Current Practice

Surgical Treatment of Ulcerative Colitis

J. C. GOLIGHER,* CH.M., F.R.C.S.

Brit. med. J., 1968, 2, 671-674

It is now widely accepted that surgery has an important role to play in the management of ulcerative colitis. Correctly applied, it can prevent much suffering and save many lives.

Surgical treatment for colitis began in a small way with appendicostomy to allow regular irrigation of the colon. This was gradually displaced by simple ileostomy, which provided a total faecal diversion to the surface and away from the affected bowel. But even this operation was found to be not entirely satisfactory, for it frequently proved ineffective in arresting the course of the disease, particularly during severe attacks which had failed to remit on medical treatment. Furthermore it was discovered that in long-standing cases of colitis there was a greatly increased risk of carcinoma developing in the diseased large intestine, which was thus safer removed than merely defunctioned by ileostomy. Accordingly an accepted aim of surgical treatment became excision of the affected portion of bowel, preferably at the time of the initial intervention, and this has led to the adoption of the operation of *ileostomy and proctocolectomy* in one or two stages as the method of choice at the present day.

An alternative operation, favoured by a few surgeons, is that of *colectomy and ileorectal anastomosis*. In this technique the entire colon is removed, but the rectum is retained, and the end of the ileum is anastomosed to the top of the rectal stump. No ileostomy is needed, and this is the main advantage of the procedure. If the rectum itself was frequently spared by the colitis, ileorectal anastomosis would often be a very logical and acceptable way of treating the disease. But unfortunately the reverse is the case, and—with the exception of the excessively rare so-called segmental or right-sided forms of colitis, which nearly always turn out to be examples of Crohn's disease—the rectum is practically invariably heavily affected in ulcerative colitis. So when colectomy and ileorectal anastomosis is done, it means as a rule retaining and using a diseased rectal stump, which seems to be tantamount to an invitation to further trouble either from inflammatory complications or even the development of a rectal carcinoma, as has now been recorded in a number of cases after this operation. Though Aylett¹ has reported excellent results with colectomy and ileorectal anastomosis, with some 90% of satisfied patients, most surgeons who have tried it have had failure rates of from 20% to 50%. It must be admitted that it is not easy to define "failure" in this context, and this may account for some of the discrepancies in the reports of results. Undoubtedly most patients after colectomy and ileorectal anastomosis make an excellent recovery of general health—so much so indeed that, even if they should continue to have severe changes of proctitis in the rectal stump and to suffer quite troublesome diarrhoea with up to 10 or 12 motions a day, possibly with some bleeding and discharge of mucus, they may be very reluctant to accept a further operation involving the creation of an ileostomy. My own experience of patients referred to me after unsuccessful colectomy and ileo-

rectal anastomosis elsewhere is that they have been most agreeably surprised at the much freer and more enjoyable life they have been able to lead after conversion to ileostomy.

It has been suggested that one should try most patients coming to radical surgical treatment for ulcerative colitis on colectomy and ileorectal anastomosis in the first instance, for if it fails they can then be converted to ileostomy and the rectum removed. But, as already explained, there may be great difficulty in getting the patients to accept a second operation, and if they persist indefinitely with a diseased rectal stump they are seriously exposed to the hazard of malignant change in this piece of bowel. Furthermore, conversion operations sometimes are technically quite difficult to do, for the rectum is frequently adherent and apt to be torn in the process, with resulting contamination and a high risk of postoperative morbidity.

Altogether it would be fair to say that most surgeons with extensive experience of ulcerative colitis feel that colectomy and ileorectal anastomosis is too unreliable a method for the treatment of this disease, and that if operation is to be undertaken an integral part of it must be the establishment of an ileostomy.

