

INTESTINAL DIVERTICULOSIS AND DIVERTICULITIS

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"Some men there are, who . . . love diverticulae and turne aside into crooked waies . . ."

WILLIAM STRONG, 1647.

" . . . and neither of them standeth in the full sweepe, or right course, of those Rivers, but in a diverticle, or by way."

WILLIAM LAMBARD, 1596.

Introduction

THE WORD DIVERTICULUM comes from the Latin *diverto*—I turn aside, the *-culum* being a diminutive ending, like the English *-icle*. The English equivalent to the Latin *diverticulum* is thus *diverticle*, and its literal meaning is "a small turning aside." The word was used to denote a by-pass, a lodging, or a wayside shelter, and in Elizabethan times was applied to a house of ill-repute.

The term *diverticulosis* is used to describe the condition in which multiple intestinal pouches have formed, as opposed to isolated phenomena, e.g., *diverticula* of Meckelian origin, or due to bowel reduplication over a limited area. It is a disorder of middle age, and tends to progress, the pouches becoming larger, and the pouching more widespread, as age advances. The bowel is affected mainly in two situations—the upper jejunum and the sigmoid colon.

When the upper jejunum is affected the condition tends to spread downwards, and in extreme cases, the ileum may become involved. In the colon, the condition tends to spread upwards. In advanced cases, the whole colon may be affected, including the appendix, and, very occasionally, the rectum.

There is, however, much variation in the distribution of pouches in the colon. Sometimes a cluster may be found in the transverse colon, there being few pouches elsewhere. Occasionally the sigmoid colon may be radiologically free, and the ascending colon only be affected. The pouches here, however, are rarely "thick on the ground" and tend to become rather larger than sigmoid pouches.

Though *diverticulosis* of both the colon and jejunum is probably always progressive, the rate of progress must vary very greatly in different subjects.

Colon *diverticulosis* is far more common than jejunal. My own figures, based on radiological studies are : colon 12 per cent. of all barium enema, and jejunum 0.06 per cent. of all barium meal, examinations. Most observers, however, place the incidence of jejunal *diverticulosis* nearer to 0.1 per cent. (King, 1950 ; Orr and Russell, 1951).

The duodenum itself may also rarely be the site of multiple *diverticula*, but in this connection is to be remarked because of the frequency with which a single pouch develops in the immediate neighbourhood of the

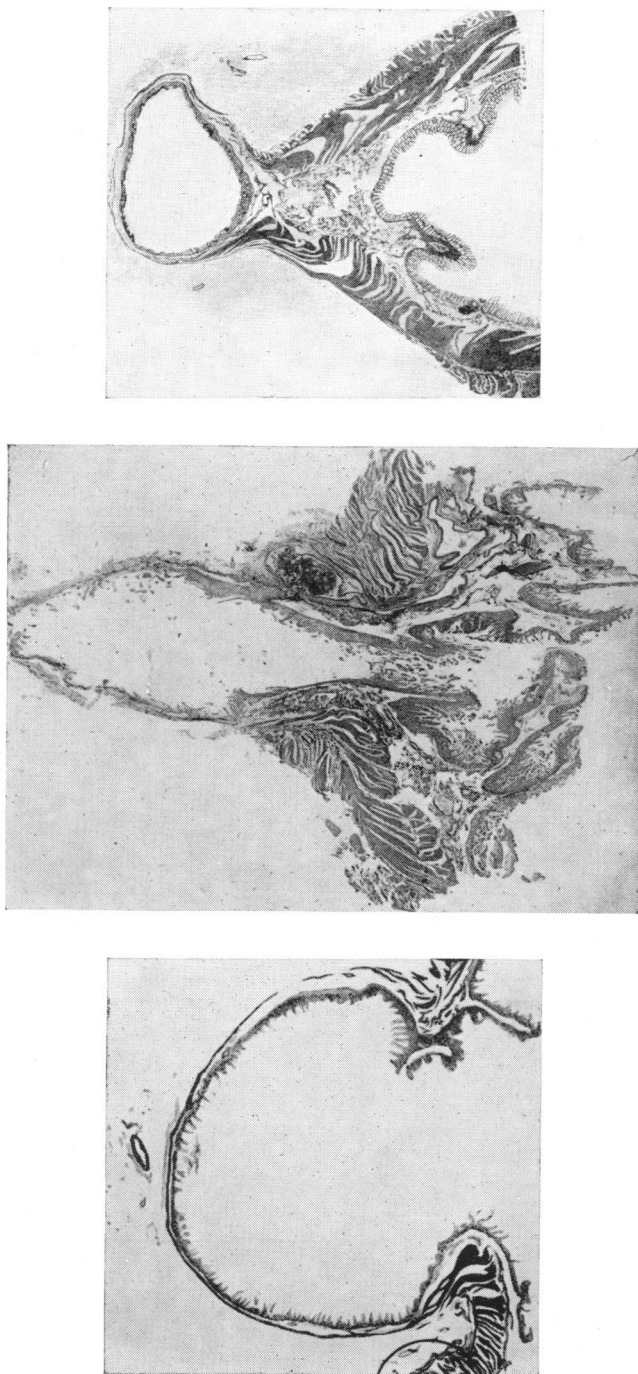


Fig. 1. Hernial diverticula from (a) Jejunum; (b) Duodenum; (c) Sigmoid colon.

ampulla of Vater. It will be found in about 2 per cent. of radiological investigations for dyspepsia upon people over the age of 45. Solitary pouches may also form at the duodeno-jejunal flexure.

