

# Subtotal Colectomy for Ulcerative Colitis: Complications Related to the Rectal Remnant

Frank M. Carter, M.D., Robin S. McLeod, M.D., Zane Cohen, M.D.

*From the Division of General Surgery, Toronto General Hospital and the Department of Surgery, University of Toronto, Toronto, Ontario, Canada*

Complications related to the retained rectal remnant were reviewed in 136 patients undergoing subtotal colectomy for acute ulcerative colitis. Fifty-five patients (Group 1) had a closed rectal stump brought up into the subcutaneous tissue, and 30 (Group 2) had an open mucous fistula. These were compared with an intrapelvic Hartmann's pouch performed in 51 patients (Group 3). All patients eventually had a pelvic pouch procedure. Age, duration and activity of disease, and preoperative steroid use were similar in all groups. There was no mortality. The rectal stump in 19 Group 1 patients (35 percent) spontaneously opened, and seven (13 percent) developed local left lower quadrant wound infections. Two Group 1 patients (4 percent) developed pelvic septic complications, as compared with two Group 2 patients (7 percent) and six Group 3 patients (12 percent). Subsequent pelvic dissection was difficult in 20 percent of Group 3 patients, *vs.* 4 percent and 0 percent of Group 1 and Group 2 patients, respectively ( $P < 0.05$ ). Persistent rectal disease activity was present in 41 percent of Group 3, *vs.* 27 percent of Groups 1 and 2. Our study suggests that exteriorization of the closed rectal stump following subtotal colectomy is associated with fewer pelvic septic complications and minimal local morbidity, facilitates subsequent pelvic dissection, and is not associated with increased disease activity in the retained rectum. [Key words: Ulcerative colitis; Colectomy/complications; Rectal diseases; Hartmann's procedure; Colon and rectal surgery]

Carter FM, McLeod RS, Cohen Z. Subtotal colectomy for ulcerative colitis: complications related to the rectal remnant. *Dis Colon Rectum* 1991;34:1005-1009.

Subtotal colectomy with ileostomy is the preferred surgical treatment for most patients with acute ulcerative colitis refractory to medical therapy. Technical options for dealing with the retained rectal stump are variable, however, and the choice is usually left to the discretion of the operating surgeon. Some patients may have persistence of the disease in the rectal remnant, but the majority regain their physical well-being and steroids

can be tapered. At a later date, completion proctectomy or, more recently, the creation of an ileoanal pouch as a means of restoring intestinal continuity is usually performed.

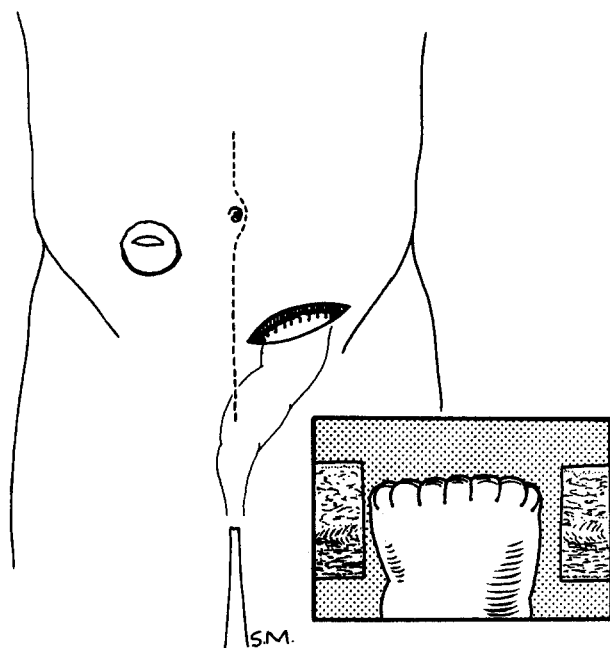
There are several ways of handling the rectal stump: oversewing of a conventional intrapelvic Hartmann's pouch, exteriorization of the rectum with oversewing, or creation of a mucous fistula. Our practice has been to transect the colon in the mid-to-distal sigmoid, oversew it, and exteriorize it in the extrafascial, subcutaneous tissues of the left lower quadrant with primary closure of the skin (Fig. 1). The possible advantages of this method are that it avoids a "blown rectal stump" and the associated intra-abdominal sepsis. In addition, it avoids a mucous fistula that often drains foul-smelling discharge, which is offensive to patients. Also, subsequent pelvic dissection of the Hartmann's pouch is often technically difficult compared with takedown of the exteriorized rectum.

To date, complications related to the rectal remnant after subtotal colectomy for ulcerative colitis have not been well documented in the literature. Thus, we undertook a retrospective review of our experience with these three options. Local and systemic morbidity related to the rectal remnant, along with the subsequent effect on the creation of a pelvic pouch, was evaluated.

