Surgical Management of Acute Colitis and Toxic Megacolon

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ABSTRACT

Toxic colitis, also known as fulminant colitis, or toxic megacolon when associated with bowel dilation, remains a significant emergent problem in patients with ulcerative colitis. The surgical options differ when compared with the patient undergoing elective resection for this disease and are influenced by the patients' overall medical status. Generally the options are total abdominal colectomy with ileostomy, and proctocolectomy with ileostomy or pouch reconstruction. In few circumstances, a decompressing colostomy and loop ileostomy may be performed. More recently, laparoscopy has been employed. The general surgical recommendations, indications, and techniques will be discussed.

KEYWORDS: Toxic colitis, fulminant colitis, toxic megacolon, surgery, surgical techniques

Objectives: Upon completion of this article, the reader should be able to summarize the surgical management of acute colitis and toxic megacolon.

The medical therapy of ulcerative colitis (UC) has improved significantly allowing many patients to defer or avoid surgery. Despite this, 40% of patients may still require urgent or emergent surgery because of complications of UC such as "toxic megacolon" or fulminant colitis, or more commonly, failure of medical therapy to control symptoms.¹ It is because of this that all gastrointestinal surgeons must be aware of the indications for surgery and the surgical options and recommendations available. The goals of surgery are control of the acute disease process, minimization of complications, maximization of quality of life, and maintaining the future possibility of restorative procedures such as the ileal pouch.

INDICATIONS

The indications for surgery are discussed in detail elsewhere, but a brief review of terminology and general indications is necessary for understanding the surgical options. Acute colitis refers to the patient presenting with signs and symptoms consistent with colitis, but generally not severe according to the Truelove classification.² See Table 1. Toxic or fulminant colitis refers to the patient with generalized signs of sepsis or toxicity such as hemodynamic compromise and fever consistent with the systemic inflammatory syndrome. In cases of colonic distention associated with fulminant colitis, the term "toxic megacolon" is used. This is theorized to be a result of involvement of the myenteric plexi and paralytic

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Table 1 Truelove Classification of Ulcerative Colitis Severity

Symptoms	Severe	Mild
Diarrhea	≥ 6/day	≤ 4/day
Blood in stool	Large amount	Small amount
Fever	≥ 99.50	None
Tachycardia	≥ 90 beats/min	None
Anemia	≤ 7.5% Hgb	None
ESR	≥ 30 mm/h	Normal

dilation of the bowel. Intestinal perforation is a life-threatening potential complication in such cases. The combination of colonic dilation and friable inflamed intestine makes this a significant concern.

The most common indication for urgent surgery in UC is failure of medical management during acute episodes of colitis. This may be manifested by ongoing pain, diarrhea, and bleeding without signs of the systemic inflammatory syndrome. Classically, colitis has been graded in severity clinically as shown in Table 1. Alves and associates advocate the use of endoscopic evaluation as a more accurate reflection of disease severity.³ Regardless of the method used to grade colitis, failure to show improvement in 48 to 72 hours or clinical deterioration warrants surgery. Fulminant colitis is the second most common indication for surgery in the patient with UC.⁴ Obviously, patients with emergent surgical indications such as perforation are taken to the operating room immediately.

SPECIAL CONSIDERATIONS

Patients requiring urgent and emergent surgery for colitis present many challenges to the surgeon. Systemic factors such as poor nutritional status with weight loss and hypoalbuminemia, pharmacologic immunosuppression, sepsis, and hemodynamic instability may affect the choice of surgery as well as increase the chance of adverse outcomes. Additionally, in some patients, the type of colitis may not be definitively known. In ~15% of patients with colitis, differentiation between Crohn's and UC is not possible and they are deemed to have indeterminate colitis. Even in patients undergoing ileal pouch-anal anastomosis (IPAA) for confirmed UC, the incidence of ultimately diagnosing Crohn's disease is 2.5 to 3.5%.^{5,6} The incidence of the diagnosis changing to Crohn's in the setting of urgent or emergent surgery has been reported at 28% in a recent series of 164 patients.³ The occurrence is likely higher in this group as it is the index presentation for many and pathology may be inaccurate in cases of fulminant colitis with full thickness involvement. For this reason and because of the generally poor overall medical status of these patients, the most expeditious, lowest-risk procedures are recommended.

