Definition.*—Ileus duplex is a condition in which, as the result of a pelvic peritonitis there is obstruction of the intestine at two points: (a) In the ileum, at a point about three feet above the ileocæcal valve; (b) In the sigmoid colon, at the junction of its iliac and pelvic portions. These are the points at which the ileum and colon respectively cross the brim of the true pelvis to enter the pelvic cavity.

The segments of paralyzed intestine are two in number: firstly, the portion of ileum contained in the pelvis, that is to say, about the lower three feet, excluding the last two inches; and secondly, the portion of the large bowel contained in the true pelvis, i.e., the lowest portion of the pelvic colon and the upper portion of the rectum.

On account of the special liability of the pelvic peritoneum to bacterial invasion, my subject is one of great importance. I deem it worthy of your attention for three main reasons: first, because the condition, though curable by appropriate treatment, in the early stage often passes unrecognized under the pseudonym of general peritonitis; secondly, because the duplex character of the obstruction, as indicated in my title, has not hitherto been appreciated; and thirdly, because, as might be expected, defects in the pathological conception of the condition have been reflected in imperfect treatment. And in this condition, delayed or defective treatment means certain death.

*Etiology.*—Ileus duplex may result from any one of the many causes of pelvic peritonitis. Restricting myself to those causes included within the scope of my own experience, it may result from:—

1. Appendicitis.
2. Ascending infection of the genital tract, gonorrhœal or septic.
3. Rupture of the bladder.
4. Carcinoma of the rectum.

To these causes may be added from the experience of my gynæcological colleagues, Messrs. Berkeley and Bonney<sup>2</sup>:—

5. Septic conditions of the pelvic genital organs (pyosalpinx, carcinoma of the cervix), or operations for their relief.

It is probable that this list is not exhaustive. For example, in cases where an inguinal or femoral cystocele has been included in the ligature during the radical cure of hernia, death from 'septic peritonitis' is a common sequel unless the accident is promptly recognized and treated. One surgeon has recorded three such fatal cases as within his personal knowledge. In a recent case of the kind in which I was called in twenty-four hours after the primary operation, and in which as a precaution I opened the abdominal cavity to drain the pelvis, there was urinary extravasation in the cellular tissue of the cavum Retzii and at the back of the bladder. The subserous tissues were evascular, and evidently on the point of sloughing. In such a case, failing the provision of drainage, it is inevitable that pelvic peritonitis must follow, and accordingly ileus duplex may be a factor in the fatal result. Thus it seems likely that further experience will extend the list of causes which I have considered.

**Ileus Duplex in Military Surgery.**—It is highly probable that in the past, cases of ileus duplex have occurred unnoticed in military surgery. The cases in which the condition is likely to occur are those in which there is a

septic bullet-wound, piercing the bladder, or otherwise involving the pelvic cavity, whether the intestine is perforated or not. The pelvic peritonitis thus set up might, it appears, very easily cause that paralysis of the ileum and pelvic colon which has been demonstrated in cases of pelvic appendicitis. In such cases the earliest signs of intestinal obstruction should be the signal for surgical intervention of the kind indicated in this lecture. I would therefore bespeak the earnest attention of military surgeons to the subject with which I am dealing. I venture to predict that before the end of the war, successfully treated cases of ileus duplex of traumatic origin will be placed on record.

**Appendicitis the commonest Cause of Ileus Duplex.**—Appendicitis is by far the most frequent cause of ileus duplex, and for obvious reasons the appendix is nearly always pelvic in position. A retrocæcal appendix may, however, give rise to it. The appendix, when sheltered behind the cæcum, does not cause a general peritonitis, but a trickle of pus may descend from it over the pelvic brim to infect the pelvic cavity. Inflammation of the normally-placed appendix is not among the causes of ileus duplex, for it will either give rise to a localized abscess, or will infect the general peritoneum and not particularly the pelvis. Accordingly, the signs of general peritonitis in such cases overwhelm those due to infection of the pelvic peritoneum.

The special liability of pelvic appendicitis to give rise to ileus duplex joins with the ambiguity of its earlier symptoms to make it perhaps the most dangerous form of the disease. I believe that its present mortality can be very appreciably lowered by a general recognition of the danger.

**Morbid Anatomy of Ileus Duplex as observed during Life.**—It frequently happens in cases of pelvic peritonitis that pus is found in the pelvis lying free among practically normal coils of ileum which, though congested, have not lost their lustre. The bowel may contain gas, its wall is not œdematous, it has evidently not lost its motor power. The peritonitis remains superficial, and the wall of the gut does not become inflamed. Drainage of the pelvis and the subsequent use of turpentine enemata suffice for the successful treatment of such cases, which form a large majority of cases of pelvic peritonitis.

In other cases, and these alone interest us to-day, the coils of the pelvic ileum, bathed in pus, show evidence of acute inflammation of the bowel wall. Their peritoneal surface is dull, intensely congested, and covered with pus and flakes of lymph. The bowel wall itself is swollen and œdematous. The affected coils are empty, passively contracted, and motionless, and between adjacent coils are sharp angular kinks, sometimes fixed by flakes of sticky lymph. My colleague, Victor Bonney, who gave what is perhaps the earliest detailed description of the condition of the ileum in these cases, noted that the bowel is flattened like a strap, and he found that it is impossible by manipulation to force the gas from the intestine above into the inflamed segment of ileum, an important observation directly showing the paralysis of the inflamed bowel.

The conditions described, which involve the lower two or three feet of the ileum, immersed in the pelvic basin of pus, extend to within about two

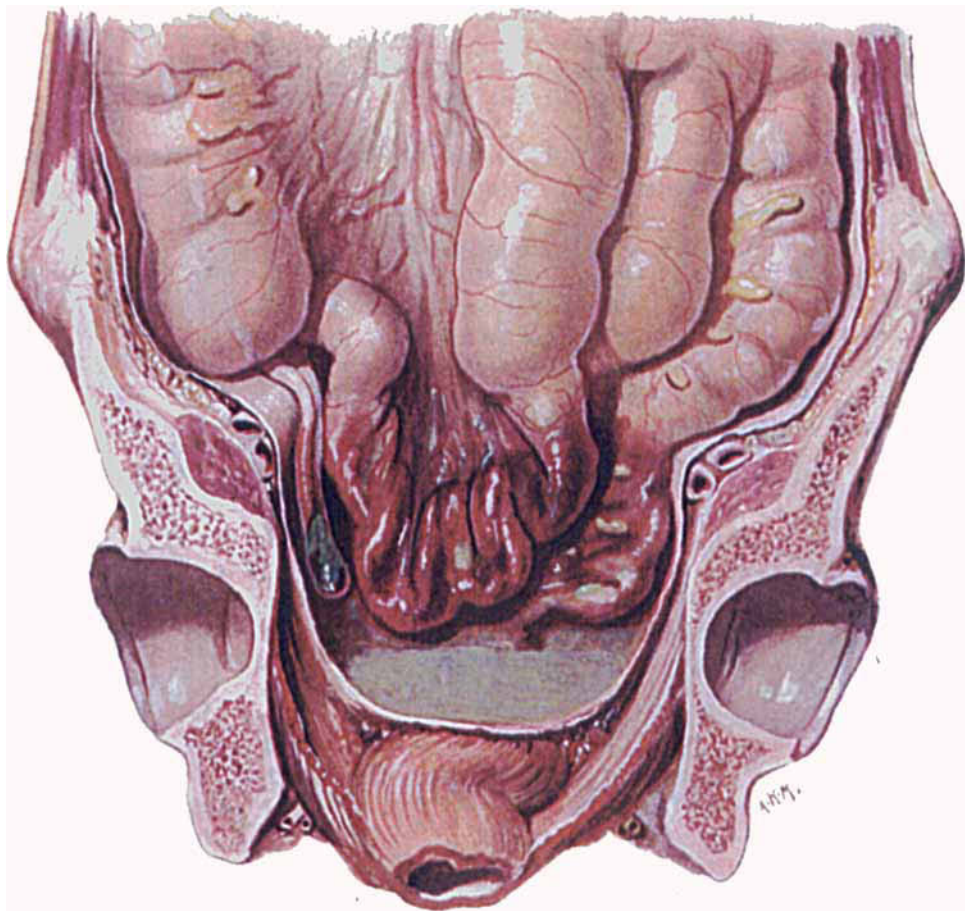


FIG. 68.—ILEUS DUPLEX ARISING FROM GANGRENOUS PELVIC APPENDICITIS.

The pelvis is occupied by a pool of pus bathing the inflamed pelvic ileum and pelvic colon. The last two inches of the ileum is normal. The supra-pelvic ileum is much distended, but is neither paralyzed nor inflamed. A fairly sharp line separates it from the inflamed portion of the ileum. There is no peritonitis above the pelvic brim.

inches of the ileocæcal valve. The terminal two inches of the small intestine, extending from the brim of the pelvis to the ileocæcal valve, is usually collapsed and normal.

