

Surgical Options for Acute Ulcerative Colitis

a report by

Baljit Singh¹ and Neil Mortensen²

1. Clinical Lecturer in Surgery; 2. Professor of Colorectal Surgery, Nuffield Department of Surgery, John Radcliffe Hospital, Oxford

There are a number of causes of colitis, the most frequent being inflammatory bowel disease, which comprises ulcerative colitis (UC) and Crohn's disease (CD). In the acute setting the management of colitis is often confined to that of UC, but other causes of acute colitis should not be overlooked, including bacterial, viral, parasitic, ischaemic and drug-induced.

The surgical management of acute colitis cannot be described in isolation, but goes hand in hand with the medical management of this condition. The acute presentation of bloody diarrhoea should initiate routine blood tests, stool culture, plain radiographs and a rigid sigmoidoscopy. The severity of an acute attack of UC can be determined by the Truelove and Witts classification.¹ Stool culture should be examined to exclude bacterial or parasitic causes. It is also important to test stool for *Clostridium difficile* toxin to exclude pseudomembranous colitis.

A sigmoidoscopy is useful as it will reveal rectal inflammation. Furthermore, a biopsy will be able to exclude cytomegalovirus (CMV) infection. This is important as successful medical management of CMV colitis obviates the need for surgery. The findings of a toxic megacolon or mucosal islands on an abdominal X-ray are indicative in three-quarters of patients of the potential failure of medical management and the likelihood of requiring surgery.² Travis et al. have described predictors for surgery,³ and they noted that a stool frequency greater than or equal to eight movements a day or a C-reactive protein greater than 45mg/l on day three during admission is associated with an 85% chance of requiring surgery.

The mainstay of medical treatment has been intravenous steroids. However, approximately 60% of patients have been reported to be resistant to this therapy. The alternative possibilities, which are referred to as second-line treatment, include the use of ciclosporin or a monoclonal antibody to tumour necrosis factor-alpha (infliximab). The former can be used as an intravenous or oral preparation. Additionally, ciclosporin does not increase the risk of peri-operative complications.⁴ However, while ciclosporin is effective in the treatment of acute severe UC, infliximab has been shown to be effective only for moderate UC.^{5,6} In addition, the longer half-life of infliximab compared with ciclosporin – days compared with hours, respectively – can potentially render a patient immunosuppressed following surgery. In theory, this can lead to increased post-operative morbidity, especially infective complications.

While a combined regime of ciclosporin and infliximab may seem attractive, the risk of profound immunosuppression is considerable. Therefore, infliximab would seem appropriate in the management of patients with moderate UC who would be predicted as having minimal

risk for surgery. The critical point to highlight is that the decision for surgery is not made unilaterally by the colorectal surgeon, but rather as a consensus between surgeon and gastroenterologist. Patients predicted to have a severe attack of colitis should have a colorectal surgeon involved from the onset. The decision for surgery should not be delayed, especially if there is a risk of perforation and bearing in mind the fact that early surgery ensures better results.

Indications for a colectomy include acute colitis and chronic disease, when the latter has failed medical therapy and malignancy. The former accounts for approximately 40% of cases.⁷ Absolute indications for surgery are perforation, massive bleeding and toxic megacolon.

Once a decision has been made to operate, it is important to involve the stomatherapist because stoma management is one of the major

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concerns following surgery. It also allows the opportunity to correctly site the stoma, especially as this is notoriously difficult once the patient is anaesthetised and supine. The patient is positioned in the modified Lloyd Davies position. Broad-spectrum antibiotics are routinely given as patients with acute colitis and on immunosuppression have an increased risk of wound infection. Mechanical bowel preparation is avoided due to the risk of perforation. Before surgery is started a rectal catheter is inserted to ensure that the rectum is decompressed, and also for irrigation of the rectal stump at the end of the surgical procedure. If one has not been placed pre-operatively, a urinary catheter is also inserted.

The surgical option of choice is a subtotal colectomy and ileostomy. The general principles of surgery are to remove the source of inflammation and avoid an anastomosis. These patients can be severely malnourished and the combination of high-dose steroids and immunosuppressants makes them susceptible to both infection and anastomotic leak.