As discussed next, definitive surgery and restorative proctocolectomy are usually performed after full recovery.

OPTIONS

Diverting ileostomy was originally the only surgical option for patients with fulminant colitis. The colon was not resected and hence, perforation and continued bleeding frequently occurred. The mortality for this procedure was as high as 70%.⁷ As a result, colectomy has been strongly recommended and the mortality has decreased to less than 10% in most series.^{3,8,9} In recent years many permutations of colectomy have been proposed and reported allowing more options for the surgeon caring for the patient with fulminant colitis.

Most commonly, a total abdominal colectomy with preservation of the rectum is performed. This results in clinical resolution of the colitis in almost all patients. Avoiding a proctectomy simplifies the operation and preserves the rectal planes making subsequent surgery and IPAA reconstruction more straightforward.¹⁰ When performing this first stage, it is recommended that the ileocolic vessel be preserved at its most distal extent to allow for adequate length for a subsequent small intestinal pouch. Although many surgeons performing pouch reconstruction routinely divide the ileocolic, the most conservative approach would be preservation. A Brooke end ileostomy is then performed.

The fate of the rectal stump has been of concern both because of the potential impact of leaving residual disease and the possibility of "stump blowout." Regarding the first issue, continued disease activity that cannot be controlled with topical agents is very unusual. Stump blowout refers to pelvic sepsis that may occur with the breakdown of the rectal remnant when left intraperitoneally, and this is a significant concern. The rectal stump is usually thickened and friable and may be comparable to the historical practice of leaving the colon in place with risk of perforation because of ongoing proctitis activity. The incidence of this is variable in the literature, but may be as high as 12%.¹¹⁻¹³ When it occurs, it is usually amenable to transrectal or transabdominal drainage. Whether this makes subsequent pelvic dissection more difficult in IPAA has not been clearly demonstrated.

There are other options available for management of the rectal remnant. If the stump is left intraperitoneally, many surgeons place a rectal catheter to allow for decompression. Alternatively, the rectal stump is left long enough (rectosigmoid) to allow creation of either a mucous fistula or placement of the closed rectal stump in the subcutaneous tissue. If a mucous fistula is created, topical therapy with irrigation of the remnant can be performed. When placed in the subcutaneous tissue, breakdown of the stump results in a soft-tissue infection rather than pelvic sepsis and drainage is simpler. Carter and colleagues found that pelvic dissection was

subjectively easier with these techniques than with intraperitoneal closure and there were fewer pelvic septic complications.¹³ In comparing patients with a long (35 cm) versus a short (25 cm) rectal stump, Ozuner and associates found no difference in short- or long-term complications or ability to perform an IPAA.¹¹ Regardless of closure technique, awareness of this as a potential complication postoperatively is important.

If restorative proctocolectomy is not a future option because of comorbidities, age, or personal preference, proctocolectomy with end ileostomy should be considered. This removes all disease and eliminates the possibility of cancer in the rectal stump which may occur in a small percentage of patients.¹⁴ It does have the disadvantage of being a more difficult surgery and should not be performed in the hemodynamically unstable patient.

Several centers caring for a high volume of patients with UC have reported their results with restorative proctocolectomy in the individual undergoing urgent or emergent surgery. In the series by Harms and group, IPAA was performed on 20 patients with fulminant colitis. Their average albumin was 2.1 and prednisone dose was 58 mg/day. The anastomotic leak rate was 5% and overall day and night continence was similar to patients undergoing elective surgery.¹⁵ Ziv and co-workers performed IPAA on patients with moderate fulminant colitis, excluding patients with hemodynamic changes and megacolon, with no significant pelvic septic complications.¹⁶

Creating a pouch in the patient presenting acutely has two major potential drawbacks. First, as described earlier, the diagnosis of UC may be incorrect, especially in cases of fulminant colitis. Second, there is evidence that performing an IPAA on a patient taking high-dose corticosteroids is associated with more complications. Specifically, pelvic sepsis and anastomotic leaks may be more frequent. This presents problems not only in the early postoperative period, but the incidence of poor pouch function and pouch failure may be higher in this population.¹⁷ Clearly this is an aggressive technique that should be considered only by the most experienced surgeons.