This condition of the pelvic ileum may no doubt coexist with a hopeless general peritonitis involving the whole area of the peritoneum. But in the cases we are considering, the supra-pelvic abdomen, though often not shut off by any lymph barrier, affords no sufficient evidence of peritonitis, except to one obsessed by a preconceived idea. The pelvic ileum only is inflamed. Higher up, the ileum presents its normal shiny appearance, or is at most slightly congested. No pus is present amid its coils. A fairly sharp boundary line separates it from the inflamed pelvic ileum. If the case is an early one, distention is absent. Soon, however, the supra-pelvic ileum begins to be distended, owing to the block produced by paralysis of the pelvic ileum. It fills from below upwards, for I recollect one case in which the jejunum was still empty while the ileum was distended. But in what may be regarded as the typical stage of ileus duplex, the supra-pelvic small bowel, though quite uninflamed, is greatly distended owing to the obstruction lower down. That in this stage it is not paralyzed is shown by the results of treatment. It must be clearly recognized that distention of the supra-pelvic small bowel, even when accompanied by slight congestion, is not adequate evidence of general peritonitis. If, however, the case is allowed to run its course, paralysis of the distended intestine supervenes, bacterial penetration of its walls occurs, and a general peritonitis may be found at the necropsy.

We now turn to the condition of the large intestine. Usually at the time the operation is performed the large intestine shows no evidence of inflammation, perhaps because it is situated further from the inflamed appendix, and shielded from early infection by the ileal coils. Clinical evidence, however, shows conclusively that in the course of a few days the pelvic colon, though its involvement is later and less constant than that of the pelvic ileum, shares in the inflammation and paralysis which has already overtaken the small bowel. To this point I shall return later, for its recognition is essential to success in treatment.

The portion of the large bowel situated between the ileal obstruction and the obstruction in the pelvic colon usually contains some flatus, and is neither collapsed nor distended.

**Pathological Anatomy.**—In many cases after death the necropsy fails to reveal the real secret of the condition. What is found is a general peritonitis, with general paralytic distention of the intestinal tract, a misleading confirmation of the usual diagnosis made during life. At the time it was made this diagnosis was nevertheless incorrect. No series of necropsies can establish the morbid anatomy of ileus duplex. In it two processes, namely, a spreading peritonitis of pelvic origin, and an intestinal obstruction, are running a race. In the early stages seen by the surgeon the obstruction is well ahead, and there is no peritonitis above the pelvic brim; in the post-mortem room stage the peritonitis has had time to overtake it, and may be more or less generalized. Moreover, since obstruction ends in peritonitis and peritonitis in obstruction, it may pass the wit of man to say after death which was the primary and which the secondary cause thereof. ~

The recognition of ileus duplex is a product of operating-theatre pathology, not of dead-house pathology, and supplies one more example of the truth of Moynihan's belief that intra-vitam rather than post-mortem inspections are at the present day the key to further advances in knowledge.

**Clinical Signs and Symptoms.**—The signs and symptoms of ileus duplex are those of acute intestinal obstruction, superposed on those of the pelvic inflammation which has caused it. A detailed description is perhaps superfluous, but a few special points need emphasis.

Vomiting, though not invariably an early symptom, is almost a constant one. An initial vomit is the rule in appendicitis, but continued vomiting is very exceptional. It is a most useful danger signal. When repeated vomiting occurs, the possibility of ileus duplex must be promptly considered, and careful instructions must be given to the nurse to watch for and record the passage of flatus. The cessation of flatus, in spite of enema and the use of the rectal tube, establishes the diagnosis of intestinal obstruction, and if the subcutaneous injection of eserine fails, recourse must be had to operation. Owing to the late and slow onset of the large-intestine paralysis, enemata may at first succeed in relieving the parietic colon. If, subsequently, vomiting and other symptoms persist, this delusive success must be ignored, or surgical intervention will come too late.

In typical cases there is moderate general distention of the abdomen, but owing to the acute onset of the obstruction, no opportunity occurs for those intestinal gymnastics which produce visible coiling in obstructions of slower development. Visible peristalsis is absent. Abdominal rigidity is also absent, except possibly in the hypogastric region. Abdominal rigidity depends upon inflammation of the parietal peritoneum of the anterior abdominal wall, and in operable cases of ileus duplex this district of the peritoneum is not inflamed except at its hypogastric margin. Care must be taken not to mistake for true rigidity that tension of the abdominal wall which results from the intestinal inflation. Abdominal respiration is embarrassed by the general distention, but is still present.

In untreated cases, the later signs merge completely into those of general peritonitis.

**Proof of the Duplex Character of the Obstruction.**—Let me now attempt to justify the dogmatic statements I have made. Inflammatory obstruction of the lower ileum is a well-recognized condition, and this lecture will fail in its principal object unless I am able to prove that in most cases of the kind there is also an obstruction in the pelvic colon. To this point I must now direct your attention.

*Failure of Treatment if directed solely to the Ileal Obstruction.*—In cases of obstruction of the lower ileum I have found by experience that a lateral anastomosis between the ileum, some little way above the point of obstruction, and the cæcum or ascending colon is, on the whole, a very successful method of treatment, *except in ileus of inflammatory origin.*

The following table shows an extraordinary difference in the prognosis of obstruction of the lower ileum according as the obstruction is inflammatory or non-inflammatory. The contrast is even more striking than the table would indicate, for the fatal case of 'obstruction by band' recovered from the

operation, only to die of phthisis. The table indicates my experience up to about 1908.

Table I.—CASES OF ACUTE OBSTRUCTION OF THE LOWER ILEUM TREATED BY ILEO-COLIC LATERAL ANASTOMOSIS.

| CAUSE OF OBSTRUCTION                                                         | CASES | DEATHS | RECOVERIES |
|------------------------------------------------------------------------------|-------|--------|------------|
| Obstruction by the appendix acting as a band (appendix also removed) .. .. . | 5     | 0      | 5          |
| Obstruction by bands .. .. .                                                 | 3     | 1      | 2          |
| Inflammatory ileus secondary to pelvic inflammation .. .. .                  | 5     | 4      | 1          |

The extraordinary difference in the prognosis of non-inflammatory and inflammatory cases might be explained by assuming that death in the latter is due to general peritonitis and not to obstruction. But as we shall see, clinical observation does not bear out this view.

The contrast between my successful results in cases of obstruction by band, and my mortifying record of failure in inflammatory ileus, puzzled and depressed me. It seemed clear that in inflammatory ileus an unrecognized factor was at work ; but I was unable to identify it, and the text-books did not assist me. The first ray of light on the problem came in 1910 from the following case, which I shall ask you to allow me to consider in full.

*Case 8.—Pelvic appendicitis. Ileus duplex. Ileo-sigmoidostomy. Recurrence of symptoms of obstruction. Œcöcstomy. Recovery.*

At the request of Dr. Glanville, of Hampstead, I saw with him in 1910 an old lady of about 70, suffering with acute abdominal pain, rather more severe on the right side than on the left, but not definitely localized in the right iliac fossa. Chronic constipation had been a marked trouble. The temperature was slightly raised and the pulse somewhat quickened. These symptoms had been present for about twenty-four hours. There was no abdominal rigidity, nor could any tumour be felt in the right iliac fossa. There was in this region some tenderness on deep pressure. No tenderness was elicited on vaginal or rectal examination. On opening the abdomen in the middle line, within twenty-four hours of the onset of symptoms, I found a gangrenous appendix hanging down into the pelvis. It proved to be impossible to remove it without making a second incision in the right iliac fossa. The coils of the pelvic ileum were intensely congested, but there was no pus present, nor did there seem to be any indication that the congested ileum was paralyzed.

