

Papers and Originals

Surgical Treatment of Severe Attacks of Ulcerative Colitis, with Special Reference to the Advantages of Early Operation

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Summary: The management and outcome of 258 severe attacks of ulcerative colitis from 1952 to 1969 has been reviewed. If remission did not occur during an initial course of intensive medical treatment, including administration of corticosteroids, operation (generally ileostomy with proctocolectomy or subtotal colectomy) was performed. This took place some 12 to 17 days after admission as a rule during the years 1952-63, but usually within five to seven days from 1964 to 1969.

Roughly half the attacks underwent spontaneous remission during the two periods, but the medical mortality was 4.8% in the former and 0.7% in the latter, the operative mortality 20.0 and 7.0%, and the overall mortality 11.3 and 4.5% respectively. The lowering of the mortality was particularly striking in severe first attacks and in severe attacks in patients over 60 years of age.

Perforation of the colon was found in 21 cases, or nearly 20% of 112 patients coming to operation during attacks, being commoner in the first period (32.5%) than in the second (11.1%). The immediate mortality of all such operations was 11.6%; in cases with perforation it was 28.6%.

Acute colonic dilatation was observed in 28 cases. All but one were treated by emergency colectomy, at which the colon was noted to be perforated in 11. The mortality of these operations was 18.5%.

Follow-up of the 140 patients who survived without coming to operation during their attacks shows that 52 (37.1%) subsequently underwent surgical treatment either during further attacks or electively.

Though all 258 attacks were thought at the time to be due to ordinary ulcerative colitis, subsequent pathological examination of operative specimens derived from 98 patients who came to urgent or subsequent operation during the 1964-9 period revealed that the lesion in the large bowel was Crohn's disease in 17 instances.

Introduction

The dangers to life posed by ulcerative colitis are largely concentrated in the phases of acute exacerbations or relapse which so frequently characterize the course of this disease. Fortunately these severe attacks often show a considerable tendency towards spontaneous remission, which can be to some extent encouraged by corticosteroid therapy and possibly other medical measures. In quite a proportion of cases, however, the attacks fail to remit on conservative management, and surgical treatment is urgently required if a fatal outcome is to be avoided, though surgery itself undertaken in these circumstances has often carried considerable risks. There has been much controversy among physicians and surgeons about the frequency with which operative intervention is really needed in these acute conditions and regarding its optimal timing.

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Originally we were unwilling to resort to surgery in a severe acute attack of colitis—barring the development of an emergency situation such as perforation of the colon—till the patient had had a period of 10 days or so of intensive medical treatment, including administration of large doses of steroids, without evincing unequivocal signs of remission (Goligher, 1961). But an analysis in 1963 of our experience of treating patients with severe attacks of colitis according to this regimen showed a disturbingly high mortality and called into question the soundness of our plan of management of these cases (Watts *et al.*, 1966). It seemed to us that there might be advantages in an earlier resort to surgical treatment in these patients, say, within three or four days if no decided improvement in their condition was evident in that time on a conservative regimen. Accordingly since the beginning of 1964 we have adopted a policy of earlier surgical intervention. Three years ago we gave a preliminary report on the apparently favourable results of this practice (Goligher *et al.*, 1967). In the present paper we analyse our continued experience up to the end of 1969 in the treatment of severe attacks of ulcerative colitis.

Patients and Methods

From 1952 to 1969 inclusive 247 patients were admitted to the General Infirmary at Leeds with severe attacks of colitis. Occasionally the same patient was admitted twice during each period with separate attacks, so that the total number of attacks treated was 258—124 between 1952 and 1963, and 134 between 1964 and 1969. (Only one attack in each time period was counted for present purposes). The age distribution of the cases at the time of their attacks in the two periods, respectively, is shown in Table I and the extent of involvement of the large bowel in the two groups of cases is indicated in Table II. It will be seen that the composition of the two subséries is fairly similar in these respects.