The surgical approaches include either a classic mid-line laparotomy or a laparoscopic procedure; the latter technique is becoming more

Table 1: Major Factors Regarding Ulcerative Colitis

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| Exclude infective causes for colitis. |
| Grade severity of colitis using the Truelove and Witts criteria and identify patients with an increased likelihood for surgery. A stool frequency of >8/day or a C-reactive protein of >45mg/l on day three of admission is associated with a 85% risk of requiring surgery during the same admission. |
| First-line treatment is steroids. Second-line treatments include ciclosporin and infliximab. |
| Optimal management requires a colorectal surgeon and a gastroenterologist. |
| Surgical approach can be open or laparoscopic. |
| Options for rectal stump include a mucous fistula, closed subcutaneous rectal stump or an intraperitoneal rectal stump. |
| Rectum should be decompressed with a rectal catheter. |

prevalent.⁸ There have been several studies that have compared the two techniques. The advantage of laparoscopic surgery is the obvious cosmetic result. Furthermore, reduced tissue handling translates into a shorter time until the return of bowel function and, consequently, the restoration of a normal diet. In the long term, laparoscopic surgery should lead to a reduced incidence of adhesion formation.⁹ There have been a few studies that have compared the two techniques. Dunker et al. compared 32 patients who had an open colectomy with 10 who underwent laparoscopic surgery.¹⁰ In the latter technique the colon was removed via a pfannensteil incision; however, in both techniques the number of cases in which the rectum was decompressed by a Foley catheter or as a mucous fistula was not stated. Patients with UC accounted for 80% of the laparoscopic group but 56% of the open group. The length of operative time was longer in the laparoscopic group, but this was associated with a significantly shorter hospital stay (14.6 days in the laparoscopic group versus 18 days in the open group).

However, a criticism of this study is that the average length of hospital stay was significantly longer than is currently anticipated for open surgery. In part, this may be due to the data collected from 1996–1999. The recent trend for fast-track surgery has significantly reduced hospital stays even for open procedures, which can average five days. Although the incidence of complications was similar between the two groups, there was a higher incidence of re-laparotomy in the open group.

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Marcello et al. compared 19 patients who underwent laparoscopic colectomy with 29 patients having an open procedure.¹¹ The rectal stump was left attached to the subcutaneous tissue. This study reported that laparoscopic surgery was associated with a faster return of bowel function, which correlated with a shorter hospital stay. However, as with the study by Dunker et al., the operative time was significantly longer in the laparoscopic procedure.

Several institutions have also reported their retrospective experience with laparoscopic colectomy.^{12,13} One of the largest series to date is that of Marohn et al., where 65 patients underwent laparoscopic colectomy, of whom 85% had UC.¹⁴ In this study, the rectal stump was closed and left intraperitoneally. Length of hospital stay was a mean of 4.3 days with a complication rate of 12%. Compared with the previously described studies, the operative time was the longest with a mean of 444 minutes.

At the time of surgery, performing a subtotal colectomy and an end ileostomy removes the diseased colon. However, there are several options with regard to the management of the rectal stump. These include leaving a rectal stump either long and intraperitoneally or short and in the pelvis, a mucous fistula or leaving a closed rectal stump in the subcutaneous plane. Although leaving a minimal amount of diseased bowel, the former has the potential of leading to a perforated

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rectal stump, which can be life-threatening. In contrast, if a subcutaneous stump leaks, it leads to a wound discharge and formation of a mucous fistula, which can be easily dealt with. Furthermore, during subsequent surgery for formation of an ileo-anal pouch or completion proctectomy, a subcutaneous stump is easily located compared with an intraperitoneal one; however, some surgeons would dispute this statement. However, a mucous fistula effectively decompresses the rectal stump from the onset.

Studies published from St Mark's Hospital, Harrow have shown that pelvic dissection in the acute setting is associated with an increase in mortality, as highlighted by the mortality for proctocolectomy of 9% compared with less than 2% for a subtotal colectomy.¹⁵ The classic description of a subtotal colectomy involves formation of a left iliac fossa mucus fistula.¹⁶ However, a major disadvantage of this technique is that it creates a second stoma with the associated surgical and psychological problems involved in its management. Modifications of this procedure include siting of the mucous fistula in the lower part of the abdominal wound.