Anatomy and Pathogenesis

Microscopic examination of pouches from the jejunum and the colon, and also of a solitary duodenal (perivaterine) reveals that, irrespective of situation, they all come from the same morphological "stable" (Fig. 1). When fully developed they are seen to be herniations of the mucous membrane through the muscle coat. There may be a layer of muscle fibres throughout the wall of the pouch which may be particularly well marked in a jejunal pouch. This is the muscularis mucosae, which herniates with the mucous membrane. In the jejunum it may undergo hypertrophy in order to strengthen the attenuated wall of the pouch. The presence of such a layer of muscle has, I believe, led some observers to regard jejunal diverticula as being congenital in the sense defined by Meckel, i.e., identical in structure with the intestine from which it arises, and consisting of the four coats—serosa, muscularis, submucosa, and mucosa.

It is not surprising that the bowel wall is liable to herniation when one considers the variations in pressure within the lumen of the bowel, and the fact that the integrity of the bowel wall depends largely upon its musculature. These considerations apply particularly to the sigmoid colon, where the musculature is dealing with solid or semi-solid material, pressures due to gas are high, and the muscular wall is deficient in that the longitudinal muscle coat is incomplete.

As in herniations through the abdominal parieties, weak areas in the bowel wall are exploited. These are provided by the passage of the blood vessels through the muscle coats. The perivascular areolar tissue may be weakened by deposition of fat; or "drag" may possibly be caused by hardening arteries; or venous distension may stretch these openings. All these are possible contributory causes.

That the usual site of herniation is through the vascular gap is demonstrated beyond dispute by a study of the anatomy of the blood vessels. In the jejunum, the vessels pass through the muscle coat on either side of the midline, and this corresponds exactly with the usual distribution of pouching at the mesenteric border (Fig. 2).

In the transverse and sigmoid colon the main vessels do not pierce the bowel immediately, but after division run under the serosa until the margin of the corresponding tænia is reached. They then pierce the circular muscle coat. This point of entry is the constant situation of the pouches, which in the early stages are regularly disposed in two rows, equidistant from the mesentery (Fig 3). Even in advanced cases of colon diverticulosis, where contraction of elements in the muscle coat has distorted the bowel, the same regular relation of the pouches to the tæniae can be demonstrated.

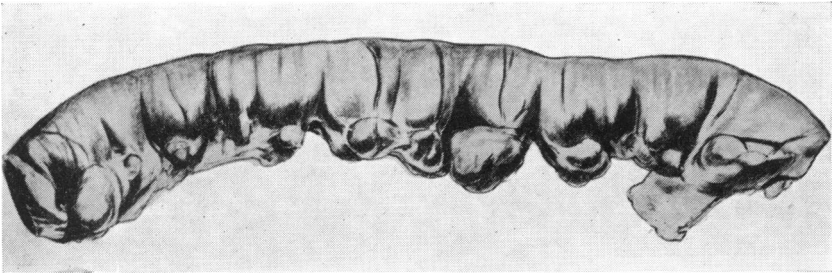


Fig. 2. Diverticulosis of the jejunum. All the pouches are from the mesenteric aspect.