During the succeeding forty-eight hours, although the patient's pulse and general condition were fairly good, no flatus was passed, and the abdomen became much distended. It was obvious that there was complete inflammatory obstruction of the lower ileum, and that the patient would die unless something further was done. The median wound was opened up, and a lateral ileosigmoidostomy was performed as quickly as possible. Pus was found free in the pelvis, and a drainage tube was introduced to the bottom of the pouch of Douglas. Dr. Embleton, pathologist to the University College Hospital, was asked to examine the pus, and, on his advice, based on immediate microscopic examination, a large dose of anti-streptococcic serum and a stock vaccine of *Staphylococcus aureus* were administered shortly after the operation. Sixteen hours later no flatus had passed, and the patient's condition was extremely grave, indeed apparently hopeless. The pulse had become very rapid and feeble, and abdominal distention had increased. Small doses of calomel by the mouth caused sickness, and turpentine enemas

were ineffectual. Dr. Glanville urged that strong purgatives should be administered, and to this course I consented because I thought the case was hopeless. He carefully passed a stomach-tube, but it was repeatedly returned. Another anæsthetic was therefore given sixty hours after the first operation, so that the stomach could be washed out and placed in a condition to retain purgatives. Dr. Glanville then administered through the stomach-tube five grains of calomel, an ounce of magnesium sulphate, and a minim of croton oil. These heroic measures were followed the next morning by a copious evacuation, and the patient's condition then began to improve, although there was suppuration of the incisions owing to the virulence of the bacteria. An autogenous vaccine was prepared by Dr. Embleton, and administered, apparently with good results. A week later, however, abdominal distention recurred and became extreme, although flatus in small quantities continued to be passed. Partial obstruction evidently persisted, and paresis of the sigmoid below the ileosigmoidostomy was apparently the cause of it. I therefore opened the cæcum through the wound on the right side, without an anæsthetic, and tied in a catheter. The relief was immediate. From this time the patient slowly recovered strength, and she is now in excellent health, has been able to take a long railway journey, and is free from the chronic constipation which had troubled her for years before the operation. The cæcostomy closed spontaneously.

I have never seen a case recover in which death appeared so imminent and certain. The main part of the credit belongs to Dr. Glanville, who refused to despair when I had given up hope, though I may congratulate myself that my ileosigmoidostomy was able to stand the strain imposed upon it by his heroic and almost veterinary cathartics.

The successful result of this case clearly indicated to me the reason of my previous failures. In my early cases I had been dealing with one obstruction, and had ignored a second. My tentative and halting treatment of this case is obviously open to criticism in the light of my present knowledge. But it has this great value, that it affords an experimental dissection of ileus duplex into its three pathological elements—pelvic peritonitis, ileal obstruction, and colic obstruction. It is a crucial instance. In the first operation the peritonitis and its cause were treated. In spite of this the morbid picture continued to develop, and obstruction became manifest. The second operation short-circuited the small intestine obstruction. Its success was temporary only, and the purgatives which followed it produced only a transient result. The third operation, aimed at an assumed obstruction in the colon, gave immediate and permanent relief. In the first two stages the conditions present within the abdomen were determined by direct inspection. The history of this case has a demonstrative value rare in clinical work, and only attained as a rule in precise and carefully-planned laboratory experiments.

Let me remark especially that it clearly indicates three stages of the obstruction in ileus duplex :—

- a. Stage of obstruction of the ileum alone.
- b. Stage of obstruction of the ileum with paresis of the colon.
- c. Stage of complete obstruction of both ileum and colon.

The late onset of the colic obstruction is an important point, to which I must return.

But it is frequently said that one case proves nothing. Let me then draw your attention more briefly to a second and later case, *Case 11* (recorded in full on p. 181). This, too, was a case of pelvic appendicitis in a woman of



middle age, in which, though the pelvic ileum was inflamed and congested, no evidence of intestinal obstruction had manifested itself prior to the first operation. I accordingly contented myself with the removal of a gangrenous appendix, and the drainage of a pelvic collection of pus. On the fifth day after the operation complete intestinal obstruction developed. The abdomen was re-opened, a lateral ileocolostomy was performed, and, in view of the lessons of the previous case, a catheter was tied into the cæcum. After a severe struggle the patient recovered. So far this case has less probative value than the preceding one. The colic obstruction was not obvious at the operation, and a critic might assert that it would have been sufficient to short-circuit the inflamed ileum, without providing any relief by the cæcostomy for a purely hypothetical colic obstruction lower down. A very instructive incident of this patient's convalescence effectually disposes of the criticism. Shortly after the spontaneous closure of the cæcostomy opening, the abdominal distention recurred. It could not be overcome by purgatives or enemata; but after reaching a serious degree, it was spontaneously relieved by the bursting open of the recently-healed cæcal fistula.

It is impossible to inflict upon you now the detailed case-records which will be appended to the printed record of this lecture. Anticipating what I have to say on treatment, let me instead point out *Table II*, which shows that if treatment is directed only to one of the two obstructions present, death may be expected in 75 per cent of cases. But if my hypothesis of a double obstruction is acted upon, the mortality falls to 20 per cent. The evidence for the duplex character of the obstruction, derived from the two crucial cases I have given you in detail, is thus borne out by the appeal to statistical results. The fact that no two blades of grass are precisely alike, still less two cases of disease, points to the fallacy of all statistics, a fallacy which relegates them to the place of secondary or confirmatory evidence. The precise study of single cases is, in my opinion, of much greater value. But when, as in this instance, the one method of investigation confirms the other, a high degree of certainty is reached.

**Prevention of Ileus Duplex.**—Although, thanks to a general recognition of the need for prompt operation in appendicitis, the mortality of that disease is now becoming a residual one, it is susceptible of further reduction if the danger of ileus duplex is borne in mind in cases where the appendix is pelvic in position.

It is of great importance to detect and treat infection of the pelvis in its earlier stages. In every case of appendicitis, unless it is certain that the mischief is securely shut off by adhesions and confined to the right iliac region, a small median sub-umbilical incision should form the first step of the operation. With a pair of sponge-forceps a fold of gauze is carried to the bottom of the rectovesical or recto-uterine pouch. If no inflammatory fluid is present on the gauze when withdrawn, the finger with great caution explores the limits of the inflammatory mass in the right iliac region, thus gaining valuable information. The incision is then sewn up, and the appendix subsequently removed through an incision made over it in the usual way.

If the rule thus laid down be carried out, in a certain proportion of cases, even of localized appendix abscess, unsuspected dirty or semi-purulent fluid

will be found free in the pelvis. By the introduction of a drainage tube through the median exploratory incision to the bottom of the recto-vesical pouch, these cases will be saved from the pelvic abscess, or spreading peritonitis, or ileus duplex which they would probably have developed if the median incision had not been made.

When pelvic infection is found, it is a matter to be decided in each case whether to prolong the incision and remove the appendix through it, or to make a subsequent second incision directly over the offending organ.

Two other points must be borne in mind for the prevention of mortality from ileus duplex. At every operation for pelvic appendicitis, the ileum must be examined for inflammatory paresis and the supra-pelvic ileum for distention. After every appendix operation the nurse must be instructed to report carefully on the passage of flatus, for early recognition of ileus duplex is essential to its successful treatment.

**Treatment of Ileus Duplex.**—This may be conveniently studied in the light of the following table, which records the results of my experience during a period of eight years. The condition is neither rare nor common. I have met with it fourteen times among some hundreds of abdominal cases of all kinds. Though the figures of my table are small, they are, I think, very significant as to the merits of different modes of treatment. They show especially that forms of treatment which take into account only the small-intestine element in the obstruction give a high mortality. Thus, four out of six cases of simple ileocæcostomy died. The two cases which recovered indicate that the large-intestine obstruction, besides being later in onset, may not always become complete.

*Table II.*—RESULTS OF TREATMENT IN THE AUTHOR'S CASES OF ILEUS DUPLEX. 1907-1915.

|                                   | RECOVERED | DIED |
|-----------------------------------|-----------|------|
| Enterostomy .. .. .               | 0         | 1    |
| Enterostomy with ileocæcostomy .. | 1         | 0    |
| Ileocæcostomy alone .. .. .       | 2         | 4    |
| Ileosigmoidostomy .. .. .         | 0         | 1    |
| Colostomy alone .. .. .           | 0         | 1    |
| Ileocolostomy with cæcostomy* ..  | 3         | 0    |

On the other hand, I have no death to record among the three cases treated by ileocolostomy combined with cæcostomy. This is the ideal treatment. It appears to matter little whether the anastomosis is made between the ileum and cæcum, or the ileum and sigmoid, provided that in either case a safety-valve to the exterior is supplied by tying a catheter in the large intestine. I believe the anastomosis with the cæcum is safer, as being further removed from the inflamed area.

On a recent occasion, forgetful of the results of my own experience, I

\* In one of these cases the cæcostomy was performed some days after the ileocolostomy, on account of the persistence of symptoms, and with immediate relief.

performed an ileosigmoidostomy for ileus duplex without draining the cæcum. The case was one of pelvic appendicitis in a woman of advanced years, with mingled signs of pelvic peritonitis and obstruction. The pelvic ileum was obviously paralyzed, but at the time of operation the pelvic colon wore a deceptively normal appearance. Lateral anastomosis of the supra-pelvic ileum with the sigmoid was followed by some days of complete relief. But the anastomosis, subject to the strain of oncoming paresis of the pelvic colon, finally yielded, and the patient died of septic peritonitis and fæcal extravasation. So difficult is it not to forget the lessons of one's own experience.

