*Leading article***Aim of surgical treatment of Crohn's disease**

The study published in this issue¹ once again emphasises a topic which has dogged the management of Crohn's disease since the early days: radical vs non-radical surgery. The controversy began as a difference of opinion between those who advocated a resection for enteritis, or ileocaecal disease, and those who considered that the inflamed segments were better treated with a bypass operation. Eventually the weight of opinion favoured resection.²⁻³ Soon there arose a new disagreement concerning the amount of tissue which should be removed. On the one hand there were those who believed that an extensive excision cured the disease if carried out early enough; on the other were those who considered that less extensive surgery was safer because it was less likely to produce the short bowel syndrome and did not increase the chance of recurrence. This argument still continues although the balance has now tilted in favour of non-radical surgery.

After the classical papers of Lockhart-Mummery and Morson⁴⁻⁵ had settled the argument about the incidence of Crohn's colitis, the desirable extent of colonic resection was widely discussed. The debate took the form of proctocolectomy vs ileorectal anastomosis: it grew out of a feud over the choice of operation for ulcerative colitis. It was noted that patients with Crohn's disease had a significantly higher incidence of long term problems after proctocolectomy, mainly because of recurrent inflammation above the ileostomy. In 1973 Nugent and his colleagues⁶ set off a major rumpus when they reported that only one of 33 proctocolectomy patients followed for more than 11 years developed a recurrence. Subsequently in 1976 Veidenheimer *et al*⁷ compared the recurrence rate in patients with Crohn's colitis after proctocolectomy with the recurrence rate after total colectomy with ileorectal anastomosis. More than two thirds of the former, but less than 6% of the latter had recurrent disease. Most authors agreed that recurrence is more frequent after ileorectal anastomosis (reported as 32-75%), but there was less agreement concerning low incidence after proctocolectomy. There followed a spate of articles on the subject, often with contradictory findings.

There were many reasons for the different rates of recurrence after resection recorded by different units. Important factors in the early studies were the rarity of the disease, markedly variable anatomical distribution, the difficulty of clearly showing lesions in the small bowel with the old fashioned radiological techniques and, most importantly, the lack of adequate long term follow up. The rate of postoperative recurrence was reported by some to be virtually non-existent and by others to be more than 80%.⁸ The study from the Mayo Clinic by van Patter *et al*⁹ was the first report of a large series in which patients were followed for a considerable length of time. It recorded the findings on 600 patients seen at

the Clinic since 1912 and pointed out that 64% of 297 patients who had a resection developed a recurrence when followed for a minimum of two years postoperatively.

Since then a number of studies have clarified some of the early difficulties. In 1967 Lennard-Jones and Stalder¹⁰ made two important observations. They defined three types of recurrence: recurrence of symptoms alone; development of symptoms followed by radiological or histological evidence of new inflammation; and lastly development of new segments of disease which needed surgery. Their most important contribution was in the method of recording and analysing the follow up data. They advocated the calculation of recurrence rates using the actuarial method developed by Hill in 1966 for life tables.¹¹ This allows accurate estimation of the probability of recurrence during a given length of time. Since then it has been possible to compare the findings from different studies with some confidence. Some problems remain, however: although attempts have been made to define the terms used there is still no general agreement concerning recurrence, or relapse. This makes it difficult, or impossible, to compare the results of some reports advocating opposing methods of treatment.

Nearly all agree that the recurrence rate is higher after ileorectal anastomosis than after proctocolectomy, but it is certainly not as low as originally suggested by Nugent *et al.*⁶ Cumulative postoperative risks of 20% at five years and 35% at 10 years are reported in Hellers' exhaustive study from Stockholm;¹² these are less than the 30% and 50% expected after small bowel resections and after ileorectal anastomosis. The reason for the difference has yet to be found, but it should not be attributed simply to radical surgery, as the length of ileum removed is similar in both operations and recurrences usually develop at that site.

It can be seen that the debate about surgical treatment depends upon the aim of the surgeon. For those who thought that a cure was possible, the case for radical surgery seemed overwhelming; when the idea of surgical cure was abandoned, the aim of wide excision was the reduction of the recurrence rate. Ambrose *et al.*,¹ while reporting higher than usual incidence of recurrent disease, are much more interested in the postoperative health of the patients. Does this indicate a change in aim of surgery? Ambrose *et al.*¹ are not radicalists. It has been our practice to use the technique of faecal diversion with a split-ileostomy, rather than primary proctocolectomy, or ileorectal anastomosis, for similar cases of Crohn's colitis.¹³

Cure by excision would only be possible if the disease was localised to a removable segment of the gut. If this does occur, it is true only in the minority of cases. Evidence is gradually increasing that some sort of pathological process affects the whole intestine in patients with Crohn's disease.

It is the experience of most surgeons that during resections of diseased small intestine the limits of inflammation appear to be well defined at the beginning of the operation, but by the time the gut has been handled it begins to be oedematous and inflamed. A further shock may occur when the apparently normal intestine is opened and found to contain ulcerated mucosa. To ensure removal of the whole diseased segment and to be certain that sutures are not placed through active Crohn's disease we tried

using frozen sections of the cut ends before the anastomosis, as advocated by Kyle.¹⁴ Our histopathologists found, however, that accurate assessment of inflammation was not possible with this technique. Subsequently the ends of all resected specimens were carefully studied. In nearly half of the patients active Crohn's disease was found on histopathological examination, although great care had been taken to divide the bowel at least 5 cm above and below the lesion. Pennington *et al*¹⁵ published similar findings and categorised the abnormalities into four groups, the most severe with changes diagnosable as Crohn's inflammation. We too found non-specific changes such as minor fibrosis, oedema, or increased infiltration with inflammatory cells. Such non-specific changes were not classified by us as definite Crohn's disease, because they are often also found proximal to an obstruction. We classified as positive only those with a characteristic histological picture. At subsequent follow up the cumulative rates of recurrence in those who had had active inflammation in the cut ends at the time of resection, and those who did not, were similar. Heuman *et al*¹⁶ reported 67 patients undergoing 81 resections with anastomosis and followed for more than five years. The recurrence rate was independent of the presence of inflammation in the cut ends. They too concluded that resection should be restricted to macroscopically diseased bowel.