Indications for Elective Operation

Intractability and Chronic Invalidism

These are the commonest reasons for resorting to surgical treatment. In some instances the indication is only too evident, as in certain cases with long-standing extensive severe ulcerative colitis which has produced gross emaciation of the Belsen type and is often associated with local or systemic complications of the disease. In other cases surgery seems just as strongly contra-indicated. This is in patients with very localized distal forms of the disease confined to the rectum or rectum and sigmoid. In these cases constitutional effects are usually slight and diarrhoea may be mild or absent. The main symptom is rectal bleeding, which usually leads to the patients being referred to hospital with a diagnosis of haemorrhoids. But sigmoidoscopy shows that the rectal mucosa is thickened and granular and bleeds on contact. On passing the instrument into the upper rectum or lower sigmoid normal mucosa may be reached, or at least the barium enema examination may show that all the colon, except perhaps the distal sigmoid, has a normal appearance. For such cases of proctitis or proctosigmoiditis there is no question as a rule of operative treatment, for the patients do not usually have enough trouble to make them willing to contemplate an ileostomy. Occasionally, however, in older patients even a distal proctocolitis may be associated with sufficiently severe constitutional disturbance, diarrhoea, and possibly anal abscesses and fistulas to demand radical surgery. Also it is important to remember that a proctitis may subsequently extend proximally to involve the greater part or all of the large intestine, and may then require operative intervention.

* Professor of Surgery, University of Leeds; Surgeon, The General Infirmary at Leeds.

Between these extremes of very severe long-standing and disabling colitis, on the one hand, and mild proctitis or distal proctocolitis, on the other, there are many cases with colitis of varying degrees of severity for whom the decision for or against operation has often in the past been a very fine one indeed. One of the difficulties previously encountered in deciding in such cases was the lack of really reliable information about the outcome of continued conservative management. But this defect in our knowledge has been largely remedied recently by careful follow-up studies in Oxford^{2,3} and Leeds,^{4,5} which show that patients who have suffered attacks of colitis in the past are very likely to have further attacks in the future. These may be mild, moderate, or severe (about a sixth of them turn out to be severe). The patients especially prone to have severe attacks, which medical management often fails to arrest, resulting in a resort to urgent surgical intervention with all the hazards that this entails, are those with *total or near-total involvement* of the large bowel and those *over 60 years of age*. We find that the average mortality per year of follow-up in patients whose colon is totally involved is 2.7%, and in patients over 60 years of age it is 4.9%, even though in many of these older patients the disease is confined to the distal portion of the large bowel. The annual mortality in patients over 60 who have total involvement is 11.1%.

The immediate mortality of elective proctocolectomy in experienced hands is now of the order of 2% or 3%, to which must be added a late mortality of 2% or 3% over the next few years due to various sequels of the operation, making a total mortality of 5% or 6% for elective surgery. Clearly in cases with total involvement of the large bowel with colitis it takes only two or three years of conservative management at the most on average to exceed the hazards of operative treatment. In the light of these findings a strong case can be argued for advising elective proctocolectomy as soon as possible to all patients shown to have a total or near-total colitis, and to many patients over 60 years with more limited disease.

Risk (or Actual Development) of Malignant Change

Another danger to which sufferers from colitis are exposed is that of carcinomatous change in the diseased bowel. This risk applies especially to patients with total or substantial involvement of the large bowel who have had the disease for 10 or more years. It seems also that carcinoma is more likely to occur in patients whose colitis started in childhood. According to our findings⁶ the cumulative incidence of cancer of the large intestine in patients with total colitis reaches the staggering figure of 42% after 25 years. When colitis carcinoma does occur it carries a formidably high mortality, for it is usually of a much more active type than that ordinarily found in the large intestine and is only infrequently cured by excision. Indeed, the only really satisfactory way of dealing with it surgically is to anticipate its development by prophylactic proctocolectomy in the high-risk group of patients mentioned above, but it would be reasonable to hope that most patients with total or substantial colitis would now have their large intestine removed long before they were seriously exposed to the risk of cancer because of the other dangers of continued conservative management of extensive disease of this kind.

Obviously, too, the detection of signs suggesting that a cancer of the colon has already developed, such as a rectal or colonic stricture, strongly indicates the need for operation—unless the condition is already very advanced and inoperable.

Possible Retardation of Growth and Development

In children or adolescents continued severe colitis may retard normal development, and this consideration may be an important additional reason for advising radical operation. Some clinicians have expressed the fear that ileostomy in young

children might make life difficult for them at school and at play and lead to psychological upsets, but experience shows that as a rule it is well tolerated by youngsters, and does not have these ill-effects—which is a good thing because colitis in childhood is nearly always extensive and severe and often needs surgical treatment.