In at least one of my cases treated by ileocæcostomy and cæcostomy, natural actions of the bowels per anum occurred within a day or two of the operation. This must not be taken to prove that the drainage of the cæcum was unnecessary. It has already been shown that the colic element of the double obstruction is late in its onset, and it must be obvious, moreover, that drainage of the cæcum will relieve distention of the large intestine, and will thus facilitate its blood-supply and tend to *prevent* paralysis of the pelvic colon.

I am prepared to admit that a cæcostomy is superfluous in a minority of cases. The recovery of two of my cases of ileocæcostomy, cases in which the cæcum was not drained, shows that the third stage, that of paralysis of the pelvic colon, does not constantly follow the others if the peritonitis is treated by pelvic drainage. But it cannot be right to trust to this in any particular case. My figures indicate that the surgeon who trusts to ileocæcostomy and peritoneal drainage alone will repent his decision in at least two out of three cases. If obstruction persists, he may still be able to save the patient by a timely cæcostomy, as two of my cases show; but the undesirability of secondary operations in patients who are acutely ill is so generally recognized as to need no emphasis. It is far better to perform simultaneous cæcostomy as a routine precaution in all cases where an ileocæcostomy is necessary.

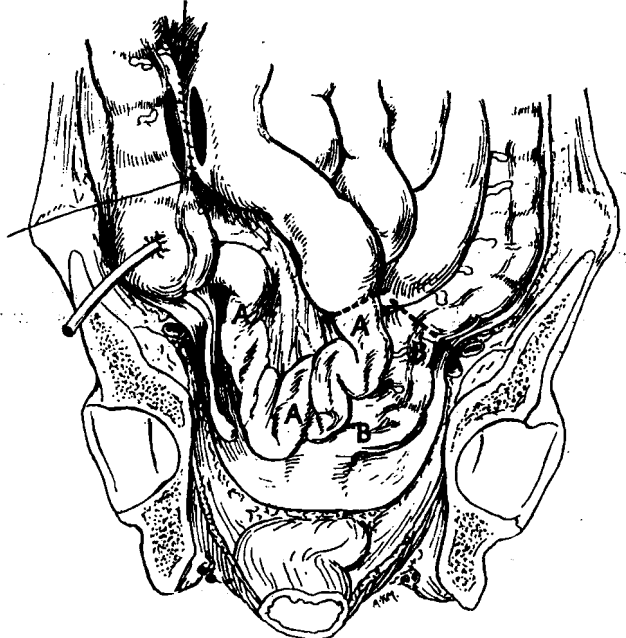


FIG. 69.—TO ILLUSTRATE THE TREATMENT OF ILEUS DUPLEX BY ILEOCOECOSTOMY COMBINED WITH CÆCOSTOMY.

A catheter has been tied into the cæcum. AAA, Paralyzed portion of small intestine. BB, Paralyzed portion of large intestine. The dotted lines indicate the level of obstruction in the ileum and in the pelvic colon.

In dealing with the large-intestine element of the obstruction, it is to be borne in mind that the obstruction is temporary only, and that in cases which recover, the large bowel will have regained its propulsive power within ten days or a fortnight at most. If during this period provision is made for the escape of gas, it appears to be unnecessary to provide for any evacuation of solids, especially as the patient will be taking only small quantities of food. For these reasons it is unnecessary to make a full-sized colostomy opening, and all needs will be met if a large rubber catheter is passed through an aperture in the wall in the colon and held in place by a purse-string suture which also transfixes the catheter. It probably matters little whether the catheter is introduced into the cæcum, or at any lower point situated above the pelvic colon. As a matter of convenience when an ileocæcostomy has been performed, the cæcum is the most accessible point to choose. Probably the best form of catheter is a so-called 'self-retaining female' catheter, since this is less likely to be blocked by fæcal débris. Should the catheter become blocked, it must be cleared by syringing through it a small amount of saline. The catheter will come out spontaneously about the fifth day, and a small cæcal fistula remains, which will rapidly close as soon as it has become superfluous.

*Enterostomy.*—The old treatment of enterostomy will no doubt occasionally save a case of ileus duplex. The method is, however, a crude and almost barbarous expedient. It is true that it removes the obstruction completely; but in order to do so it robs the patient of much of the nourishment elaborated in the upper intestine, and of most of the fluid taken by the mouth. This latter loss is the more important one. The effects of an enterostomy upon the patient's general condition may be compared to the effects of persistent vomiting. Even in cases where collapse and starvation are averted, the miseries the patient has to endure from the escape of the intestinal juices and their digestive action upon the skin are so great that the operation should, I think, never be performed except as a last resort. The evils of enterostomy may be diminished considerably if there is a free passage into the large intestine below it, and in one of my cases which recovered I performed an ileocæcostomy combined with an enterostomy; but though this patient recovered, his sufferings from dermatitis of the abdominal wall made me resolve to abandon the operation even when combined with an ileocæcostomy.

*Jejunostomy.*—In a paper to which I have already referred, Victor Bonney has advocated jejunostomy as the correct treatment for certain cases of paralytic ileus following operation, in which fæcal vomiting has made its appearance. For reasons which will appear, I think this treatment valuable, though it may prove to have a very limited range of application.

I desire to refer fully to this interesting paper for another reason, namely, that in some respects it anticipates my own observations, more especially in describing a 'primarily collapsed segment' of the bowel in cases of paralytic ileus.

It will, perhaps, be desirable to give a short summary of Bonney's paper, and to indicate the points on which I differ from him, and those on which I confirm his conclusions. In the first place, his paper restricts itself to cases of paralytic obstruction following abdominal section. Peritonitis does not appear to have been present in his cases.

He points out that flatulent distention and loss of intestinal tone is common during the first forty-eight hours after an abdominal operation, especially when traction on the mesentery has been necessary, or the operation has been a prolonged and difficult one, and that a proportion of such cases, if not treated by the rectal tube, the use of an enema, and the hypodermic injection of eserine sulphate, would terminate in paralytic ileus. In true paralytic obstruction these measures fail to relieve the condition. The pulse-rate rises and vomiting begins, at first odourless, then brownish and sour-smelling, and finally definitely faecal. Bonney holds that the likeness of the symptoms produced to those that arise from organic obstruction depends upon the fact that in both forms the chief factor in the clinical condition is an acute ascending infection of the upper intestinal tract by *Bacillus coli* and other intestinal bacteria. The fluid vomited is derived by rapid exudation from the intestine wall, and its faecal character is elaborated at the site of its exudation, and does not depend upon regurgitation of the contents of the bowel lower down. Accordingly, the mere removal of the obstruction, be it organic or parietic in nature, will not suffice, unless the contents of the upper intestine are also evacuated. Bonney believes that, while in organic obstruction the bowel above is always at first in a hyper-active state, making violent colicky efforts to overcome the block, in paralytic obstruction the intestinal wall is from the first inactive and incapable of peristalsis. It will be seen that Bonney apparently regards the whole length of the intestinal tract as sharing in the paralysis. In my view this condition of total paralysis is only met with in cases of general peritonitis, or in the last or ante-mortem stage of intestinal obstruction. It is, I think, of great importance to realize that in the earlier stages the actual paralysis of the gut is limited to certain definite segments. Mr. Bonney goes on to say that he and Mr. Comyns Berkeley have found that in cases of the kind he is considering, the bowel may be divided into three segments, each of which is in a different condition: (1) A primarily collapsed portion; (2) A portion above it which is distended with gas but contains no fluid matter; and (3) A portion above that, distended with fluid matter faeculent in character and identical with that vomited. The segment of primary collapse may, he says, be situated in the lower intestine, but it most usually affects the end of the ileum.

In regard to treatment, he states that it is proper in these cases to open the upper fluid-containing segment, and useless to open the middle gas-containing segment; that is to say, he advocates treatment by jejunostomy. He records a successful case in which this treatment was adopted. The patient had been operated upon for advanced carcinoma of the cervix. Parietic obstruction showed itself within twenty-four hours, and within forty-eight hours faecal vomiting was present. The wound was re-opened. The last three feet of the ileum were collapsed and flattened, as were also the caecum and the ascending and transverse colon, although the sigmoid contained gas in about normal amount. [The absence of any record of inflammation of the wall of the collapsed bowel leaves me in doubt whether Bonney's cases are exactly comparable to my own.] Above the segment of primarily collapsed bowel, the rest of the small intestine was greatly distended. There was no peritonitis. A gauze tube was inserted into the jejunum; the vomiting

immediately ceased, and gave place to a profuse flow of dark fæculent fluid through the tube, continuing for forty-eight hours. At the end of this time, normal jejunal contents, deeply bile-stained, began to be passed, and mouth-feeding was started. But all food taken was passed undigested through the opening within a few minutes of its ingestion, and a few days later, as the patient was approaching a condition of starvation, the wound was re-opened, the jejunal coil was freed and resected, and the operation was completed by an end-to-end anastomosis. The patient recovered.