Very infrequently, a Turnbull-Blowhole colostomy is performed. This entails creating a colostomy for colonic decompression flush with the skin and a loop ileostomy. The primary indication is in the pregnant patient with fulminant colitis. In these patients, the risk of miscarriage if there is iatrogenic perforation, fecal spillage, rectal stump blowout, and pelvic sepsis is extremely high. In the critically ill patient or the pregnant patient without hemorrhagic colitis, the mortality of this technique was shown in one series of 83 patients to be 3.6%.¹⁸

As surgeons become more experienced in laparoscopic surgery, this technique is being utilized in the care of the patient with fulminant colitis. The potential

advantages are theoretically fewer adhesions and subsequent bowel obstructions, easier second-stage procedures, and decreased chance of wound complications in this population of immunosuppressed patients. There is a single series of 19 patients in which this was performed with no conversions, and an average operative time 244 in the last 8 patients. This resulted in a complication rate of 33%. Although the complications were not detailed, 17 of the 19 patients have undergone the second-stage procedure, implying they did not have long-term consequences.¹⁹ Clearly the laparoscopic approach should only be attempted by the very experienced laparoscopic surgeon as manipulation of the friable, inflamed mesentery and bowel has the potential for serious complications.

Wound closure has not been well studied in this population of patients. A large meta-analysis of incisional closure in laparotomy patients does suggest that continuous closure with a slowly absorbable suture may result in fewer complications.²⁰ The use of retention sutures has also not been thoroughly investigated. Some studies have found that they are not well tolerated because of pain and local skin complications and do not decrease the risk of hernia or dehiscence.^{21,22} Theoretically, retention sutures may decrease the risk of evisceration with dehiscence. Generally, it is recommended that the surgeon carefully perform the closure he or she is most familiar with.

OUTCOME

In addition to the common complications such as wound dehiscence, bleeding, and small bowel obstruction, there are a variety of less usual but serious potential complications. These include adrenal insufficiency, rectal stump blowout, and portal vein thrombosis.²³ Overall, though, the surgical outcomes continue to improve.

In a recent large series of 164 patients operated on at one center for acute colitis, the mortality rate was 0.6% with a morbidity of 33%. A policy of early intervention based largely on grading of colitis by endoscopic severity (Table 2) was adopted. Patients underwent a subtotal

Table 2 Endoscopic Classification of Ulcerative Colitis Severity

Moderate endoscopic colitis (MEC)
Erythematous, edematous mucosa
Deep ulcerations involving < 1/3 the circumference of a colonic segment
Severe endoscopic colitis (SEC)
Deep ulcerations
<ul style="list-style-type: none"> • Eroding the muscle layer • Involving > 1/3 the circumference of a colonic segment
Mucosal detachment on the edge of ulcerations in at least one colonic segment

colectomy, ileostomy, and sigmoidostomy, and postoperatively, the rectal stump was irrigated with steroids and mesalamine.³ This large series is consistent with other more recent reports of urgent and emergent surgery in the patient with acute colitis.³

CONCLUSION

With the continued advancements in medical therapy, surgical techniques, and postoperative care, operative outcomes are significantly better than 50 years ago in the patient requiring urgent and emergent surgery for fulminant colitis. Despite this, the morbidity remains significant and attention not only to intraoperative technique but also to postoperative care is critical. Although there are centers doing a large volume of cases in patients with UC, patients with fulminant colitis frequently present at hospitals not as experienced in their care. As stated previously, consideration of the individual patients' medical status and quality of life issues is important in choosing the most appropriate surgical procedure.

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