Local Anorectal Complications

Complications such as fistulas, fissures, and abscesses tend to wax and wane depending on the activity of the colitis and are seldom an indication *per se* for radical surgical treatment to the underlying bowel condition; but their presence may sometimes strengthen an otherwise doubtful indication for operation.

Systemic Complications

Remote complications such as arthritis or skin or eye lesions may also subside as the colitis improves, but they may persist or recur till operation is undertaken on the bowel. Excision of the affected intestine offers a good prospect of cure of these complications provided that all the diseased bowel is excised.

Urgent or Emergency Operations

Fortunately many severe acute attacks of colitis remit on conservative management, but when this happy outcome is not achieved in a reasonable period of time the physician looks to the surgeon for assistance. Unfortunately the results of urgent operation have till recently left a good deal to be desired, for the immediate mortality of ileostomy and colectomy or proctocolectomy performed during severe attacks has ranged from 20% to 30%. Surgeons have often felt that if the patients had been referred to them sooner during their attack when the general condition was possibly better the mortality might have been lower. But physicians have naturally been reluctant to resort to operation too soon on the grounds that this might mean inflicting an ileostomy on a patient who could possibly have secured a remission on more prolonged medical care. However, our follow-up studies have shown that this fear is largely unfounded. Most patients who manage to survive a severe attack of extensive colitis on conservative management come to operation eventually, either as an elective measure or during a subsequent attack. In the last two and a half years in Leeds we have been proceeding to urgent operation if severe attacks have not shown signs of remission on intensive medical treatment within three or four days—which happens in about 50% of the cases. Since this policy was introduced there has been a much lower operative mortality in the urgent cases, which is very gratifying, but it must be admitted that some of this improvement in the results might be due to a difference in the type of patient now presenting rather than to the earlier intervention.

At any stage during medical treatment of a severe attack, if perforation of the colon should be suspected from the development of abdominal tenderness and guarding, or, more usually, from the occurrence of a sudden deterioration in the patient's general condition, emergency operation is required. Most clinicians would now agree that the occurrence of acute colonic dilatation, which should be sought for by daily plain x-ray examination of the abdomen in patients undergoing conservative management for severe attacks of colitis, is also an indication for immediate ileostomy and colectomy.

It seems likely that the prompt use of urgent or emergency operation when indicated in severe attacks of colitis may reduce the immediate mortality of surgical intervention at this stage. But perhaps the best hope of avoiding deaths during severe attacks is to try to prevent the patients having further severe attacks by the freer use of elective operation as already advocated.

Care of the Ileostomy

Fortunately there have been marked advances in the technique of this operation and in the design of the appliances to be worn subsequently, which have much reduced the incidence of complications and helped to render this form of artificial anus acceptable to the great majority of patients. On the technical side, surgeons have learnt the paramount importance of siting the ileostomy in a position in which it will be surrounded by an area of smooth flat skin to which the ileostomy bag may be affixed. This means (Fig. 1) that it should be situated not in the line of the main left paramedian incision used for the proctocolectomy but at a separate "trephine" wound in the right half of the abdomen not too close to the umbilicus or the anterior superior iliac spine, and preferably below the level of the waist line. The great value in constructing the ileostomy of turning the end of the ileum back on itself and suturing the cut edge to the skin, as recommended originally by Brooke⁷ (1952), has been generally accepted. This method provides a nicely projecting soft ileostomy spout, which ideally protrudes 1–1½ in. (2.5–4 cm.) beyond the abdominal skin (Fig. 2).

FIG. 1

FIG. 2

FIG. 1.—Diagram showing main incision used for primary colectomy or proctocolectomy and the sites favoured for the ileostomy. Site B is preferable to A. FIG. 2.—Drawing of a well sited ileostomy. The skin around the stoma is being cleansed with ether-meth.

