haemorrhage can usually be treated successfully by blood transfusion but sometimes requires colectomy. Less dangerous local complications are ischiorectal abscess, fistula-in-ano, and rectovaginal fistula, all of which require surgical treatment.

Another important local complication is carcinoma of the colon. This is chiefly likely to occur when the disease has been present for over 10 years, and particularly in patients with a history of severe attacks and with radiological evidence of total involvement of the colon (especially if the colitis has begun in childhood or early adult life). Patients with the distal type of ulcerative colitis do not have a greatly enhanced risk of carcinoma of the colon.

REMOTE COMPLICATIONS

Remote complications of ulcerative colitis affect many organs. Eye complications (conjunctivitis and uveitis), severe aphthous ulceration of the mouth, erythema nodosum, arthritis (usually of one or more big joints), and ankylosing spondylitis are five complications which may share a common mechanism, as combinations of two or more of them not infrequently occur in the same patients. They all respond well to corticosteroid therapy except for the ankylosing spondylitis, which is usually progressive.

Rashes are common and are sometimes complications of therapy, particularly sulphasalazine. Pyoderma gangrenosum is unusual but may be dangerous; it responds well to corticosteroid therapy.

Chronic liver disease is not unusual, and occurs quite independently of the complications just mentioned.

There are three main varieties.

Firstly, severe fatty changes are apt to accompany severe attacks of ulcerative colitis and seemingly undergo reversion to normal after the patient's general health improves. Secondly, pericholangitis (portal triaditis) is a frequent finding in ulcerative colitis and may be associated with abnormalities in liver function; some doctors⁷³ believe that this lesion can progress to chronic active hepatitis and cirrhosis, but this is not established with any certainty.

Lastly, severe chronic liver disease—taking the form of chronic active hepatitis and cirrhosis—affects only a small minority of the patients with ulcerative colitis, but the number is much greater than is found in a random sample of the population. The combination of chronic liver disease and ulcerative colitis carries a poor prognosis, and it is uncertain

if colectomy prevents the subsequent progression of the liver disease. The whole subject is discussed by Perrett *et al.*⁷⁵

Deep venous thrombosis of the legs is not uncommon in an attack of ulcerative colitis and is an indication for anticoagulant therapy to minimize the risk of a fatal pulmonary embolism. In fact, pulmonary embolism is one of the commoner immediate causes of death in the disease and, unfortunately, it is liable to occur "out of the blue" without evidence of preceding leg vein thrombosis. Possibly the pelvic veins are then the site of thrombosis and the source of embolism.

When to Abandon Medical Treatment

When caring for patients with ulcerative colitis it is of paramount importance to know when it is advisable to abandon medical treatment and resort to major surgery. In my opinion the main indications are as follows:

IN THE ACUTE ATTACK

Firstly, when there is no improvement in the patient's condition after a reasonable trial of intensive medical therapy, which may be only a few days or some weeks, depending on the clinical circumstances. A strong call for urgent surgery has been made by Goligher *et al.*⁷⁶ Secondly, perforation of the colon (always). Thirdly, acute dilatation of the colon (usually). Fourthly, massive haemorrhage from the bowel (sometimes).

CHRONIC DISEASE

Firstly, frequent disabling attacks or chronic continuous symptoms. Secondly, complications (such as severe fistula-in-ano or rectovaginal fistula) not amenable to conservative surgery. Thirdly, carcinoma of the colon.

PREVENTIVE

To eliminate the risk of subsequent carcinoma of colon in patients with universal or extensive colitis which has been present for some years, especially if the onset was in childhood or early adult life.

Surgical Treatment

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During the 70 odd years that surgeons have been treating ulcerative colitis the plan of operation has undergone very considerable alterations, mostly in the direction of making it much more radical. The first surgical manoeuvre employed was appendicostomy, in which the tail of the appendix was brought to the surface through a small incision in the right iliac region and amputated. A mucosal-lined fistulous track was thus provided between the skin and the caecum, along which a fine catheter could be passed for daily irrigation of the large intestine. After a considerable vogue appendicos-

tomy was ultimately displaced in the late 1930s by the more drastic step of ileostomy. This operation meant dividing the terminal ileum and bringing its proximal active end out as a terminal opening on the abdominal wall. Originally it was hoped that the total faecal diversion so achieved would rest the diseased large intestine and enable it to recover, so that eventually it might be possible to restore intestinal continuity. Nevertheless, it was soon discovered that complete resolution of the colitis seldom occurred and that in most cases the ileostomy had to be retained permanently. Indeed, in quite a few instances the patient failed to make a full recovery of general health or had troublesome complications till the colon and rectum were subsequently removed. Then it was found that even more satisfactory results could apparently be obtained if, at the time the ileostomy was made, the colon—or even the colon and rectum—was also excised. If the rec-