It will be noted that this treatment is advocated by Mr. Bonney for cases only in which fæcal vomiting has begun. Although the symptom of fæcal vomiting is included in the text-books among the typical signs of intestinal obstruction, Bonney would agree that a diagnosis should be possible, as a rule, in a much earlier stage. Possibly the operation of jejunostomy may prove to be the best means of dealing with intestinal obstruction in the late stage when fæcal vomiting is present. In my own experience patients with this symptom rarely recover, and Bonney's paper may have pointed out the best way of dealing with it.

To the large majority of cases in which the diagnosis is possible earlier, Bonney himself would not apply the treatment of jejunostomy.

**Ileus Duplex frequently mistaken for General Peritonitis.**—When signs of intestinal paresis show themselves in cases of pelvic suppuration, it is easy to jump to the conclusion that the paresis is due to the onset of a general peritonitis, and that useful interference is limited to drainage of the peritoneal cavity. In the post-operative group of cases, as a rule, drainage has already been provided, and a diagnosis of general peritonitis means the abandonment of any further effort to save the patient.

It is a remarkable fact that in the current edition of his work on *Intestinal Obstruction*, which has been the guide of more than one generation of surgeons, Sir Frederick Treves has recanted his belief in the existence of ileus paralyticus. He says: "The sole pathology of ileus paralyticus is summed up in the assumption that a portion of the bowel has become incapable of peristaltic movements, and as a result of this, acute symptoms follow. I venture to think that ileus paralyticus, as described in the text-books and in the previous edition of this book, has no clinical existence.

"How often it is that the symptoms persist and rapid death follows the liberation of a coil of intestine strangulated by a band. Such death, however, is due to peritoneal infection or septicæmia, and not to ileus paralyticus. Those, however, who still claim that ileus paralyticus exists, would maintain that the persistence of the symptoms and the final dissolution of the patient are due to the fact that the damaged coil of intestine remains paralyzed.

"I have never met with an example of such a case as this in which a diffuse peritonitis was not met with after death."

Note that the basis for Sir Frederick Treves's disbelief in paralytic ileus is to be found in the last sentence I have quoted. He assumes that the general peritonitis found, as he truly says, in all cases at the necropsy, is the sole and sufficient cause of death, and that cases of so-called 'paralytic ileus' are really cases of general peritonitis. This false assumption, based on post-mortem

pathology, is negated by a study of the order of events in the living abdomen. As I have shown, observations in the operating theatre show marked evidence of obstruction before the appearance of any signs of general peritonitis. The general peritonitis found after death is a late result of the obstruction. This conclusion is amply borne out by the successful results of treatment directed towards the short-circuiting of the segment or segments of bowel which are presumed to be paralyzed. On Sir Frederick Treves's hypothesis, such treatment would be absolutely useless.

The evidence on this point derived from my cases of ileus duplex is fortified by a consideration of the results of short-circuiting operations in cases of obstruction by band. It has been my practice in such cases, wherever there was definite evidence of strangulation, and after the band had been divided, to short-circuit the affected loop by a lateral anastomosis. In cases thus treated I have found that recovery is the almost invariable rule.

The question is not merely one of academic interest. To label a case of ileus duplex as general peritonitis is to make a prophecy, not a diagnosis. In the course of a few days that prophecy will deplorably fulfil itself at the cost of the patient's life. I submit that upon the question at issue the views of Sir Frederick Treves may be rightly described as reactionary, and dangerous in proportion to the distinction and authority of their author.

**Diagnosis of Ileus Duplex from General Peritonitis.**—Some of the ordinary criteria which distinguish general peritonitis from intestinal obstruction fail in the case of ileus duplex, since, in addition to the obstruction, pelvic peritonitis is also present. Thus general peritonitis and ileus duplex present a close general resemblance. In both conditions there are general distention, vomiting, complete constipation, raised temperature, and rapid pulse, with abdominal pain and distress, and embarrassed abdominal respiration. The points of difference between the two conditions, though few in number, are happily sufficient to distinguish them. In general peritonitis general rigidity of the anterior abdominal wall is the rule. In ileus duplex rigidity is absent, or is present only in the hypogastric region. Moreover, the diffuse tenderness of the whole abdomen which characterizes general peritonitis is not found in ileus duplex; nor does the pulse, however rapid, present the wavering quality of the peritonitic pulse.

When I speak of these differences, you will understand that I refer to the earlier stages. Ileus duplex is no exception to the rule that intestinal obstruction ends in general peritonitis.

### CONCLUSIONS.

Let me now attempt to sum up my conclusions. Peritonitis of the serous surface of the intestine, when it reaches a certain degree, is accompanied by complete paralysis of the involved segment of intestine. General peritonitis means general paralysis of the intestine, and is accordingly not amenable to surgical treatment. But if the peritonitis is partial, though unlimited by any adhesion-barrier, certain segments only of the intestine are paralyzed. If the paralyzed segments can be thrown out of circuit by surgical measures, recovery is in such cases possible and even likely. Unfortunately, in these

cases the surgeon's hand has been paralyzed by a facile assumption, based upon the general abdominal distention, that general peritonitis is present.

The position of the subject in 1903 is thus summed up by Douglas: "Post-operative sepsis resulting in peritonitis produces paresis of the muscular wall of the intestine, and the resulting intestinal obstruction is the conspicuous symptom of the general peritonitis. In septic peritonitis, with conspicuous symptoms of obstruction, experience has taught us that secondary operations are so uniformly fatal that surgeons are discouraged in undertaking them. . . . Enterostomy has been frequently done without avail."<sup>3</sup> This pessimistic view was held by Douglas—though he recognized that the paralysis might involve only small segments of bowel—because he wrongly assumed the presence of general peritonitis in such cases.

The observations I have made in the operating theatre, and the successful results of my cases, show conclusively that septic ileus of pelvic origin is not accompanied by general peritonitis when it first comes under observation; further, that it is perfectly amenable to surgical treatment, subject to a clear recognition of the fact that two segments of the bowel are involved, and that accordingly two obstructions require to be circumvented.

It may be complained that the name ileus duplex adds a new terror to medical nomenclature. It is the acknowledged privilege of the poet to give to airy nothing a local habitation, and a name. I fail to see why the humble scientific observer, whose trammelled imagination must dance in tune with the facts of nature, may not assert at times the same right of fixing in language his comparatively dull realities. And in the present instance the name 'ileus duplex,' whatever its defects, will, I believe, give such definition and precision to the condition I have described as to hasten its general recognition, and thus help to save lives which might otherwise have been sacrificed.

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### CASE RECORDS.

#### *Case 1.*—Pelvic appendicitis. Ileus duplex. Enterostomy. Death.

On March 22, 1907, a Dutch woman, age 60, was admitted to the Middlesex Hospital with moderate general distention of the abdomen, most marked in the right iliac region. The history was vague; but distention and absolute constipation had existed for two days. There had been abdominal pain, more severe in the right side, and some vomiting. There was no visible coiling, and vaginal examination was negative. The temperature was 100°, and the pulse 96. It was thought there was a growth, with subacute obstruction. The abdomen was opened in the middle line below the umbilicus. Very distended and congested coils of small intestine, covered here and there with patches of lymph, were revealed. The hernial rings were free. A small quantity of slightly offensive flaky pus escaped from the right iliac region during an endeavour made to reach the cæcum, and here a gangrenous appendix was found extending downwards into the pelvis. There was plastic pelvic peritonitis, and the adhesion of coils of small intestine appeared to be the cause of the obstruction. The pus was washed away by a free stream of saline, and the appendix removed through the median wound. Two large drainage tubes were introduced into Douglas's pouch, and the peritoneal cavity was flushed out. As the small intestine appeared hopelessly distended, an opening was made into it near its lower end, and it was emptied by Moynihan's tube. A rubber catheter was tied into the



opening and brought out through the wound at its upper end. The small intestine, much of which had eventrated itself during this procedure, was copiously washed with saline, and returned. Six ounces of saline were given through the catheter every two hours, and a moderate amount of fluid by the mouth. The pulse after operation was about 90.

The patient died in forty-eight hours with delirium and peritonitis.

This case was probably hopeless from the first. It was one of my earliest cases, and the treatment adopted was far from being ideal. Flushing out the peritoneum was an undesirable step to take. Instead of doing an enterostomy, I should now do a lateral ileocolostomy and tie a catheter into the cæcum.