As regards appliances, unquestionably the most revolutionary innovation from the patient's point of view was the introduction of the Koeig-Rutzen adherent ileostomy bag, which is stuck to the skin around the stoma. Many modifications in rubber and plastic material of the original pattern of this appliance are now available, each with its own particular advantages. A popular modification is the two-piece bag (Fig. 3), in which the more rigid part, known as the flange, which surrounds the actual stoma and is stuck to the abdominal wall, can be detached from the actual bag and applied separately (Fig. 4). This has the advantage that it allows the flange to be more accurately placed on the skin so that the ileostomy projects accurately through its centre. Adhesion is secured by a double-sided adhesive plaster or a cement. The flange should be of such a

FIG. 3a

FIG. 3b

FIG. 3.—A 2-piece rubber ileostomy appliance: (a) flange and bag separate; (b) both pieces fitted together.

size that it does not grip the projecting stoma tightly, otherwise the bowel might sustain injury in the form of ulceration or fistulation during the periodical expansions of the waves of peristalsis. It is customary to tuck a "cigarette" of cotton-wool into the crevice between the wall of the flange and the ileostomy bud to prevent accumulation of faeces in this gap (Fig. 5). Once the flange has been firmly secured in position the bag is attached by stretching the hole on the upper part of its posterior surface and fitting it on to the rim near the front edge of the flange (Fig. 6). This apparently difficult manoeuvre is quickly mastered by the patient. Usually the flange is left in position for a week or longer, and the bag is changed every day to avoid any suggestion of malodour. Emptying of the bag by loosening the screw-cap near its bottom end is carried out as often as required, usually three or four times a day.

FIG. 4

FIG. 5

FIG. 4.—Applying the flange to the skin around the ileostomy, the posterior surface of the flange having been rendered adherent by the previous application of a square of double-sided adhesive plaster. FIG. 5.—Tucking a "cigarette" of cotton wool around the ileostomy bud in the moat between it and the wall of the flange.

FIG. 6a

FIG. 6b

FIG. 6.—Applying the bag to the flange: (a) the opening in the back of the bag proper has been stretched by the thumbs and its edge drawn up against the rim of the flange; (b) the bag is being drawn over the front of the flange.

Complications after Ileostomy

The commonest complication of an ileostomy is soreness of the surrounding skin, which occurs in about 10% of the cases, but is usually only transient and responds to appropriate treatment. Such soreness is most frequently due to leakage of faeces between the flange of the appliance and the skin, which allows the latter to be exposed to the action of the digestive juices in the ileal effluent. The leakage is usually caused initially by faulty application of the flange, but once the skin has become sore and oozing fixation with plaster becomes progressively more difficult and leakage more frequent, so that a vicious circle is quickly established. An invaluable preparation in breaking this cycle is Karaya gum powder. When mixed with a little water this forms a paste which sticks the appliance to the abdominal wall and at the same time exercises a soothing effect on the inflamed skin. If it is employed regularly for

three or four weeks instead of ordinary adhesives the soreness usually clears up and the use of plasters can then be resumed. Very rarely, when the leakage is due to the ileostomy having been very badly sited or poorly constructed, a further operation may be necessary to remake or resite the stoma.

Rehabilitation after Ileostomy

With modern appliances properly employed it is possible for patients with ileostomies to achieve a completely watertight attachment of their bag to the skin, which avoids all soiling and enables them to lead a full, active existence. Thus most patients are able to return to their previous occupation, even manual work, always provided that it does not expose the ileostomy itself or the appliance to injury—as in the crawling action of mining or in certain lifting manoeuvres in which objects have to be rested partly on the abdomen. Similarly recreations and sports, such as dancing, golf, tennis, hockey, and even swimming, are quite manageable, but obviously rugby football is not a suitable game for ileostomists.

The patient often finds it difficult to believe that all this will be so for her if she accepts operation, for when first contemplated by a lay person, particularly a young woman, ileostomy seems a revoltingly unnatural arrangement, likely to put paid to all romantic aspirations and even to threaten the security of a well-established marriage. The best way to allay such apprehensions is to arrange for the patient to have a heart-to-heart talk with another patient of the same sex and roughly the same age and social status who has an ileostomy.* It is

* One of the several functions of the Ileostomy Association of Great Britain and Ireland is to provide suitable ileostomists to interview and reassure patients about to undergo operation. Through its divisions in various parts of the country, the association also organizes regular meetings for its members and is available to help with advice on ileostomy appliances and management.

seldom indeed that this plan fails to secure the patient's assent to operation, or that in retrospect a patient regrets the decision to proceed to ileostomy. As for sex life, so far from the possession of ileostomy providing a bar, young women ileostomists seem to experience no difficulty in getting engaged and married and bearing children.