## MATERIALS AND METHODS

The records of 136 patients who underwent a pelvic pouch procedure in three stages between March 1982 and August 1989 at the Toronto General Hospital were reviewed retrospectively. In all patients, the initial procedure performed was a subtotal colectomy with end-ileostomy. Fifty-five patients (Group 1) had a closed rectal stump brought up into the subcutaneous tissue, and 30 patients (Group 2) had an open mucous fistula

Dr. Carter was a Colon and Rectal Surgical Fellow supported by Ethicon Canada and the Wigston Foundation, Toronto, Canada. Address reprint requests to Dr. McLeod: Mount Sinai Hospital, 4th Floor, #451, 600 University Avenue, Toronto, Ontario M5G 1X5, Canada.



**Figure 1.** Diagram of exteriorized, closed, rectosigmoid remnant.

created. These were compared with a closed intrapelvic Hartmann's pouch performed in 51 patients (Group 3). All of the patients who had an exteriorization of a closed rectal stump (Group 1) had this procedure performed at the Toronto General Hospital. The remainder had the subtotal colectomy performed at other hospitals and were subsequently referred to our institution for completion proctectomy and creation of the pelvic pouch. The technical choice for handling the rectal stump at the time of the subtotal colectomy was determined by the preference of the operating surgeon.

In Groups 1 and 3, various methods of stump closure were used. The distal end of the bowel was stapled alone, oversewn with sutures alone, or both stapled and oversewn. In Group 1, the bowel was divided in the distal sigmoid to allow enough length and mobility to bring the closed end above the fascia. In Group 3, the level of division was somewhat variable; however, in most cases it was done at the level of the upper rectum, near the peritoneal reflection, or at the pelvic brim.

The age at initial operation, sex, preoperative duration of disease activity, and preoperative use of systemic steroids were recorded. Significant postoperative complications after subtotal colectomy were reviewed. Specifically, the incidence of pelvic sepsis in the form of abscess or peritonitis was compared among the three groups. In the

Group 1 patients, the rates of both local infection of the left lower quadrant wound and spontaneous opening of the stump resulting in a persistent mucous fistula were recorded. Local wound infections were defined either by the need to open and drain the left lower quadrant wound or by the occurrence of local cellulitis requiring the use of antibiotics. The occurrence of bothersome blood per rectum and the continued need for systemic steroid therapy as indicators of persistent disease activity in the rectal remnant were evaluated. Disease activity at the distal resection margin was assessed by pathologic evaluation of the colectomy specimen.

Finally, the effect of the presence of the rectal stump on the subsequent creation of an ileal pelvic pouch was considered. Difficulty of subsequent surgery was assessed by review of operative time and estimated blood loss during the pelvic pouch procedure as well as by review of operative dictations. The specific complications of urinary tract injury, sexual dysfunction, and leakage from the ileoanal anastomosis were also reviewed.

### Statistical Analysis

All data are expressed as means and standard deviations. Differences were tested using the *Z*-statistic.

### RESULTS

There were 55 patients who had exteriorization of a closed rectal remnant (Group 1), 30 with a mucous fistula (Group 2), and 51 with a standard intrapelvic Hartmann's pouch (Group 3). The characteristics of the groups are listed in Table 1. All three groups were similar in terms of age, sex, and disease duration, except that there were more

**Table 1.**  
Characteristics of Patients

	Group 1 (n = 55)	Group 2 (n = 30)	Group 3 (n = 51)
Mean age (yr)	30.5	31.6	29.2
Age range (yr)	15-50	13-52	16-50
Male/female (%/%)	56/44	60/40	76/24
Disease duration			
<2 yr (%)	44	40	49
2-5 yr (%)	20	27	24
>5 yr (%)	27	27	24
Unknown (%)	9	6	3
Preoperative steroid use (%)	98	100	98

males in Group 3. Only two patients were not on systemic steroids, reflecting the severity of the disease preoperatively in most patients. All patients had active inflammatory disease at the distal resection margin, as assessed by pathologic evaluation of the colectomy specimen.

There was no operative mortality. Pelvic sepsis in the form of either localized abscess formation or peritonitis occurred postoperatively in two of the Group 1 patients (4 percent) and two of the Group 2 patients (7 percent), compared with six of the Group 3 patients (12 percent) ( $P = NS$ ). In one of the Group 1 patients, sepsis was related to nonhealing and retraction of the exteriorized remnant below the fascia. In this case, a small contained leak was successfully treated with intravenous antibiotics alone. In the other patient, a spontaneous left lower quadrant abscess was controlled with percutaneous drainage. An enema with water-soluble contrast failed to demonstrate either leakage from or retraction of the rectal stump. Of the six patients in Group 3 who developed pelvic sepsis, one patient required urgent laparotomy for a blown rectal stump and generalized peritonitis occurring on the first postoperative day. The remaining five patients developed pelvic abscesses, which were treated successfully with either percutaneous or transrectal drainage along with intravenous antibiotic therapy.