Assessment of Severity.—In grading attacks of colitis as severe we adopted the criteria of Truelove and Witts (1955),

TABLE I.—Age of Patient at Time of Each Severe Attack of Colitis

| Age in Years | 1952-63 (124 attacks) | | 1964-9 (134 attacks) | |
|--------------|-----------------------|------------|----------------------|------------|
| | No. of Attacks | % of Total | No. of Attacks | % of Total |
| 0-19 | 34 | 27.4 | 21 | 15.7 |
| 20-39 | 44 | 35.5 | 55 | 41.1 |
| 40-59 | 28 | 22.6 | 38 | 28.3 |
| 60 and over | 18 | 14.5 | 20 | 14.9 |

TABLE II.—Extent of Involvement of Bowel by Colitis

| Extent of Disease | 1952-63 | | 1964-9 | |
|--|---------|------|--------|------|
| | Cases | % | Cases | % |
| Distal (rectum and possibly distal sigmoid) | 15 | 12.1 | 21 | 15.7 |
| Substantial (usually as far proximally as hepatic flexure) | 42 | 33.9 | 45 | 33.6 |
| Total (all colon involved) | 67 | 54.0 | 68 | 50.7 |

which are: *severe diarrhoea* (six or more motions a day); *macroscopic blood in the stools*; *fever* (mean evening temperature more than 99.5°F. (37.5°C.), or a temperature of 100°F. (37.8°C.) or more on at least two days out of four); *tachycardia* (mean pulse rate of more than 90 per minute); *anaemia* (haemoglobin 75% or less, allowance being made for recent transfusion); *E.S.R. much raised* (more than 30 mm. in one hour). It must be admitted that within these qualifications it is possible to have considerable variations in the severity of attacks, from fairly severe to absolutely overwhelming. Many of the attacks in our cases would have been labelled by some clinicians as "fulminating," but we have preferred to avoid this emotive, somewhat imprecise, term.

Initial Medical Management.—On admission to the General Infirmary, regardless of what treatment may have been given elsewhere, all patients were submitted in the first instance to an intensive course of conservative treatment. This included intravenous replacement of whole blood, plasma, and solutions of electrolytes, according to the needs of individual patients. In most cases large doses of systemic corticosteroids were given—50 mg. of cortisone by mouth six-hourly or 100 mg. of hydrocortisone six-hourly—and sometimes intramuscular injections of corticotrophin gel (up to 100 units daily). Most patients also received sulphasalazine (Salazopyrin) as well, in a dosage of 1 g. six-hourly. Under this regimen several outcomes were possible: (1) *remission*, with subsidence of bowel symptoms and constitutional disturbance; (2) *death during medical treatment*, (3) *continuation in modified forms of symptoms and constitutional effects*; and (4) *resort to surgical treatment with subsequent recovery or operative death*.

Indications for Surgical Intervention.—**Emergency operation**, carried out immediately or at latest within a few hours of the decision to resort to surgery having been reached, was indicated: (a) by the development of abdominal physical signs suggesting the occurrence of perforation of the bowel and peritonitis, particularly if associated with (b); (b) sudden deterioration in the general condition of the patient, which is usually a better guide to the occurrence of a perforation than are local physical signs (de Dombal *et al.*, 1965); (c) rarely by persistent massive haemorrhage from the bowel; and (d) during the latter years of the first period, 1952-63, and throughout the entire second period, 1964-9, by the development of acute dilatation of the colon. The indication for *urgent operation*, usually performed within the next 24 to 48 hours, differed somewhat before and after 31 December, 1963. During 1952-63 resort to urgent operation was usually delayed till it had been seen that there was no suggestion of remission after a full 10 days of intensive medical treatment. But during 1964-9 operation was considered to be urgently indicated in any patient over the age of 60 years if there was no definite clinical improvement after two to three days of conservative management, and in younger patients if there was no unequivocal signs that the attack was remitting after four to five days of intensive medical treatment.

Findings

During 1952-63 most patients coming to operation did so between 12 and 17 days of admission, while during 1964-9 operation usually took place within 5 to 8 days of admission.

Severe Attacks.—The overall outcome of severe attacks of colitis in the two periods studied, 1952-63 and 1964-9 respectively, is shown in Table III. It is to be noted that nearly as high a proportion of patients went into spontaneous remission in the second period as in the first. The pronounced fall in both medical and surgical death rates in the second period has had the effect of reducing the overall mortality from 11.3% during 1952-63 to 4.5% (or 3.8% if the unrelated medical death is discounted) during 1964-69.

Severe First Attacks.—In view of Edwards and Truelove's (1963) observation that the mortality of colitis is greatest during the first few months of the disease we have examined the outcome of severe first attacks (Table IV) in our series. During the 1952-63 period there was an overall mortality of 9.6% in 73 severe first attacks, but during 1964-69 none of the 33 cases suffering severe first attacks succumbed.