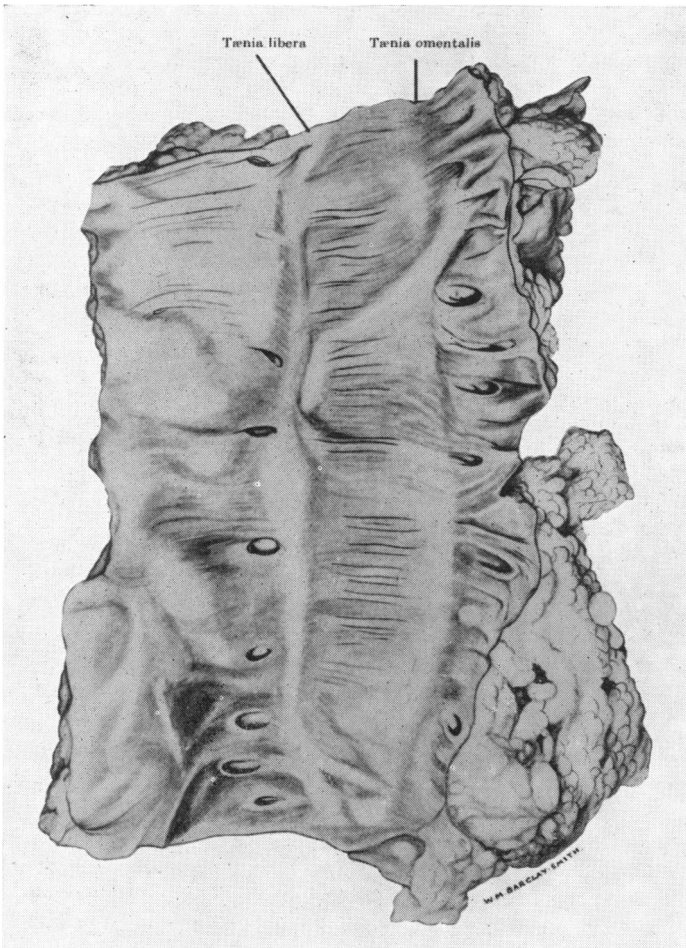


Fig. 3. Early diverticulosis of the colon. Note double row of pouches and their relation to the taeniae.

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In the ascending colon the vascular arrangement is somewhat different. Here pouches develop corresponding with branches of the main vessels, and look as though they were actually growing from them like mistletoe berries (Fig. 4).

In the case of the duodenum, the pouch (which may be paired to begin with, Keith 1910), usually passes backwards and upwards through the muscle coat in the line of the common bile duct and lies behind the head



Fig. 4. Arrangement of diverticula in relation to blood vessels, right colon.

of the pancreas. The pouch cannot therefore be seen at operation unless the duodenum is rolled over to the left.

It should not be thought that herniation can occur only along the blood vessels (or common bile duct) any more than abdominal herniation can occur only through the internal ring along the spermatic cord, or through the phrenic hiatus along the oesophagus; for pouches are sometimes found elsewhere in the small intestine than at the mesenteric aspect. I have once seen a diverticulum of the second part of the duodenum opening from the greater curvature, and Horton and Peacock (1953) have recently

recorded two such examples—both incidentally associated with another cause for symptoms, and in themselves innocent.

The same is true of the jejunum, where a pouch is sometimes found on the antimesenteric border of the bowel. But these examples are all of isolated and single pouches. Primary diverticulosis of the jejunum does not occur other than at the mesenteric aspect of the bowel. A very interesting case of diverticulosis of the jejunum secondary to infiltration of its wall by a reticulo-sarcoma was described by Williams and Fodden (1946). The pouches were disposed in a disorderly way around the circumference of the bowel, their situation being determined by the weakening of areas of the bowel wall by growth.

Pathogenesis

Acquired herniation must be due to a muscular imbalance—the intermittent high pressures within the bowel prevailing as age advances against the integrity of its wall. There is no evidence of any congenital anomaly which predisposes, any more than there is, say, to sliding oesophageal, or acquired inguinal hernia.

Although it is probable that the mechanism of herniation is the same for all three situations—duodenum, jejunum, colon—differences of anatomy and physiology would suggest that initiating factors may differ, although diverticula in all three situations may co-exist.

As regards duodenal (perivaterine), the only frequent co-existent finding noted in some 120 radiological diagnoses was visceroptosis. The duodenum is low in position and mobile, and the patients are of the spare type, with little abdominal fat. The significance of this association is unknown.

Jejunal diverticulosis is frequently associated with thickening of the wall of the affected bowel, a point to which many observers have drawn attention (Benson *et al.*, 1943 ; Phillips, 1943 ; King, 1950). I noted it in three operation specimens. In one (Fig. 5) it was particularly well marked. The whole affected bowel is large and heavy because of hypertrophy of the muscle coat, particularly of the longitudinal coat—though it may be shared also by the obscured circular coat. This hypertrophy is usual in the jejunal diverticulosis which so frequently occurs in pit ponies, particularly in those imported from Iceland (Rider, 1930). No one could doubt that this hypertrophy of the bowel is of aetiological significance.

I had previously thought it probable that spasticity was an aetiological factor in the formation of colon pouches, but the follow up of a number of spastic colon patients has failed to produce evidence in support of this concept.

Clinical Significance

The consequence of the presence of pouches unprovided with a muscle coat is retention of intestinal contents within them. When the contents are fluid and sterile, as in the jejunum, such retention is unlikely to be a

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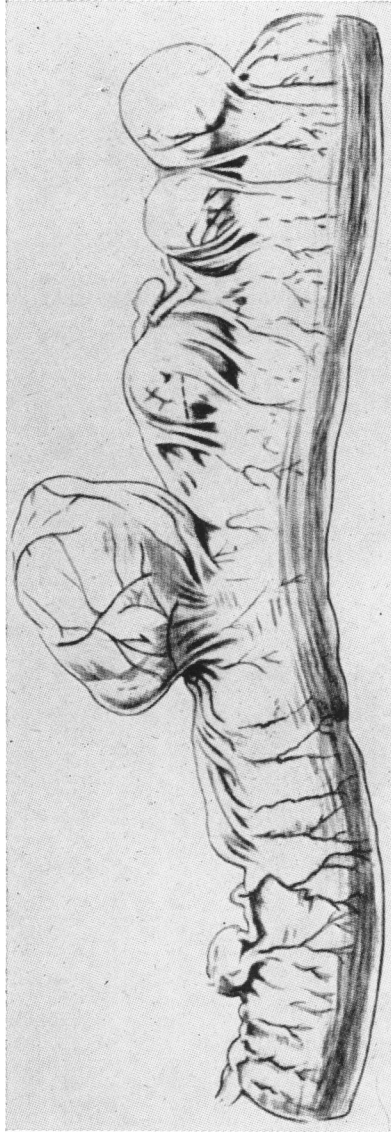