Figures 2–6 are taken from the booklet *The Care of Your Ileostomy*, by J. C. Goligher and M. A. Pollard, 1968.

REFERENCES

- ¹ Aylett, S., *Proc. roy. Soc. Med.*, 1963, 56, 183.
- ² Edwards, F. C., and Truelove, S. C., *Gut*, 1963, 4, 299.
- ³ Edwards, F. C., and Truelove, S. C., (1964). *Gut*, 1964, 5, 1.
- ⁴ Watts, J. McK., de Dombal, F. T., Watkinson, G., and Goligher, J. C., *Gut*, 1966a, 7, 16.
- ⁵ Watts, J. McK., de Dombal, F. T., Watkinson, G., and Goligher, J. C., *Brit. med. J.*, 1966b, 1, 1447.
- ⁶ de Dombal, F. T., Watts, J. McK., Watkinson, G., and Goligher, J. C., *Brit. med. J.*, 1966, 1, 1442.
- ⁷ Brooke, B. N., *Lancet*, 1952, 2, 102.

B.M.J. Publications

The following are available from the Publishing Manager, B.M.A. House, Tavistock Square, London W.C.1. The prices include postage.

<i>B.M.J. Cumulative Index, 1967</i> ...	Price 30s.
(15s. to B.M.A. members)	
<i>Porphyria—a Royal Malady</i> ...	Price 13s. 6d.
<i>Is There an Alternative?</i> ...	Price 7s. 6d.
<i>Treatment of Common Skin Diseases</i> ...	Price 10s.
<i>Obstetrics in General Practice</i> ...	Price 32s. 6d.
<i>Child Care</i> ...	Price 32s. 6d.
<i>Charles Hastings and Worcester</i> ...	Price 3s. 6d.

TODAY'S DRUGS

With the help of expert contributors we print in this section notes on drugs in current use.

Sulphonamides

Since Domagk's description of the antibacterial activity of prontosil rubrum in 1935 thousands of sulphonamides have been synthesized. Most of the compounds of clinical interest are antimicrobial agents, but some—for example, tolbutamide and glymidine—are antidiabetic agents and some are anticonvulsants. It was early shown that some sulphonamides are inhibitors of carbonic anhydrase, and derivatives in which this property is highly developed—for example, acetazolamide—have been used as diuretics. Some antibacterial sulphonamides may show traces of these other pharmacological activities, and potentiation of antidiabetic by antimicrobial sulphonamides has been described. The neisseriae apparently alone among pathogenic bacteria are susceptible to anti-carbonic anhydrase sulphonamides, which have been used in an attempt to control the spread of meningococcal infection.

Antimicrobial Activity

The sulphonamides are essentially bacteriostatic agents, but their antimicrobial range is the widest of all agents in clinical use. It embraces most of the major Gram-positive and Gram-negative pathogenic bacteria: *Staphylococcus aureus*, haemolytic streptococci (but not *Str. faecalis*), pneumococci, *Neisseria*, *Haemophilus*, enterobacteria, and even *Pseudomonas aeruginosa*, and extends from the agents of the trachoma-

psittacosis group at one end of the microparasitic scale to plasmodia and toxoplasmas at the other.

Mode of Action

It is evident from this astonishing range of activity that sulphonamides must interfere with some essential function which is common to widely diverse parasites. The successful clinical application of sulphonamides demonstrates that this same function cannot be essential to man. It appears that the metabolic difference on which the selective toxicity of sulphonamides rests is the mode of folic acid utilization. In both parasites and man folic acid derivatives are essential for purine synthesis, but man absorbs his requirements preformed from the diet, while parasites are unable to absorb the vitamin, and they synthesize it from para-aminobenzoic acid. The sulphonamides are structurally similar to para-aminobenzoic acid and they interfere with its uptake by parasites. The details of this action have assumed considerable importance since the discovery of compounds which block later stages in the synthesis of folic acid and hence act synergically with sulphonamides. The clinically important examples of such compounds, pyrimethamine (active against plasmodia and toxoplasmas) and trimethoprim (active against bacteria) have made it possible to treat infections apparently resistant to sulphonamides alone.

Bacterial Resistance

In several conditions for which sulphonamides were extensively used, notably the treatment of gonorrhoea and the