Seven of the 55 Group 1 patients (13 percent) developed localized infections of the left lower quadrant wound, requiring either open drainage and packing or systemic antibiotics. In 19 patients (35 percent), the closed rectal remnant spontaneously opened, giving rise to a controlled mucous fistula. In none of the patients did these complications prohibit or delay the eventual creation of the pelvic pouch.

The persistence of bloody rectal drainage and the prolonged need for systemic steroid use after subtotal colectomy were felt to serve as markers of persistent disease activity in the rectal remnant. Bothersome bloody rectal drainage was more common in Group 3 patients (41 percent) than in Group 1 (27 percent) or Group 2 (27 percent) patients, even though the rectal stump was shorter in the former group. Table 2 lists these findings and also demonstrates that over 90 percent of patients in all three groups were able to be completely weaned from systemic steroids by the time of the pelvic pouch creation.

The method of stump closure in patients in Groups 1 and 3 is shown in Table 3. Of the six patients in Group 3 who developed pelvic sepsis, the rectal stump closure was stapled alone in two and was stapled and then oversewn in three, while, in the remaining patient, the method of closure was unknown. In both Group 1 patients who developed pelvic sepsis, the exteriorized remnant was handsewn closed in each case. Thus, the occurrence of complications such as stump leakage or abscess formation did not appear to be related to the method of closure.

The relationship between method of rectal remnant closure at the time of subtotal colectomy and the subsequent intraoperative and postoperative outcome of the pelvic pouch procedure is summarized in Tables 4 and 5. The pelvic dissection during the subsequent ileoanal pouch procedure was considered to be difficult in 10 Group 3 patients (20 percent) by the operating surgeon. This compared with 4 percent of Group 1 and 0 percent of Group 2 patients ( $P < 0.05$ ). In the Group 3 patients, inadvertent perforation of the rectum occurred in two patients, while the dissection was described as "considerably difficult" in the remaining eight. None of these patients was known to have had previous episodes of pelvic sepsis. The only two patients with sexual complications were Group 3 patients with closed, intrapelvic Hart-

**Table 2.**  
Measures of Disease Activity in the Rectal Remnant After Subtotal Colectomy

Group	Blood per Rectum		Systemic Steroid Use at Pelvic Pouch Creation	
	n	%	n	%
	1	15	27	4
2	8	27	2	7
3	21	41	1	2

**Table 3.**  
Method of Closure of the Rectal Remnant

Group	Stapled Alone		Handsewn Alone		Both		Unknown	
	n	%	n	%	n	%	n	%
	1	20	36	24	43	9	16	3
3	15	29	14	27	11	22	11	22

**Table 4.**  
Complications After Pelvic Pouch Creation

Group	Difficult Pelvic Dissection (%)	Urinary (%)	Sexual (%)	Anastomotic Leak (%)
1	4	0	0	9
2	0	0	0	7
3	20	0	4	8

**Table 5.**  
Pelvic Pouch Operative Time and Estimated Blood Loss (EBL)

Group	Operative Time (hr)		EBL (cc)	
	Mean	Range	Mean	Range
1	6.25	4-8	740	200-2,100
2	6.63	5-10	920	920-2,000
3	6.45	5-9	840	100-3,000

mann's pouches. One patient had a transection of his left vas deferens during a difficult pelvic dissection. The other patient suffered from retrograde ejaculation in the postoperative period. The rates of leakage from the ileoanal anastomosis were similar in all three groups, as were pelvic pouch operative time and estimated blood loss.

## DISCUSSION

In the emergency setting of acute ulcerative colitis, most surgeons would advise a subtotal colectomy and ileostomy in patients who have failed standard medical therapy or who are suspected of having septic or toxic complications of the disease.<sup>1-3</sup> In most cases, the rectal remnant is brought up as a mature mucous fistula either through the lower end of the midline incision or through a separate fascial opening in the left lower quadrant. Our practice at the Toronto General Hospital has been to exteriorize a closed rectal remnant in the extr fascial, subcutaneous tissues of the left lower quadrant, as depicted in Figure 1. This is similar to the technique described by Motson,<sup>4</sup> although the midline wound is not used. Other surgeons have divided the distal bowel at the level of the rectum and left a standard, closed, intrapelvic Hartmann's pouch.

Surprisingly, complications related to the rectal remnant in patients with acute ulcerative colitis have not been documented in the surgical literature. Fowler *et al.*<sup>5</sup> reported a case of perforated diverticulitis in the Hartmann's pouch originally performed for diverticular disease. In addition,

Oakley *et al.*<sup>6</sup> from the Cleveland Clinic reported on the eventual fate of the rectal stump after subtotal colectomy for ulcerative colitis. The issue of specific surgical complications involving the remnant was not addressed. Our purpose has been to evaluate, albeit in a retrospective fashion, the nature and frequency of complications related to the rectal remnant according to the method of closure after subtotal colectomy and ileostomy for ulcerative colitis.