Albrechtsen et al. performed an emergency colectomy with ileostomy and mucous fistula in 120 patients with UC.¹⁷ The mucous fistula was placed at the lower end of the wound. A further 12 patients with acute UC underwent an ileo-rectal anastomosis or a proctocolectomy. The complication rate for the individual procedure is not stated, although the overall complications were wound sepsis/dehiscence of 24% and intra-abdominal abscess of 8%. While a mucous fistula is a safer option, it does entail a second stoma. Furthermore, an ileo-rectal anastomosis is fraught with danger – especially with anastomotic leakage – in the acute setting.¹⁸ A novel approach is to place the mucous fistula in the right iliac fossa, at the same site as the ileostomy.¹⁹

In 1985, Motson and Manche described a technique in which a closed rectal stump was left at the lower aspect of the abdominal wound because a closed subcutaneous rectal stump avoids a second stoma,²⁰ and we also routinely practise this approach in our institution. Ng et al. reported our experience with 32 patients who underwent a subtotal colectomy and closed subcutaneous rectal stump.²¹ Wound infection occurred in 6% and pelvic sepsis in 3%. The choice for closure of the rectal stump was either stapled or handsewn, or in some cases both methods were employed. However, there have been only a handful of studies that have compared the different techniques for the management of the rectal stump. Carter et al. compared a closed subcutaneous rectal stump with a mucous fistula and a short pelvic rectal stump.²² In this study, the closed subcutaneous rectal stump was placed in the left iliac fossa. The method of closure of the stump – stapled or handsewn – had no association with pelvic sepsis or wound infection. Pelvic sepsis occurred in 4% of patients with a closed subcutaneous rectal stump, in 7% of those with a mucous fistula and in 12% of those with a pelvic rectal stump, no differences being significant. Furthermore, patients were more symptomatic following a pelvic rectal stump compared with a mucous fistula or a closed subcutaneous rectal stump, with rectal bleeding occurring in 41% of the former compared with 27% in each of the latter cases.

Subsequently, all of these patients had an ileo-anal pouch, with dissection being the most difficult in patients who had a pelvic rectal stump. In two of the latter group the rectum was perforated. Following pouch formation, sexual dysfunction was only reported in the group with a pelvic rectal stump. The authors reasoned that with a short inflamed rectal stump there was a higher propensity for adhesion formation. However, pelvic sepsis can also occur even with a closed subcutaneous rectal stump. This may be related to an inadequate length of colon, which results in a stump that may have an impaired blood supply and also may be under tension.

Trickett et al. also compared their experience with a subcutaneous rectal stump versus an intraperitoneal stump.²³ Patients with a subcutaneous rectal stump had a significantly shorter hospital stay. These two techniques were associated with a pelvic sepsis rate of 0

and 7%, respectively. Furthermore, the incidence of wound infection was similar between the two groups.

However, a major determinant of pelvic sepsis is the length of the rectal stump. McKee et al. reported on a retrospective study comparing long and short rectal stumps.²⁴ Pelvic sepsis occurred in 1.9% of patients with a long stump compared with 33.3% in patients

The ideal management of the rectal stump is debatable, and the available options are a mucous fistula, a closed subcutaneous rectal stump or a closed intraperitoneal stump.

with a short rectal stump. Therefore, an alternative to a subcutaneous closed rectal stump is an intraperitoneal stump adequately decompressed by a Foley catheter. Indeed, Karch et al. reported no leakage from the closed rectal stump following routine insertion of a rectal catheter.²⁵ However, to date there have been no studies comparing the various surgical options for management of the rectal stump with routine use of a rectal catheter.

Summary and Conclusions

The management of acute colitis involves a combined approach with both colorectal surgeons and gastroenterologists. It is critical to identify from the onset patients who are unlikely to respond to medical treatment. Both open and laparoscopic approaches for a subtotal colectomy have been described. The ideal management of the rectal stump is debatable, and the available options are a mucous fistula, a closed subcutaneous rectal stump or a closed intraperitoneal stump. The latter is associated with an increased risk of pelvic sepsis. Drainage of the rectum with a rectal catheter seems to reduce the incidence of pelvic sepsis. ■

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