*Case 2.—Pelvic appendicitis. Ileus duplex. Ileocæcostomy. Death.*

On August 28, 1907, a man was admitted to the Middlesex Hospital with a diagnosis of appendicitis. His temperature was raised, and his pulse about 100. He had been vomiting for several days, but the vomit was not stercoraceous. There was general distention, with slight general rigidity. He had the pinched expression of an abdominal case, and his tongue was dry. Neither flatus nor fæces had been passed for several days prior to admission. No right iliac tumour could be felt, nor was there anything abnormal to be detected per rectum. Pain and tenderness were more marked in the right iliac region than elsewhere. Operation was at once performed through a long incision in the right semilunar line. The cæcum and the lower end of the ileum were found to be collapsed. The pelvic ileum was swollen, congested, collapsed, and bathed in pus. It was evidently acting as a bar to the onward passage of the intestinal contents. Higher up, the small intestine was greatly distended, and here also it was congested but had not lost its lustre. The appendix led straight down to the bottom of the rectovesical pouch, where there was a perforation surrounded by a small abscess. The appendix was removed, and a large tube was placed in the pelvis. A coil of ileum, distended but not inflamed, was now selected somewhat high up in the bowel, and a lateral anastomosis was performed between this coil and the ascending colon. The intestines were washed with saline and returned, and the incision was sewn up, the operation having lasted forty-five minutes. The salines were given every four hours per rectum, and the same evening the pulse was 96, and the patient said that he was free from pain. Signs of obstruction returned, and he died a day or two later.

This case represents pelvic appendicitis which has been allowed to reach an advanced stage. The fact that the ileum was congested as well as distended showed possibly that peritonitis was spreading upwards into the abdomen. But congestion may result from obstruction alone (see *Case 13*). The measures taken to re-establish the intestinal current were imperfect, since at the date of this case I had not appreciated the fact that there is inflammatory paresis of the sigmoid as well as of the pelvic ileum, nor had I realized the undesirability of flushing out the abdomen.

*Cases 3 and 4.—Intestinal obstruction from pelvic appendicitis.*

The notes of these cases are unfortunately lost. They were both admitted to the Middlesex Hospital, in 1907 or 1908, with a diagnosis of intestinal obstruction, which operation showed to be caused by pelvic appendicitis. In each of them the result was fatal, though lateral ileocolostomy was performed. Drainage of the large intestine (cæcostomy) might perhaps have saved them, though both were late cases; but at the time they occurred I had not realized its importance.

*Case 5.—Traumatic rupture of the bladder. Ileus duplex. Death during operation.*

A woman of middle age was admitted to the Middlesex Hospital under my care with signs of acute intestinal obstruction. No flatus had been passed for several

days. The abdomen was generally distended, but was only rigid in the hypogastric region. Here an indefinite resistance suggesting a distended bladder was present; but when a catheter was passed, only a small amount of septic urine was found in the bladder. The temperature was raised, and the pulse rapid. Vomiting was frequent and offensive. There was a vague history of a blow on the abdomen ten days previously, but since that time, and until a day or two before admission, the patient had walked about and had done her house-work. The diagnosis prior to operation was one of acute intestinal obstruction of uncertain origin, with commencing peritonitis.

When the abdomen was opened by a median hypogastric incision, the small intestines above the pelvis were found much distended and congested, but they had not lost their lustre, nor was there adequate evidence of a general peritonitis. When the hand was passed down into the pelvis it encountered soft adhesions, which readily yielded and gave vent to a pelvic collection of semi-purulent fluid of strongly ammoniacal odour. The pelvic small intestine was intensely inflamed, collapsed, and evidently paralyzed. The condition of the pelvic colon was not noted. Palpation of the bladder revealed a round hole, evidently a rupture, on its posterior surface near the apex. At this moment the patient stopped breathing, the heart failed, and efforts to restore life were unavailing. It is probable, at the stage when the patient first came under treatment, that a fatal result was in any case inevitable.

*Case 6.*—Pelvic appendicitis. Intestinal obstruction of some days standing. Appendectomy and ileocolostomy. Death.

In October, 1907, at the Bolingbroke Hospital, I operated upon a man with all the symptoms of acute intestinal obstruction. The operation was delayed on account of the apparent success of an enema given on admission, but the obstruction recurred. The abdomen was generally distended, and my notes state that it resembled that of a large intestinal obstruction becoming acute, except for the absence of visible peristalsis. A gangrenous appendix was found in the pelvis. The colon was loaded. The upper part of the small intestine was greatly distended, while the lower ileum was intensely congested and inflamed. No pus was present in the peritoneal cavity, but flakes of plastic lymph were present all over the pelvic peritoneum. Appendectomy and ileocolostomy failed to relieve the obstructive symptoms, and the patient died.

*Case 7.*—Suppurative salpingitis. Paralysis of the pelvic ileum. Ileocæcostomy. Recovery.

On December 3, 1908, I operated at the Bolingbroke Hospital on an actress, age 20. The history was doubtful and misleading, but for forty-eight hours she had suffered from complete constipation, in spite of enemata, and from bilious vomiting. The abdomen was flat and rigid, the temperature raised, and the pulse quick. The question of a ruptured gastric ulcer was raised, but there was no gas in the abdomen, and there were no localizing signs. There was a history of gonorrhœa, and a vaginal discharge was present.

The abdomen was opened in the middle line just below the umbilicus. The peritoneum was thickened and œdematous, and bled very easily. A little turbid fluid escaped on opening the peritoneum. A finger cautiously introduced upwards found normal and unadherent viscera, except that the small intestine was much distended. Gauze was packed in to protect the upper part of the abdomen, and the incision was prolonged to the pubes. Here the coils of the intestine were glued to each other by recent adhesions, and one or two collections of turbid fluid were evacuated from between them. The pelvis was filled by coils of intensely inflamed and congested small intestine, covered with yellowish lymph, which presented here and there very sharp kinks between the adjacent coils. This part of the bowel was very œdematous, but not distended. The inflammation invaded the lower three feet of the ileum, but its lowest four inches were normal and collapsed, as was also the cæcum. The appendix was normal. Above the inflamed part of the ileum there was very great distention of the small intestine, but its surface was smooth and not congested. With some difficulty the Fallopian tubes were brought up. They were behind, and intensely inflamed and swollen. Clearly the case was one

of ascending genital inflammation, with complete inflammatory obstruction of the ileum. Two large tubes were placed in Douglas's pouch. The ileum in the inflamed part was anastomosed laterally with the cæcum. Within forty-eight hours the patient had a normal motion, and had lost her pain and discomfort. A free discharge of pus took place for three weeks through the pelvic drainage tubes. The patient ultimately made an excellent recovery.

*Case 8.—This has been recorded in full on p. 167.*

*Case 9.—Pelvic appendicitis. Ileus duplex. Ileocæcostomy. Recovery.*

Abraham M., age 19, was admitted to the Middlesex Hospital on October 7, 1911, with a history that early in 1910 he had suffered with pain in the right iliac region for about a week. The day before admission an exactly similar pain returned, and he vomited several times. No flatus had been passed for twenty-four hours before admission. The pain became general over the lower part of the abdomen, and he passed a very restless night. On his admission at 7.0 p.m. his temperature was normal; and his pulse 128. The abdomen did not move well with respiration. It was slightly tender all over, very tender and slightly rigid over the right iliac fossa. In the rectum a small swelling could be felt on the right side. The whole rectum was very tender. Save for the slight rigidity in the right iliac region, the case would probably have been diagnosed as one of non-inflammatory intestinal obstruction. The abdomen was opened in the middle line, and pus of a faintly foetid odour escaped. A drainage tube was introduced into the pelvis. A second incision was made internally to the right anterior superior spine, and the appendix was found passing downwards into the pelvis. The tip was swollen, perforated, and gangrenous. The lower loops of the ileum hanging down into the pelvis were œdematous, swollen, and congested, but collapsed rather than distended. Above these loops the ileum was considerably distended, but not inflamed. It was evident that complete obstruction was present. A lateral anastomosis was carefully made between a distended coil of ileum and the cæcum.

The after-treatment included, as usual, Fowler's position and rectal saline. The following day the patient was much better, and flatus passed freely from the bowel; the day after, the pulse fell to 88.

Staphylococci and Gram-positive diphtheroid bacilli were found in culture.

The patient made a good recovery, and left the Hospital about three weeks after the operation.

In respect to this case I would remark that probably some of the fatalities following operation for appendicitis depend upon the non-recognition of the signs of early intestinal obstruction produced in the way I have described. No operation for appendicitis should be considered complete until the condition of the ileum with respect to distention has been investigated, more especially if on enquiry prior to operation the patient states that flatus has not passed for twenty-four hours, or more. This point seems to me of great importance.