Fig. 5. Jejunal diverticulosis associated with hypertrophy of the intestine. Removed from a man of 70, who had suffered intermittent obstruction.

serious matter unless one or more of the pouches gets very large. Despite this, however, the pouches sometimes live up to the Elizabethan interpretation of a diverticulum, and the literature is dotted with examples of the most horrific happenings inside them, which may endanger life.

The semi-solid bacteria-laden contents of the colon, however, may have considerable difficulty in getting out of the small bottle-necked pouches, and retention here is thus much more likely to lead to trouble. The astonishing thing is that it does not do so more often. Colon diverticulitis causing severe symptoms is indeed rare when one considers how very commonly diverticulosis is revealed radiologically. Of a series of 133 patients known to have diverticulosis, only 19 developed symptoms demanding surgical treatment (14 per cent.). Even this figure is much too high, for the complicated cases always demand hospital treatment and are therefore found in undue concentration.

As symptomatology and complications are so much dependent upon anatomy, it will be convenient at this stage to consider the duodenum, jejunum, and colon separately.

The Duodenum

The perivaterine diverticulum is rarely responsible for symptoms, being usually a chance radiological finding during investigation of symptoms due to other causes. The criteria for operation are : (a) large size ; (b) retention

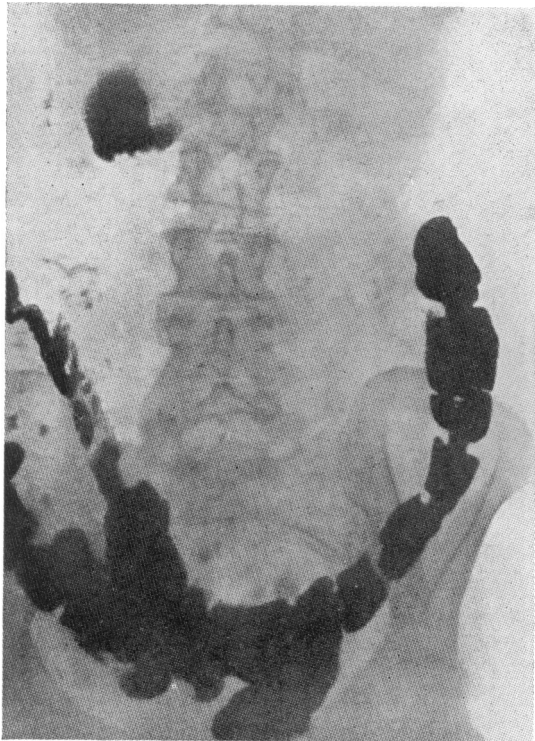


Fig. 6a. Perivaterine diverticulum showing retention 24 hours after ingestion of barium.

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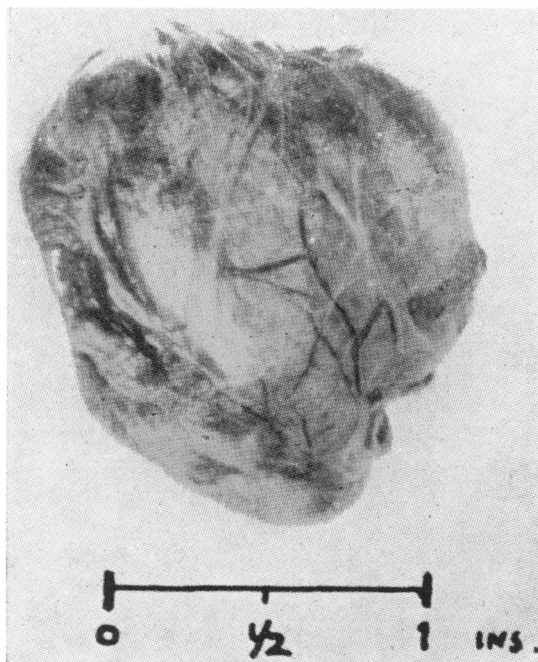


Fig. 6b. The diverticulum after removal.

of barium for 24 hours ; (c) absence of any other demonstrable cause of symptoms. In only one of a series of 80 consecutive cases was operation thought to be needed (Fig. 6).

I have no personal experience of complications such as acute inflammation, perforation, chronic inflammation, cholangitis, the presence of concretions, etc., examples of each of which will be found described in the literature.