Severe Attacks in Elderly.—Our previous studies (Watts *et al.*, 1966) indicated that another group of patients particularly at risk during severe attacks of colitis is that of elderly subjects, and this is well shown in the part of Table V relating to the 1952-63 cases. There was an overall mortality of 50% in older patients during that period. During the 1964-9 period no less than half the patients underwent speedy spontaneous remission of their attacks, and of the other half, treated surgically, only two died, giving an overall mortality in the second period of only 10%.

Operations Performed.—The operation mainly favoured during both periods for the treatment of patients with severe

TABLE III.—Outcome of Severe Attacks of Colitis

| Outcome | 1952-63 (124 attacks) | | 1964-9 (134 attacks) | | |
|-----------------------------|-------------------------|------|----------------------|------|-----|
| | Cases | % | Cases | % | |
| Remission | 65* | 52.4 | 62 | 46.3 | |
| Resort to surgery | 40 | 32.3 | 72 | 53.0 | |
| Deaths { | Under medical treatment | 6 | 4.8 | 1† | 0.7 |
| | Operative | 8 | 20.0 | 5 | 7.0 |
| | Total | 14 | 11.3 | 6 | 4.5 |

*Excludes a further 13 patients (10.5%) who were not brought to surgery but continued for over 12 months with chronic bowel symptoms.
†Death was due to status asthmaticus and was unrelated to the colitis.

TABLE IV.—Outcome of Severe First Attacks

| Outcome | 1952-63 (73 attacks) | | 1964-9 (33 attacks) | | |
|-----------------------------|-------------------------|------|---------------------|------|---|
| | Cases | % | Cases | % | |
| Remission | 38* | 52.2 | 18 | 54.5 | |
| Resort to surgery | 20 | 27.4 | 15 | 45.5 | |
| Deaths { | Under medical treatment | 2 | 2.7 | 0 | — |
| | Operative | 5 | 6.9 | 0 | — |
| | Total | 7 | 9.6 | 0 | — |

*Excludes 8 patients who were not brought to surgery but continued for over 12 months with chronic bowel symptoms.

TABLE V.—Outcome of Severe Attacks in Patients Over 60 Years of Age

| Outcome | 1952-63 (16 attacks) | | 1964-9 (20 attacks) | | |
|-----------------------------|-------------------------|---------|---------------------|---------|------|
| | Cases | % | Cases | % | |
| Remission | 4 | 25.0 | 10 | 50.0 | |
| Resort to surgery | 9 | 56.2 | 10 | 50.0 | |
| Deaths { | Under medical treatment | 3 | 18.8 | 0 | 0.0 |
| | Operative | 5 | 31.2 | 2 | 10.0 |
| | Total | 8 (50%) | | 2 (10%) | |

TABLE VI.—Operative Methods Employed in 111 Severe Attacks of Colitis

| Method | 1952-63 | | 1964-9 | |
|--|---------|--------|--------|--------|
| | Cases | Deaths | Cases | Deaths |
| Ileostomy + complete proctocolectomy | 32 | 3 | 65 | 5 |
| Ileostomy + subtotal colectomy | 6 | 5 | 4 | — |
| Ileostomy + rectal excision | — | — | 1 | — |
| Laparotomy and closure | — | — | 1 | — |
| Other procedures | 2 | — | — | — |
| All methods | 40 | 8 | 71 | 5 |

TABLE VII.—Causes of Operative Deaths

| Causes | Cases |
|---------------------------------|-------|
| Septicaemia | 4 |
| Pulmonary embolism | 3 |
| Peritonitis | 3 |
| Primary haemorrhage | 1 |
| Cirrhosis and ascites | 1 |
| Cerebral haemorrhage | 1 |

attacks of colitis requiring surgery was a one-stage ileostomy and complete proctocolectomy (Table VI). Ileostomy and subtotal colectomy with preservation of a rectal stump was usually reserved either for specially ill patients, in whom the disadvantages of leaving the diseased rectum and distal sigmoid were deemed to be outweighed by the advantages of avoiding the additional strain of rectal excision, or for patients with relatively little rectal involvement, in whom a subsequent restoration of continuity seemed a possibility. The other operative methods listed were used in exceptional cases to meet particular requirements.

Causes of Death.—These are listed in Table VII. Sepsis in various forms was apparently the major lethal factor. Relative to our frequent use of complete proctocolectomy (Table VI) it is interesting to note that in only one patient, recorded as dying of primary haemorrhage, could it possibly have been claimed that the fatal outcome was perhaps attributable to the choice of this operation instead of the lesser procedure of ileostomy and subtotal colectomy.