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tum was kept at the first operation it was usually removed some 3-6 months later. This procedure of ileostomy and complete proctocolectomy in one or two stages is now the one favoured by most surgeons for ulcerative colitis severe enough to require surgical treatment.

An alternative method used by some surgeons is that of colectomy and ileo-rectal anastomosis, the main attraction of which is that it avoids a permanent ileostomy. Unfortunately, as the rectum is almost invariably affected in ulcerative colitis, this operation means retaining and using a diseased segment of large bowel, which might seem likely to lead to further trouble. Most surgeons with experience of the method find that in some cases severe persistent diarrhoea or the development of anal or rectovaginal fistulas quickly bring the patient to a further operation for removal of the rectum and establishment of an ileostomy, while in others the residual inflammation in the rectal mucosa resolves completely and permanently, and the patient enjoys a most gratifying result. But most patients seem to fall between these two extremes as regards outcome—that is to say, their general health is excellent, but they have continuous or periodic inflammatory changes in the rectum on sigmoidoscopy together with a variable amount of diarrhoea and discharge of mucus and blood. Whether they are judged as successes or failures seems to depend very much on how they are assessed and also on the emotional attitude of the assessors to the alternative of a permanent ileostomy,⁷⁷⁻⁸⁰ but the results of colectomy and ileorectal anastomosis appear to be considered too unreliable by most surgeons for it to be accepted as the regular operation for ulcerative colitis. An additional disadvantage of this method is that carcinoma has occasionally developed in the diseased rectal stump after it.

Ileostomy Care

What is apt to deter patients from accepting surgical treatment for colitis is the prospect that it entails of a permanent ileostomy. Certainly in the early days of this sort of surgery they had good cause to be repelled, for reliance had to be placed on primitive and inadequate appliances, from which leakage was very common, with resulting soiling of clothing and digestion of the skin around the ileostomy. But all this has been changed by the introduction of adherent ileostomy bags of rubber or soft plastic material, which fit snugly around the projecting stoma and are firmly stuck to the skin by double-sided adhesive plasters or a special cement.⁸¹ Many patterns of appliance are available and, if properly used, they make it possible to secure an absolutely water-tight connection with the abdominal wall, so that the bag can be left in position without risk of leakage or soiling for seven to ten days, being emptied as required roughly three or four times a day.

With this arrangement patients can lead full and active lives. Most can resume their former occupations, even if these entail quite heavy physical labour, provided that they do not entail any trauma to the ileostomy itself, as in the crawling exertions of mining or in certain forms of lifting which involve resting cases or other objects against the abdomen. Similarly, in regard to sports, rugby is unsuitable because of the risk of displacement of the appliance when the patient is tackled, but tennis, golf, hockey, and even soccer are quite possible. Another recreation that is quite compatible with an ileostomy is swimming; a small adherent ileostomy bag is imperceptible under a thick-fronted swimsuit and remains securely in position despite the immersion. Finally, it should be mentioned that many young women after ileostomy and proctocolectomy have become engaged, married, and borne children.

It must be stressed that the picture painted above of life with an ileostomy is that with a *successful* ileostomy. This in turn means, firstly, a high grade of technical expertise on the