What is of greater interest is whether a perivaterine pouch may obstruct the common bile and pancreatic ducts. Ogilvie (1941) believes it can do so, and describes four cases in which pancreatitis was associated with dilatation of the pancreatic duct and a perivaterine pouch. There are several other references to the association with pancreatitis and also with jaundice, the pouch being held responsible for causing obstruction. It is possible, however, that the pouch may result from the muscular imbalance at the ampulla which causes achalasia of the ducts. I have twice operated upon cases of dyspepsia associated with radiologically demonstrated perivaterine pouches, in which the common bile duct was grossly dilated. Both were elderly patients. One was treated by excision of the diverticulum and cholecysto-enterostomy ; and in the other a choledochoduodenostomy was done, and the pouch ignored. Both made excellent

recoveries with relief from their symptoms. I mention these cases in order to stress the importance of not undertaking treatment based on the conception that the pouch is necessarily the primary factor.

Pouches in the horizontal part of the duodenum are rare. Rowlands and King (1954) report an extraordinary case in which a duodenal diverticulum of the third part became adherent to the abdominal aorta, and killed the patient by perforating into the latter.

Duodenal diverticula of the flexure tend to enlarge quite quickly, and to pass to the right behind the peritoneum, causing kinking of the bowel. Obstructive symptoms may be caused, and the diverticulum should be removed. This will be found a simple matter, entailing less risk than the removal of a perivaterine pouch.

Jejunum

Perforation, diffuse peritonitis, adhesions, acute intestinal obstruction, concretion formation, haemorrhage, traumatic rupture, volvulus—all have been recorded as complications of jejunal pouches (Butler, 1933 ; Benson, *et al.*, 1943 ; Walker, 1945 ; Phillips, 1953 ; Mayo, 1953 ; and many others). All of course are very rare.

The most frequent serious repercussions of jejunal diverticulosis is the development of pain and vomiting suggesting chronic obstruction. X-rays will probably reveal the presence of the diverticula, and in advanced cases fluid levels may be demonstrated. If the patient now be explored, a condition illustrated in Fig. 5 may be found—a heavy hypertrophied diverticulated bowel, without actual obstruction to the lumen. The hypertrophied area may not extend throughout the whole pouch-bearing segment. This condition has been associated in two cases with steatorrhoea and anaemia resembling a “blind loop” anaemia (Witts, 1954). The surgeon should, for the purposes of treatment, regard the symptoms as due at least in part to the hypertrophied segment of bowel, rather than to the pouches alone. In other words, he ought to resect the bowel rather than remove or invert one or more of the larger diverticula, a practice which is sometimes advocated.

The Colon

It is difficult to determine the frequency with which diverticulosis becomes complicated by diverticulitis, for it is quite impossible to be sure whether minor symptoms suggestive of diverticulitis are in fact due to this cause. However, if we include under diverticulitis only the severe cases, then we see that the complication is much rarer than might be expected considering that these pouches are without muscle in their walls, and that they are subjected to being filled with semi-solid bacteria-laden faeces. Retention of faeces may occur so that the retained mass becomes completely dehydrated, and yet the diverticulum concerned remains free from inflammation. There is no doubt that the colon mucosa, provided it remains well nourished, remains completely resistant to the bacillus coli

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in spite of stagnation, and the organisms will only cause inflammatory changes if a breach in the mucosa occurs, either as a result of trauma from within the bowel, or possibly of some vascular disturbance. One of the unexplained features is that whereas diverticulosis does not discriminate between the sexes, diverticulitis is more than twice as common in men as it is in women.

Our chief concern is to prevent diverticulosis from becoming diverticulitis ; and to prevent diverticulitis from developing complications.

Management of Diverticulosis

As diverticulosis is so common and diverticulitis comparatively rare, it is probably best to keep from the patient the knowledge that diverticula have been found during a routine X-ray investigation, providing there are no symptoms. Where, however, symptoms are present—discomfort or pain, and a little tenderness in the left iliac fossa, the patient should be made aware of his condition, and treatment instituted. This is directed to resting the bowel by restricting the diet, and to reducing the tendency to retention by avoiding constipation. Lavage of the bowel is a valuable procedure if given by an expert.

Diverticulitis (Pericolitis)

Diverticulitis will vary greatly in severity, but we may regard its characteristic form as that in which the patient has pain in the left iliac fossa, with tenderness and rigidity of the muscles, a mass palpable per abdomen, per rectum, or per vaginum, and a raised temperature. Constipation is usually present, and if the lower sigmoid region is the part affected, as it usually is, there may also be frequency of micturition. The condition is usually of a recurrent or relapsing nature, each succeeding attack tending to be more severe than the previous one.