Colonic Perforation and Dilatation.—In the 1952-63 period there were 13 cases of perforation of the colon (with a total of 20 perforations) in 124 severe attacks, or more strictly in 40 patients coming to urgent or emergency operation, for all cases diagnosed as having perforation were brought to laparotomy. Seven of these perforations communicated freely with the peritoneal cavity, 13 had sealed themselves off by the time of operation and were reopened during colectomy. In the 1964-9 period there were eight cases of perforation (with a total of 11 perforations) in 134 severe attacks or 71 laparotomies, three of the perforations being free and eight sealed. Of the total of 21 patients with perforation during 1952-69, six died, a mortality of 28.6%. A closely related complication, regarded by many as a preperforation condition, is that of acute colonic dilatation, which requires to be looked for by regular plain x-ray examinations of the abdomen. During 1952-63 acute dilatation of the colon was recognized in 14 patients. Of these, five had also perforation of the colon (three sealed, two free). All patients with this complication were submitted to emergency laparotomy and colectomy; four died postoperatively. In the 1964-9 period 14 patients developed acute dilatation; 13 accepted operation, and at laparotomy perforation of the colon was found in six (four sealed, two free); 1 of the 13 patients died. One patient who refused operation recovered on conservative management.

Patients Surviving on Conservative Management.—We have full follow-up information on all of the 140 patients who survived severe attacks on medical treatment alone during the entire period 1952-69. Forty-nine had further severe attacks, during which five patients died on conservative management and 17 required urgent operation, with one immediate death. Another 35 patients came to elective surgery with no deaths. Six patients treated conservatively had chronic continuous symptoms. It will be seen, therefore, that of the 140 patients who managed to escape urgent surgical treatment for the severe attacks for which they were admitted to the General Infirmary, 52 (37.1%) subsequently came to elective or urgent operation.

Patients Later Diagnosed as Crohn's Disease.—All 247 patients comprised in this study were considered at the time of their urgent admission to hospital to be suffering from ordinary diffuse ulcerative colitis. Later, however, pathological examination of operative specimens removed at the time of the severe attack that brought the patients to the General Infirmary, showed that in a number of cases the bowel lesion was really Crohn's colitis. This applied essentially to the group of patients treated during the 1964-9 period, when our pathologists were particularly on the alert for evidence of Crohn's disease. Of the 134 patients who had severe attacks in this time 98 came to immediate or later operation, and in 17 of these the operative specimens showed the features of Crohn's colitis.

Discussion

Value of Early Surgery

In our previous paper on the role of earlier surgery in the treatment of severe attacks of ulcerative colitis (*Goligher et al.*, 1967) we emphasized the importance, in assessing the possible benefits of this change of therapeutic regimen, of noting its effects not only on the operative mortality but also on the number of deaths occurring in the medically treated cases and on the overall mortality. We were able to show dramatic reductions in all these rates following the adoption of early surgical intervention in 1964, but we recognized that some of this improvement might have been entirely fortuitous and due to a change in the character of the cases presenting with severe colitis since that date. Doubts of this kind could, of course, be dispelled by a properly controlled prospective therapeutic trial, but the excellence of the results then being obtained with early surgery made us hesitant to embark on a trial, one effect of which would be to deprive half our patients of these apparent benefits. Accordingly, we have persisted with the selective use of early surgical intervention in cases of severe colitis that fail to respond rapidly to intensive medical therapy.

It will be seen from Table III that in the management of 134 severe attacks since 1964 only one patient died under medical treatment, but this was from a cause unrelated to the colitis (status asthmaticus). The medical mortality, therefore, could be reckoned as 0.7% or alternatively as nil, which contrasts with the 4.8% medical mortality in the management of 124 severe attacks during 1952-63. Of the 71 patients who came to urgent or emergency operation in 1964-9 five (7%) died—a considerable improvement on the 20% operative mortality during 1952-63. The overall mortality for the 134 severe attacks since 1964 was thus 4.5%—or 3.7% if the unrelated medical death is included—and this figure can be set against the 11.3% overall mortality for 124 severe attacks before 1964. Probably one of the factors partly responsible for the lower mortality in the second period has been the lesser incidence of colonic perforation in that time as compared with the previous period (11.1% as contrasted with 32.5% in operative cases), perhaps due to the shorter course on medical treatment before proceeding to operation.

Though the results with earlier surgical intervention now recorded have thus not proved quite as striking as those previously reported with this policy (*Goligher et al.*, 1967), they still seem to us to represent a gratifying improvement, bearing in mind the great severity of the illness in most of these patients.