These findings complement the numerous reports suggesting that Crohn's disease is diffuse from the start. Unexpected abnormalities have been shown in routine rectal biopsies from patients with small bowel disease;¹⁷ biochemical abnormalities have been found in biopsies of apparently normal mucosa;^{18 19} random biopsies taken at various endoscopic examinations of patients with Crohn's disease have been unexpectedly found to show inflammation.²⁰ A careful histological study has shown active inflammation and even granulomata throughout apparently normal mucosa.²¹

The available data, far from producing a consensus, have once again polarised surgeons into different camps. In a paper entitled 'The importance of disease-free margins in resections for Crohn's disease', Wolff *et al*²² concluded that it had long been a fundamental principle of surgical therapy for Crohn's disease to remove all disease before carrying out an anastomosis. They added that, 'The authors recently noted with concern an article describing a series of patients demonstrating that residual involvement of anastomotic microscopic disease had no significant effect on the recurrence rate at the anastomosis'. They reported that 42 of their 710 patients had unexpected inflammation at the cut ends of the resected bowel, and that during an eight year follow up the recurrence rate of those with microscopic involvement was nearly 90%, compared with the expected 'institutional' recurrence rate of 55% at five years post-operatively. The authors concluded that clear margins of resection should be aimed at in Crohn's resections, if at all feasible. No other recent study has recorded such a high recurrence rate in any group of patients. It is difficult to compare these findings with those of Pennington *et al*¹⁵ and of Heuman *et al*,¹⁶ and the concept of relating the recurrence rate in a particular subgroup of patients to an institutional recurrence rate is particularly difficult to accept.

We felt that the recurrence rate depended on the natural history of the

disease rather than on the type of operation, or on the institution in which it was done, and that we had frequently and safely performed anastomoses through active Crohn's disease. We were therefore encouraged to operate on a group of patients with intestinal obstruction and malnutrition, in whom surgery had previously been thought to be contraindicated because the small bowel was universally affected. We undertook very limited operations which we described as minimal surgery.²³ The procedure used to overcome the obstruction depended on its length and the degree of active inflammation. In some sites we resected a short segment (1–2 cm); in others we made small side to side bypass entero-enterostomies, but most patients were treated by what we described as strictureplasties. The results have been excellent, with no postoperative complications and long term relief of the obstructions. The idea was later taken up by Alexander-Williams and Fornaro²⁴ and Hawker *et al*²⁵ in Birmingham, who have used it for extensive disease and in some cases for the type of lesion which we would treat by a standard non-radical excision, but they too have recorded good results with this technique. It seems important to stress two aspects of the procedure. Firstly, in all our cases, whatever local minimal operation was undertaken, the bowel had been sutured successfully through active macroscopic Crohn's disease. We have had no complications. To us this has been a corroboration of the previous observations where active microscopic inflammation was present in the cut ends of the resected bowel. It must therefore have been present at anastomoses which healed well. The second point (which is frequently overlooked) is that the aim of our operations was limited and well defined. Gone was the idea of surgical cure, or even an attempt to resect all macroscopic disease. The aim has been simply to correct a specific complication of Crohn's disease.

It is not suggested that all patients should be treated by minimal surgery. In the majority the symptoms and general health may best be helped by a standard resection. For small bowel, or ileocaecal disease the operations are well defined. For diffuse colitis it remains to be tested, perhaps by controlled study, whether proctocolectomy or ileorectal anastomosis offers the patient a better life style.

It is time for the old sterile arguments to be discarded. The evidence seems overwhelming that presently available surgical treatment does not cure the disease, however radical it may be. If a cure is possible by surgical excision, or if any method can be developed to reduce postoperative recurrence, it needs to be tested by randomised study.

An important point which has been virtually ignored, but which is fundamental to valid comparisons of treatment results, is the absence of an agreed morphological classification. Anyone who still believes that Crohn's colitis can be lumped together in one all-embracing group has never used a colonoscope. Careful radiological examination of the small intestine discloses further differences in the grouping of cases. Without a comprehensive classification it is virtually impossible to be certain that there is any comparability between patients and results reported by different units. In the study published in this issue¹ considerable attention is directed to the recording and analysis of the crude and cumulative recurrence rates, but there is no mention of the extent and severity of the colitis (other than in the rectum) and no record of the site and extent of the recurrence. An agreed morphological classification of the disease which

can be simply expressed and which incorporates a coding of the site, extent, and severity of the inflammation as well as a record of complications and operations is needed. One such classification has been devised and is being tested.²⁶

Because of the small number of cases and their great variability, surgical studies will need the concerted effort of a number of units in different countries. This will not be possible unless the aims of treatment and the definitions of such concepts as cure, recurrence, nutritional state, and disease activity have been agreed internationally. Perhaps then we shall begin to make a rational approach to the surgical treatment of a difficult but interesting disease. In the meanwhile it is my contention that we should have much more limited aims for surgical treatment. Used in this way, surgery should be seen as an incident in a lifetime of disease and should be kept to a minimum.

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