The inflammation is not in the nature of a colitis, but of a pericolitis. A mass of inflamed granulation tissue forms around or at the side of the bowel. During an "attack" the pericolic mass becomes swollen with oedema, and may contain necrotic areas (Fig. 7). The mass may sometimes feel as large as a small grapefruit, and almost as hard. With adequate treatment it may resolve, and the symptoms abate, or it may liquify to form an abscess. The abscess contents may find an outlet by bursting into a neighbouring hollow organ, or elsewhere (cp P. 382).

Management of Acute Pericolitis

Though no rules can be laid down for the treatment of acute pericolitis, the outlook should be conservative, for it is preferable by far to postpone surgery until the acute inflammation has resolved. If the signs suggest obstruction then colostomy may be unavoidable. It should be placed in the transverse colon, so as not to interfere with subsequent resection of the inflamed bowel (Lloyd-Davies, 1953), for colostomy as the sole treatment of diverticulitis ought not to be envisaged.

Treatment during the acute stage consists of rest in bed, and a fluid diet, and should be maintained until all inflammatory signs and symptoms have passed away. Antibiotics such as streptomycin or terramycin should be given during the acute phase.

Interval Operation

After recovery from an attack of diverticulitis, the question of radical operation should be considered, in order to forestall complications. Formerly this was too hazardous to be justified, but the availability of antibiotics and of phthalylsulphathiazole has to-day made it perfectly safe to perform in the well selected case. A preliminary dysfunctioning

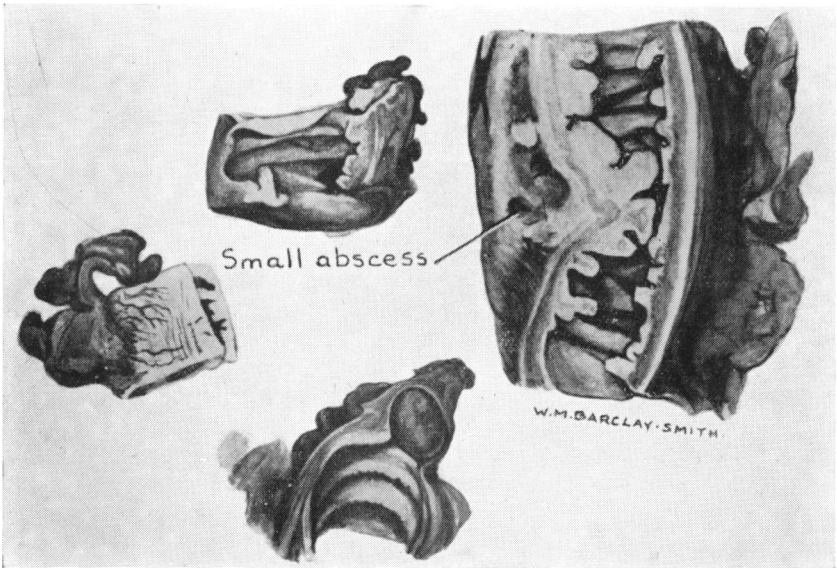


Fig. 7. Operation specimen of segment of bowel removed in the interval between attacks of diverticulitis. Note the residual abscess in the wall of the colon.

transverse colostomy may be advisable in many patients, but is not always essential. The operation consists of resection of the affected area, with end to end anastomosis (Fig. 7).

Perforation and Peritonitis

Perforation may be the first indication of the presence of diverticula in the bowel in the younger age group. A violent seizure of acute pain is followed by evidence of spreading peritonitis, which should lead to immediate laparotomy. Perforation is, however, more commonly a complication of the established condition and may be the climax of a severe exacerbation of diverticulitis. At operation a thickened and greatly inflamed colon is then found, and, though pus and faecal material and

foul-smelling gas are discovered on opening the abdomen, it may be impossible to find the actual perforation. In some such cases the peritonitis is doubtless due to rupture into the peritoneum of a pericolic abscess and the communication of the latter with the lumen of the bowel may have become sealed off.

Occasionally perforation into the peritoneal cavity, particularly in long-standing cases of diverticulitis, may cause very mild symptoms, there being little inflammatory reaction by the peritoneum. The explanation for this is not known.

The prospect of recovery after early operation for perforation will vary with the length of history of diverticulitis which precedes the catastrophe and with the degree of pericolicitis revealed at operation. The prognosis after early operation in patients with no previous history, or a history of short duration, is excellent, for the bowel wall is still flexible and the perforation can readily be found and easily closed. The closure is reinforced by omentum and the pelvis drained. In some, recovery may be complete and the patient experience no further trouble ; in others a sigmoido-cutaneous fistula may develop.

The real problem is in the surgical management of those cases in which there has been a long history of recurrent attacks of diverticulitis and in which at exploration the bowel is found to be immensely thickened and congested, and particularly in those in whom the actual point of perforation cannot be identified. In such an event the safest procedure is to exteriorize the bowel, if this is practicable. An alternative is to attempt to seal off the inflamed area with pericolic fat and omentum ; in the old and the very ill patient the operation may need to be restricted to this procedure. In others in whom there is a prospect of subsequent resection, a transverse diversion colostomy should be performed at the same time. In either event the peritoneal cavity should be drained and antibiotics given.