*Case 10.—Pelvic appendicitis. Ileus duplex. Ileocolostomy with enterostomy above. Recovery. Death later from acute caseating tubercle.*

William B., age 28, was admitted to Helena Ward on March 17, 1912, with a history of pain in the lower abdomen—not definitely unilateral—and vomiting, dating from March 12. The patient was a healthy-looking man with no history of previous illness.

On admission his pulse was 92 and his temperature 100.6°. An hour or two later his pulse had fallen to normal. His tongue was dry and furred; the abdomen was generally distended but not rigid, with moderate hypogastric tenderness, not more marked on the right side than on the left. No swelling could be felt in the right iliac fossa or elsewhere.

On examination by the rectum there was marked resistance on the right side, and acute tenderness. The patient also stated that he had had pain on passing urine. As regards the passing of flatus his statements were somewhat vague; but he said that he had not passed any during the last eighteen hours. A diagnosis of pelvic appendicitis was made.

On opening the abdomen, congested and distended coils of small intestine presented themselves. After packing off the upper abdomen, the finger was placed in the pelvis and about half a pint of thick, stinking pus was evacuated. Several small collections of pus were also encountered among the coils of intestine in the pelvis.

The pelvic ileum was thickened, oedematous, inflamed, and obviously paralyzed. A gangrenous appendix was found hanging into the recto-vesical pouch, and was removed. The upper ileum was now examined. It was not inflamed, but was much distended. Obviously the pelvic ileum was the cause of complete obstruction. A lateral ileocolostomy was therefore performed between the uninflamed part of the ileum and the cæcum. A catheter was then tied into the ileum just above the anastomosis, and was brought out through the upper end of the abdominal wound. Two large pelvic drainage tubes were introduced, and the abdomen was closed.

The prognosis, though not hopeless, was thought to be extremely grave. At 11.0 p.m. the patient was greatly distended, and a twenty-fifth of a grain of salicylate of eserine was injected hypodermically; flatus was passed almost immediately through the catheter. He was ordered continuous saline, and kept on passing flatus by the catheter. On March 20 the temperature rose to 102.2° and the respiration to 30, and the patient was slightly cyanosed. On examination of the chest there was absolute dullness to percussion on the right base and slight dullness on the left. Tubular breathing was audible over the right of the base, and Sir James Fowler, who saw the patient the following day, thought there was a patch of pneumonia on the right base, with fluid at the left base. He suggested aspiration of the left pleura; this was done, and two ounces of pus were drawn off. On March 24 the temperature fell to 99°, and the respiration to 22. The catheter became loose and was removed, and a fæcal fistula resulted. Subsequently the temperature, after falling to normal for some days, rose again, and remained high until the death. On March 30 the drainage tube was removed, and the wound subsequently healed except for a small hole corresponding to the enterostomy. On April 1 Sir James Fowler could find no adventitious signs in the lungs, but on April 16 Dr. Lakin found tubular breathing over the left base. Death occurred on April 20. The post-mortem examination revealed the abdominal cavity in a normal condition except for the tiny opening of the fæcal fistula. There was acute caseating tubercle over the whole of both lungs.

I am indebted to Mr. J. Titmas, Resident Medical Officer to the Putney Hospital, and formerly House Surgeon to the Middlesex Hospital, for the notes of the case.

This case must be accounted a successful one so far as the appendicitis was concerned, for the patient died of an independent disease. But I do not think that I was wise in making the enterostomy above my lateral anastomosis. The opening displayed little tendency to close, although there was the lateral anastomosis below it to minimize the escape of fluid. The discharges were very troublesome and irritating to the skin, and the patient's nutrition was not satisfactorily maintained, a fact which may have predisposed him to acute infection from some old tuberculous lesion. I am more than ever convinced from this case that an enterostomy, even when combined with a lateral anastomosis lower down, is thoroughly bad treatment in all acute abdominal conditions save in those desperate cases where it is the last resort.

*Case 11.*—Pelvic appendicitis. Appendectomy followed by signs of ileus duplex. Ileocæcostomy with cæcostomy. Spontaneous closure of cæcostomy followed by recurrence of symptoms. Immediate relief after spontaneous re-opening of the cæcostomy. Recovery.

In May, 1912, I was asked by Dr. R. Oram, of Wandsworth, to see a lady, Mrs. F., age 57. For ten years the patient had suffered at intervals from mild attacks of pain in the right iliac fossa, and had ascribed them to indigestion. For ten days she had complained of subacute abdominal pain of colicky character. On admission to the Bolingbroke Hospital her temperature was 100.4°, pulse 98, and respirations 24. The whole abdomen was tender but not rigid. The tenderness was most marked in the middle line below the umbilicus. No special tenderness was detected in the right iliac fossa, nor could a tumour be felt there. Rectal examination detected a swelling to the right of the uterus, and a diagnosis of pelvic appendicitis was arrived at. There was some difficulty in the passage of flatus, but no absolute constipation. On June 12, seventy-two hours after the onset of acute symptoms, the abdomen was opened at the outer edge of the right rectus, and a gangrenous appendix was found extending downwards almost to the floor of the pouch of Douglas. Offensive purulent fluid welled up from the pelvis. The appendix was removed, and a large drainage tube was left in the pelvic cavity, while a smaller one extended to the stump of the appendix. It was noted at the time of the operation that about two feet of the lower ileum were congested and œdematous, but as the small intestine above was not distended or inflamed, it was thought unnecessary to do a lateral anastomosis. As will be seen, this proved to be an error of judgement. On the third day the tube to the appendix region was removed. The pelvic tube continued to discharge freely a thin offensive sanguineo-purulent fluid. The temperature gradually fell, reaching normal on the fifth day. The bowels acted on the second day in response to calomel. On the fifth day the patient complained of severe colicky abdominal pain, and the abdomen became rapidly distended. Enemas and purgatives failed to produce an action of the bowels, and complete obstruction was evidently present, although there had been no vomiting.

On June 17 the abdomen was reopened by a median incision below the umbilicus. The lower three feet of the ileum were found to be acutely inflamed, and in a state of paralytic collapse. The ileum above was much distended, but not inflamed. This portion of the bowel was evacuated through a puncture, and a lateral anastomosis was made between the supra-pelvic ileum and the ascending colon, well above the zone of inflammation. A No. 12 rubber catheter was introduced into the cæcum through a puncture, and was tied in by a purse-string suture and brought out at the median incision. The after-treatment included continuous rectal saline, pituitrin, and eserine. The operation at first produced great relief, but on June 19, perhaps owing to obstruction of the catheter, distention recurred and her condition became very grave. At this time, indeed, it appeared so hopeless that I considered giving her morphia to ease her last moments. Turpentine enemas and eserine had failed to relieve the distention; but a repetition of the enema was at last followed by a free passage of flatus. On June 21, a little faecal matter was noticed oozing from both incisions, probably from leakage round the catheter. An ounce of castor oil given by the mouth produced a fluid action through the catheter. The distention was less. On June 26, the catheter in the cæcum came out, leaving a fistula. The patient, after hovering between life and death for several weeks, eventually made a good recovery, thanks mainly to the skill of my house surgeon at the Bolingbroke Hospital, Mr. L. S. McBride, and to the devotion of the nurses. The large intestine fistula closed spontaneously about the middle of July. Shortly after its closure an event occurred which proved that it had been essential as a safety-valve. The abdominal distention recurred, and the patient's condition appeared serious until she was spontaneously relieved by the bursting open of the recently healed cæcal fistula. It was again allowed to close, and no further trouble of the kind occurred.

The history of this case, like that of *Case 8*, shows conclusively that intestinal obstruction in pelvic appendicitis is not situated only in the lower ileum, but that the large intestine, or a portion of it, is also parietic.