part of the surgeon to give the patient a satisfactory stoma well-suited to a modern ileostomy appliance,⁸² and, secondly, careful instruction subsequently to the patient by the surgeon and his staff in how to apply the bag and care for the ileostomy and appliances.^{81, 82} In a surgical service where very many of these operations are being done these conditions are satisfied almost automatically; in addition there may be a special "stomal therapist" available to supervise the patient's efforts. But in hospitals where ileostomy is performed only rarely small errors of operative judgement as to the siting of the stoma or its actual construction may result in a badly formed ileostomy—or more commonly the patient may be inadequately advised afterwards about ileostomy management. As a consequence recurrent leakage may occur and soon results in red oozing skin around the ileostomy and it becomes impossible to stick the appliance with ordinary adhesive plasters. Under these circumstances an invaluable preparation to secure the bag is Karaya gum, which is a good adhesive and at the same time very soothing to the inflamed skin. It may be applied as a powder to the skin and appliance and subsequently moistened to form a gel, or used in the form of a Karaya gum washer. After four to six weeks of this regimen the skin is usually sufficiently healed to take ordinary plasters again, but some patients prefer to continue indefinitely with Karaya gum as their adhesive. Patients who are having trouble with their ileostomies can get very good advice from the Ileostomy Association of Great Britain and Ireland, which is a most useful organization run for the benefit of all patients with an ileostomy. Occasionally a badly made ileostomy has to be remade before the patient can be rescued from her ileostomy difficulties.

Indications for Surgical Treatment

As a rule the initial treatment of ulcerative colitis should be medical, and the need for surgical intervention arises only when conservative measures fail. The indication for surgery may become apparent only gradually in a long-standing case or may declare itself with explosive urgency during a severe attack.²³

ELECTIVE OPERATION

In some cases the indication for operation is only too evident, as in patients who have become chronic invalids, with recurrent severe attacks and with chronic diarrhoea, emaciation, and debility, rendering them unable to work between attacks. But in other cases with less pronounced local and systemic manifestations there may be difficulty in deciding whether to advocate elective surgical intervention. An important consideration in such cases is the radiological extent of the colitis, for careful follow-up studies have shown that most patients with a total or near total colitis will eventually come to operation. It is well established, too, that the undoubted risk of malignant change in ulcerative colitis applies mainly to patients with total or extensive colitis, though it does not as a rule assume serious proportions till the disease has been present for eight to ten years. Long before that most of these patients with extensive disease are exposed to many risks to life from repeated severe attacks of their colitis and may eventually come to urgent operation during one of these attacks. The safer course as a rule is for them to accept an elective proctocolectomy during a period of remission.

The special dangers of expectant management of colitis in older people should also be borne in mind. Even with relatively distal forms of the disease affecting only the rectum and sigmoid the patients may become gravely ill with severe exacerbations, which carry a high mortality in this type of case. The advisability of an elective operation to obviate the serious risks of further severe attacks requires careful considerations.

Colitis in children poses special problems, too, for it is usually total in extent and often fails to respond to medical treatment. There is a real danger of retardation of normal physical and sexual development in young children from inadequately controlled colitis, and in the long run there appears to be a specially strong predisposition to the development of carcinoma of the large bowel. Radical surgery to prevent these developments is thus often required; fortunately, contrary to what might have been expected, children adapt themselves well to ileostomy.

Local anorectal complications in the form of abscess and fistulas are per se seldom a reason for resorting to radical operation, though they may help to strengthen the indication on other grounds, especially in older patients with severe disease. Similarly systemic complications, such as erythema nodosum, arthritis or iritis, may provide additional reasons for operation, but they are apt to occur in patients for whom there are already strong indications for radical surgical treatment.

URGENT AND EMERGENCY OPERATION

At any stage during the course of a severe attack of colitis which is being medically treated an emergency operation may be suddenly indicated by the occurrence of perforation of the colon, which will be suggested either by the appropriate abdominal signs or not infrequently only by a sudden deterioration in the patient's general condition. Another indication for immediate intervention during a severe attack is acute colonic dilatation, best detected by daily plain x-ray examinations of the abdomen in any patient undergoing conservative management of a severe exacerbation.

Barring the development of these complications medical treatment is continued in the hope of securing a remission of the attack. A controversial question is how long one should persist with a conservative regimen before abandoning hope of remission and resorting to urgent operation. Most physicians feel that if the attack has not remitted within 10 days or so of beginning intensive steroid therapy, it is unlikely to do so and surgical aid should be invoked without further delay. Even earlier intervention has been advocated by some surgeons⁷⁶ if remission has not occurred, but most patients should be given the benefit of at least a short course of medical treatment. Unquestionably urgent operation usually carries more risk than an elective one, and, if a spontaneous remission can be achieved and any operation postponed till an asymptomatic period of the illness, it will be to the patient's advantage.

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