Abscess

Abscess formation is a very common accompaniment of recurrent diverticulitis. The abscess may be small and may not give clinical evidence of its presence, but remain buried in a thick mass of pericolic fibrous tissue. It may, however, develop quickly and form a large collection of pus under tension seeking an exit. It may burst into the peritoneal cavity, into a neighbouring hollow organ, or into the abdominal parietes on the left side. The bursting of an abscess into the peritoneal cavity usually causes acute spreading peritonitis, demanding immediate operation, the method of operative procedure being as for perforated diverticulum. The outlook for such cases is grave. Occasionally, however, evidence of rupture of an abscess may be slight and may cause little peritoneal reaction. Rupture of an abscess into neighbouring bowel may result in spontaneous relief from symptoms. Rupture into one of the female pelvic organs, and even into the ureter, has been described, but

the commonest organ to be affected is the bladder, with later development of sigmoido-vesical fistula.

The appearance of an abscess underneath the abdominal parieties is self-evident. The treatment should be limited to drainage, for this simple procedure usually results in relief from the acute symptoms of diverticulitis, though a fistula will probably persist through the drainage wound (sigmoido-cutaneous fistula). Occasionally an abscess may develop in the parieties insidiously without any preceding history of a severe attack of diverticulitis, and closely resemble a cold abscess due to tuberculous disease.

Sigmoido-cutaneous Fistula

Fistulae on to the skin, which may sometimes be multiple, are rarely spontaneous, but usually develop after opening an acute abscess, after operation for perforation, or as a complication of a radical operation upon a sigmoido-vesical fistula. Those following drainage of an abscess tend to heal spontaneously and the question of operation should, therefore, in any case, be deferred for several months. A decision will finally be needed as to whether the fistula should be allowed to remain or an attempt at cure be made. The latter must be of a radical nature, with excision of the affected bowel, for no compromise is permissible between doing nothing and the radical operation.

The decision to operate will rest mainly upon the age and general condition of the patient. The fistula may cause little inconvenience and may be well tolerated by the patient, especially if old. Its presence acts, in fact, as an insurance of some degree against the development of further inflammation. In the younger age group, and in those who find the presence of a fistula embarrassing and irksome, radical operation should usually be attempted (Fig. 8). The operation is excision of the track with the affected segment of bowel, followed by end to end anastomosis. At the present day this procedure is a safe one, and the only serious risk is recurrence of the fistula as a result of leakage from the suture line. Though it is possible sometimes to do the operation in one stage, it is usually expedient to precede the excision by a transverse colostomy, allowing some two to three months to elapse between the two operations.

Sigmoido-vesical Fistula

Diverticulitis is the commonest cause of sigmoido-vesical fistula. Usually it is a complication of recurrent diverticulitis which has been a cause of ill health for some years, though it sometimes occurs in the younger age group following a short history of diverticulitis. In 15 cases the average duration of symptoms of diverticulitis preceding the development of a fistula in the bladder was three years and nine months.

Usually the formation of a fistula is preceded by an acute attack of diverticulitis with pyrexia, the appearance of a tender mass low down in the left iliac fossa, and frequency of micturition. The tender mass is due to an abscess, which eventually ruptures into the bladder, with

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immediate relief of the acute abdominal symptoms, but exacerbation of urinary symptoms. There is severe vesical pain, with intense frequency, and the urine is heavily laden with faecal-smelling pus. There may also be haematuria. Gas, followed by faeces, may not appear for some days. In one case pneumaturia was not established as a regular feature until after many months. The interval between the rupture of the abscess and

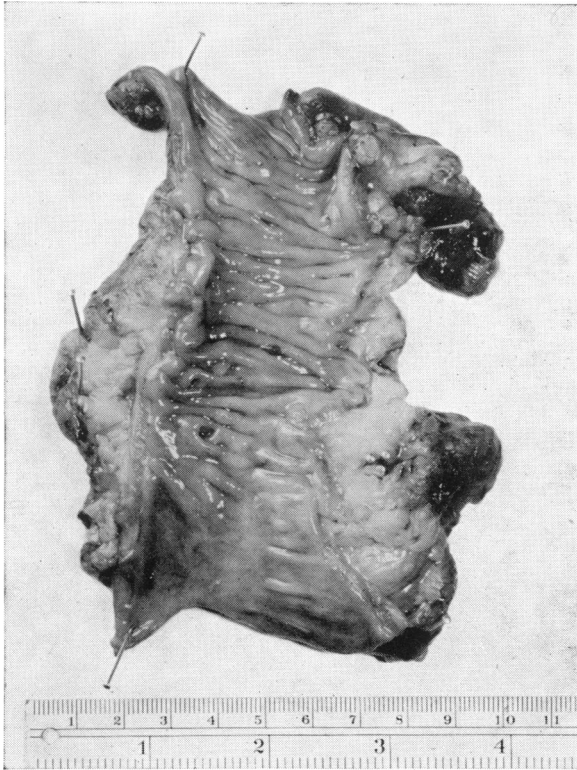


Fig. 8. Operation specimen. Resection for sigmoids-cutaneous fistula following perforation six months previously. Moderate degree of pericolicitis. Patient is a woman of 39.

the presence of faeces will depend upon the length of time it has taken to establish a fistulous track.