*Case 12.—Inoperable carcinoma of rectum. Colostomy. Pelvic suppuration. Ileus duplex. Death.*

Mrs. P., age 41, in April, 1913, began to pass blood per anum. She consulted a lady doctor, who made a diagnosis of piles; but not improving under treatment, she went to see Dr. Lawson, of Hornsey, who, on examination, found a growth in the rectum and advised operation. The patient declined this advice, but remained under Dr. Lawson's care for about a year, when, owing to a change of address, she came under the care of Dr. Gardner, of Streatham. At this time she was passing considerable quantities of blood and purulent matter in the motions, and suffered much from rectal tenesmus. I first saw her in consultation with Dr. Gardner in May, 1914. At this time there was a dense mass of growth involving the peri-anal skin and extending for some distance up the bowel. Its upper limits could not be determined owing to the pain caused by examination, but it was absolutely fixed and inoperable. She was beginning to have slight distention, and the bowels were opened with increasing difficulty. It was decided to perform a colostomy, and this was done at the Putney Hospital on May 1, 1914. On the fourth day the colon was opened by Dr. Newman, since the distention was beginning to be uncomfortable. Half an ounce of castor oil was given by the mouth, and 1 c.c. pituitary was given simultaneously; but the expected relief was not obtained. Accordingly, the following day small hourly doses of calomel were given by the mouth and one-fiftieth of a grain of eserine was given hypodermically, still without result. On the sixth day one of the stitches was removed, since it appeared to be a possible cause of obstruction of the opening in the colon. A turpentine enema was given through the colotomy wound with a good result, and the abdominal distention was relieved. Again it recurred, and was again relieved by enema. On the seventh day, when I saw the patient, there was still distention and difficulty in getting an action of the bowels, and the diagnosis lay between a general peritonitis, and inflammatory obstruction of the lower end of the ileum due to a pelvic peritonitis originating in bacterial penetration of the rectum in the region of the ulcerated growth. Although distention was present, there was no muscular rigidity, and the pulse, though over 100, did not appear sufficiently rapid and peritonitic in character to lead to the diagnosis of peritonitis. My diagnosis was therefore enterocolic ileus, although in this particular case the colic obstruction was nullified by the colotomy opening. At this stage I ought no doubt to have re-opened the abdomen and performed a lateral anastomosis between the ileum and the ascending colon. The obstruction was not, however, complete, since it yielded temporarily to the use of enemata, and I was very loth to subject the patient to another operation. Eserine and enemata were continued, and on the eighth day the colotomy again acted freely; the abdomen became flat, and the patient was distinctly improved. On the tenth day she was not so well, the abdomen was again distended, and was again relieved by an enema. The pulse was more rapid, but there was no vomiting. On the eleventh day she rather suddenly became much worse, with a subnormal temperature and a feeble and rapid pulse; saline was given subcutaneously. The colotomy continued to give escape to fluid motions. The stomach was washed out at night without much result, although the fluid contained in it was greenish and offensive. The patient did not rally, and died on the twelfth day after operation.

I was present at the necropsy made by Dr. Newman. Round the colotomy wound there was a certain amount of plastic peritonitis, and some clear fluid was present in the abdomen. On passing the hand down into the pelvis, pus welled up from the region of the rectal growth. The small intestine as far down as the brim of the pelvis was markedly distended, but not inflamed. The pelvic ileum was intensely red, congested, and inflamed, with a thickened oedematous wall, and was collapsed rather than distended. The large intestine was collapsed.

This case shows enterocolic ileus arising from an unusual cause. The pelvic peritonitis was not sufficiently severe to cause absolute obstruction of the ileum, and accordingly purgatives and enemata continued to have some effect almost to the time of death. In such cases it is very difficult to decide

at what period it is advisable to abandon medical treatment and resort to operation. If, as in this case, medical treatment is persisted in, the patient may rapidly become so ill as to forbid operative interference. It would no doubt have been better to operate as soon as the diagnosis was made; but in view of the patient's miserable condition from the growth, the fatal result could not be greatly deplored.

*Case 13.*—Pelvic appendicitis. Inflammatory paralysis of the lower ileum. Ileosigmoidostomy. Temporary relief. Death from leakage at the site of anastomosis.

Lucy H., age 68, was admitted to Queen Ward, Middlesex Hospital, under my care, on Monday, October 19, 1914. There was a history of vague pain in the abdomen of about three weeks. No flatus had been passed for about forty-eight hours prior to admission, and the abdomen was more or less definitely tender and rigid in the lower part—not, however, more so on the right side than on the left. There was marked distention, and the expression was anxious. The pulse was 88 and the temperature 100°. The patient gave a history of chronic constipation extending back for years. Pelvic examination gave a negative result, except for tenderness in Douglas's pouch. The patient had vomited repeatedly, but the vomit was not faecal. The signs and symptoms were consistent either with peritonitis followed by secondary obstruction, or with a primary obstruction leading to peritonitis of the lower abdomen. In view of the patient's age a malignant growth seemed the most likely cause of the symptoms, but the possibility of appendicitis was kept in mind. Shortly after admission the abdomen was opened in the middle line below the umbilicus. Pus was found oozing up from the pelvis. On passing the hand into the latter, a gangrenous appendix was found adherent to the right wall of the pelvis and bathed in pus. A portion of the ileum which hung down into the pelvis was inflamed and oedematous. Its surface presented flakes of lymph and it was intensely congested, but this portion of the bowel was not distended. The supra-pelvic ileum was distended, but not congested or inflamed. The sigmoid flexure was carefully examined, but since the inflammatory process was more or less confined to the right half of the pelvis, it was not inflamed. The appendix was removed and a drainage tube inserted into the pelvic cavity. A coil of distended but uninfamed ileum was chosen as far down as possible, and a lateral anastomosis was performed between it and the pelvic colon. The operation was followed by slight shock, the temperature falling to 97.5°, and the pulse rising to 100. After getting back to the ward the patient had an injection of one-fortieth of a grain of eserine salicylate, and within the next few hours she had several actions of the bowels, the motions being diarrhoeal in character. This diarrhoea persisted for several days. On the third day after operation the temperature had risen to 100° at 2.0 p.m., but at 10.0 p.m. it dropped, and remained subnormal until death. At this time, no doubt, leakage occurred at the seat of the anastomosis. The pulse rose to 124. The mental aspect of the patient was bad, as she did not think her recovery probable or desirable. The stitches were removed on the morning of the tenth day, and at about 3.0 p.m. the same afternoon she became collapsed, and two hours later a faecal fistula developed, and about two pints of faeculent material escaped. She died about 9.0 p.m. Unfortunately no post-mortem examination could be obtained.

For most of the notes on this case I am indebted to Mr. I. H. Lloyd Williams.

It is probable that this case would have had a happier issue if I had followed out my routine plan of ileocæcostomy with cæcostomy. It seems likely that inflammation and consequent obstruction of the pelvic colon is later in developing than the same condition in the pelvic ileum; several of my cases bear out this inference. On the third day the paresis of the pelvic colon had become definite, with a consequent rise of pressure within the bowel which the anastomosis was unable to withstand. It is to be remarked that an anastomosis made within the inflammatory area is much more likely to

yield than one made well above the pelvis and outside the zone of inflammation. Thus for two reasons ileosigmoidostomy is unsound treatment in these cases: firstly, because inflammatory paresis may subsequently attack the bowel below it; and secondly, because the anastomosis is placed in a dangerous area.

*Case 14.*—Acute pelvic appendicitis in a patient the subject of phthisis. Paralysis of the pelvic ileum. Appendectomy with ileocæcostomy and cæcostomy. Recovery.

On January 28, 1915, I was asked by Dr. Julius Moore to see a boy, age 17, who for several weeks had complained of colicky pain in the lower abdomen. Twelve hours before I saw him he vomited, and the vomiting was repeated. No flatus had passed for thirty hours prior to operation, and he had suffered very acute pain in micturition. The abdomen was not distended. It was slightly rigid in the lower part, not more on the right side than on the left. A resistance could be felt in the right iliac fossa, probably due to enlarged glands. Rectal examination was negative. The abdomen moved with respiration. The worst feature of the case was the pulse, which during the whole day had remained at about 140. The patient had suffered from phthisis for a long time. His temperature was 102°. The abdomen was opened in the middle line, and, as was expected, a gangrenous and perforated appendix was found leading down to the bottom of the pelvic cavity. The whole of the pelvic ileum was collapsed, œdematous, and partly covered by flakes of lymph which caused its coils to adhere one to another, producing very definite and sharp kinks. The ileum above the pelvis was somewhat distended, but had not lost its lustre. It was, however, distinctly congested. A quantity of offensive pus was evacuated from the pelvis. It seemed almost certain that the case would go on to ileus duplex; I therefore performed a lateral ileocæcostomy, and tied a catheter into the cæcum, bringing it out through a stab wound. At the end of the operation the pulse was 84, and much improved. The patient was to have rectal saline and subcutaneous injections of eserine if necessary. The prognosis was thought to be very grave, since the congestion of the upper ileum seemed to indicate a spreading peritonitis. Nevertheless the patient made an excellent recovery, under the care of Dr. Vandermin, of Enfield. The catheter came out of the cæcum on the sixth day, and the cæcostomy closed spontaneously on the sixteenth day. During the time it was open it gave vent to flatus only.

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#### REFERENCES.

- <sup>1</sup> J. B. MURPHY, *Keen's Surgery*, vol. iv, 1908.
- <sup>2</sup> VICTOR BONNEY, "On Post-operative Paralytic Obstruction of the Intestine, with special reference to its Treatment by Jejunostomy," *Archives of the Middlesex Hospital*, xxi, 39.
- <sup>3</sup> DOUGLAS, *Surgical Diseases of the Abdomen*, p. 181.