Patients who Remit but later need Operation

An argument not infrequently levelled against early surgical intervention in acute phases of colitis is that it might result in quite a number of patients being subjected to an operation involving a permanent ileostomy, when, if conservative management had been continued for a little longer, a spontaneous remission might have been secured. As will be seen in Table III, however, the proportion of patients obtaining remission on medical treatment was almost as high (46.3%) during the 1964-9 period as it was in the 1952-63 period (52.4%), though admittedly another 10.5% of patients during the first period continued with chronic bowel symptoms for over 12 months. It would seem, therefore, that very few patients who were likely to secure a spontaneous remission of their attacks were in fact deprived of the opportunity to do so because surgery, when required, was performed earlier in 1964-9 (median five to eight days after admission) than in 1952-63 (median 12 to 17 days).

Furthermore, the follow-up on the 127 patients whose attacks remitted between 1952 and 1969 (plus the 13 patients who continued with chronic bowel symptoms) is somewhat disillusioning, for it shows that 49 of them had further severe

attacks, during which five died on medical treatment and 17 came to urgent or emergency operation, with one immediate death, while another 35 have to date undergone elective operation. There would thus seem to be at least a 37.1% chance that patients who have managed to avoid surgical intervention during a severe attack will eventually come to surgery.

Effects of Perforation and Acute Dilatation

The gravity of perforation as a complication of a severe attack of ulcerative colitis needs no emphasis (de Dombal *et al.*, 1965). At operation in cases so complicated the perforation may be revealed as a frank opening from the colon into the general peritoneal cavity leading to a diffuse faecal peritonitis, or alternatively it may be found that the part of the colon penetrated is firmly adherent to the anterior or lateral abdominal wall or an adjacent viscus, so that the hole in the bowel is in effect sealed off and there is no general peritoneal contamination. It is conceivable that some cases with sealed perforations may escape clinical recognition and recover under conservative management. We cannot entirely exclude this possibility in our series of cases, though we consider it most unlikely. All we can say is that every patient thought to have developed colonic perforation was advised to undergo immediate operation and that there were 21 such cases. At laparotomy these cases presented a total of 31 perforations, which were found to be free in 10 cases and sealed in 21. Treatment was by proctocolectomy or subtotal colectomy in all instances and six patients died, a mortality in perforation cases of 28.6%, which contrasts with a mortality of 11.6% for all 112 cases undergoing urgent or emergency operation in this series. Clearly with prompt radical surgical treatment patients with perforation of the colon in severe colitis can be given a fair chance of survival.

Another complication of severe colitis closely linked in most clinicians' minds with perforation of the colon is acute colonic dilatation, for in some cases this condition seems to precede the occurrence of perforation (Peskin and Davis, 1960; Sampson and Walker, 1961). Because of this relationship it is a common practice—to which we subscribe—to treat acute colonic dilatation in colitis by immediate resort to colectomy or proctocolectomy, in the hope of preventing the occurrence of perforation. All but one of our 28 patients with colonic dilatation had operation, 11 of them being found at

laparotomy to have associated perforations of the colon, mostly sealed. There were five operative deaths in this group of cases, a mortality of 18.5%. It should be added that the patient who refused operation for his colonic dilatation recovered on medical treatment. A point that emerges clearly from our experience is that acute colonic dilatation is not an invariable antecedent of perforation, for in 10 of our 21 cases of perforation there was no evidence of associated dilatation.

Relevance of Crohn's Disease

Crohn's disease has been increasingly encountered in the large bowel in recent years. Usually it presents certain characteristic features that enable it to be distinguished fairly reliably from ordinary ulcerative colitis. One of the features often mentioned is the chronicity of the condition, which, it has been claimed, renders it unlikely ever to produce a really severe acute colitis (Lockhart-Mummery and Morson, 1964). It may be of interest, therefore, to report that during the 1964-9 period, when pathologists were particularly on the lookout for Crohn's colitis 98 of the 134 cases underwent urgent or later operation and no fewer than 17 of the operative specimens showed clear evidence of Crohn's disease. It seems important, therefore, to recognize that Crohn's colitis can occur in a severe form masquerading as a severe attack of ordinary ulcerative colitis. It may even produce an acute colonic dilatation, as happened in one of our cases and as has been reported also by Javett and Brooke (1970), or perforation of the colon, as occurred in a recent patient of ours.

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