The acute bladder symptoms tend to subside quite quickly and may eventually disappear. After some weeks the bladder mucosa, except at the site of the fistula, will return to a normal cystoscopic appearance. After the initial outpouring of faeces the fistula is liable to close sufficiently to prevent any further escape of semi-solid material, except as an occasional incident, and the main symptom will therefore be the passage of gas per urethram.

Ascending infection of the kidney is rare, and this should be taken into account when considering treatment. Once a fistula has declared itself it is wise to defer any question of operative treatment for some months in order to allow the pericolic inflammation to subside and to allow the bladder to establish immunity. Furthermore, the fistula may, rarely, heal spontaneously.

The criteria for operation are similar to those governing sigmoido-cutaneous fistulae, with perhaps a little more emphasis upon conservatism. There should be no compromise between non-interference and radical cure. Colostomy alone is an infliction and not a cure and should not therefore be contemplated, for it adds to the patient's discomfort without necessarily affecting the fistula.

Older people, and especially in those whose fistulae developed after a long history of recurrent diverticulitis, are best advised against radical operation, though selection of cases for operation is a matter of clinical judgment and cannot be the subject of any *ex cathedra* statement. Radical cure should certainly be entertained in the younger age group of patients, and especially in those in whom there has been no great length of history of diverticulitis before the fistula developed. The principle of a preliminary transverse colostomy preceding the radical operation by two to three months should usually be followed. Temporary supra-pubic drainage of the bladder after repair of the fistula and resection of the involved bowel is desirable.

Obstruction

The mass of fibrosis which develops around the inflamed sigmoid may be responsible for producing acute small intestine obstruction as a result of adhesions. This is a rare consequence, however, and the more likely result is a narrowing of the sigmoid from contraction of the scar tissue. The state of chronic obstruction which results may closely simulate carcinoma of the bowel. Diagnosis between the two is, in fact, not always possible, though the history and the radiological appearance, particularly if a double contrast enema is used, will usually enable the differential diagnosis to be made. It is necessary to emphasize that the presence of diverticula in the colon, as revealed by the radiograph, does not preclude the possibility of new growth, for, although there is no evidence of direct causal association between diverticulosis and cancer, both are common. In a series of 162 patients with diverticulosis, nine had radiological evidence of cancer of the bowel. In other words, the diverticulosis patient is neither more nor less liable to cancer of the bowel than is the normal subject.

It goes without saying that chronic obstruction due to diverticulitis will demand surgical relief. In older people, who are poor operative risks, a short-circuit operation around the area of the obstruction is an excellent alternative to any attempt at resection. Permanent colostomy should be avoided.

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Diverticulitis of the Caecum

Since 1946, 10 patients have been operated upon at King's College Hospital because of signs and symptoms suggestive of appendicitis, in whom the appendix was found to be normal, but the caecum inflamed. In eight of these the symptoms were acute and in two of a more chronic nature. In four of them the cause of the symptoms was proven to be inflammation of a solitary diverticulum (Fig. 9). In the others, the exact



Fig. 9. Diverticulum of caecum. Man of 22. Clinically indistinguishable from acute appendicitis. Note intense inflammation of the caecal wall opposite the ileo-caecal valve, and normal appendix (operation performed by Mr. L. T. Cotton, F.R.C.S.).

pathology was difficult to determine. Some were thought to be caused by a solitary ulcer of the colon at the ileo-caecal angle, and others *probably* to inflammation of a diverticulum.

Caecal diverticulitis differs from sigmoid diverticulitis in two respects :—
(a) The age incidence is lower (one of the patients mentioned above was 22 years and another 23—the oldest was 54) ; and (b) the diverticulum is usually solitary.

The question of management of this condition is one of some importance. In two of the cases mentioned above it was possible to restrict operation to removal of the diverticulum. In most of the cases, however, the caecum was too grossly inflamed for this to be possible, and a variety of methods were adopted:—Immediate hemicolectomy (3); Paul's operation (1); closure of abdomen without drainage (1); closure of abdomen with drainage (2); short circuit (1). All patients recovered, but some needed secondary operation. One would agree with Reid (1951) that for typhlitis due to diverticulitis surgery should be conservative where possible.

The Appendix

Diverticulosis of the appendix may be part of a generalised diverticulosis affecting the whole colon. More often, however, it is secondary to disorganisation of the appendix wall by chronic inflammation. The condition was found eight times in 1,493 appendicectomies at King's College Hospital. It is of no particular clinical significance.

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ANATOMICAL MUSEUM

The display for this month consists of specimens illustrating the Products of Generation in Vertebrates. Most of these are original Hunterian preparations.