At the time of colectomy, the bowel is acutely inflamed and the distal resection margin is often quite friable. The risk of stump blow-out may be considerable, accounting for the trend of most surgeons to exteriorize the rectal remnant. This was confirmed in our series, where pelvic septic complications occurred in 12 percent of patients in whom a Hartmann's pouch was constructed. One patient developed generalized peritonitis requiring laparotomy. A second disadvantage of the intrapelvic Hartmann's pouch is the increased difficulty in pelvic dissection and the associated risk of pelvic nerve injury. Again, this series confirmed these suspicions by demonstrating a higher rate of surgical dissection difficulties and sexual complications after subsequent pelvic pouch creation.

With the long rectal remnant, the posterior pelvic plane is more easily entered, whereas there is a tendency for the intrapelvic Hartmann's pouch to become adherent to the sacrum, making subsequent rectal dissection more difficult. In addition, there is a tendency for the adjacent small bowel to adhere to the rectal remnant, making the initial identification and exposure of the rectum tedious. Finally, the shortened remnant is more difficult to grasp and manipulate during the remainder of the low rectal dissection, which is necessary at the time of the pelvic pouch procedure. An exteriorized rectal remnant not only reduces the amount of pelvic adhesions, but also facilitates subsequent rectal dissection by providing a longer "handle" with which to manipulate the rectum.

The argument against leaving a longer rectal stump has been the theoretical risk of persistent disease activity owing to a longer segment of bowel remaining. This review showed results to the contrary. We have chosen to use persistence of bloody rectal drainage and the continued need for systemic steroid use as markers of persistent disease activity in the remaining rectal stump. Surprisingly, the shorter rectal remnant was associated with a higher rate of bloody drainage, although nearly all

patients in each group were able to be weaned from steroids and medically stabilized prior to subsequent operation. Although the accuracy and reliability of these markers for persistent disease may be inexact, our review at least seems to demonstrate that there is no objective evidence for increased or continued morbidity when a slightly longer segment of diseased bowel is left behind.

While the exteriorized, closed rectal remnant appears to be safer than the intrapelvic Hartmann's pouch, it is still disturbing that two patients developed intra-abdominal sepsis. This should, at least theoretically, be avoidable in all patients. Several technical considerations need to be emphasized. It is important to ensure adequate length to allow exteriorization of the bowel by dividing the colon in the mid-sigmoid and preserving the inferior mesenteric artery and its branches. No dissection of the rectum below the peritoneal reflection is done unless absolutely necessary to gain length and mobility. The rectal remnant should be brought out through a fascial opening made in the left lower quadrant rather than through the midline incision, and the opening should be large enough to avoid tearing the friable rectal wall during the exteriorization. In most cases, the left lower quadrant skin incision may be closed primarily. However, the incidence of local wound infection can be decreased by leaving the skin open and packing the wound.

From our results, one might argue that the creation of a mucous fistula is preferred since it is associated with the lowest incidence of both local and pelvic complications. However, many patients have more trouble, both physically and psychologically, in dealing with their mucous fistula than they have in dealing with the ileostomy itself. The amount of drainage from the mucous fistula can be of significant volume. In addition, depending on the severity of rectal disease, it may be bloody and malodorous. Although it is true that these complaints are usually temporary in that a definitive surgical resection for restoration of intestinal continuity is performed later, they still should not be totally discounted.

The success of our practice of exteriorizing a closed, elongated Hartmann's pouch in the subcutaneous tissues is generally supported by these findings. Although 13 percent of the patients developed a local wound infection in the left lower quadrant, the vast majority of these were treated by simply opening the wound and packing it with

gauze. While it is true that over a third of these patients had breakdown of the stump closure with development of a chronic mucous fistula, looked at another way, two-thirds of the patients healed the wound without incident and were spared the local problems and additional care needed in managing a mucous fistula.

## CONCLUSIONS

In conclusion, this review suggests that the creation of an intrapelvic Hartmann's pouch in patients with acute ulcerative colitis is associated with a high rate of pelvic sepsis as well as subsequent development of pelvic adhesions. Exteriorization of the rectal remnant above the level of the fascia, either as a mature mucous fistula or as a closed rectal remnant, is the preferred method of management. These techniques significantly reduce the risks of pelvic sepsis at the time of subtotal colectomy. In addition, exteriorization of the rectum may simplify subsequent pelvic dissection. Closure of the rectum rather than maturation of the rectum as a mucous fistula offers the advantage of eliminating a draining mucous fistula in the majority of patients with minimal associated morbidity. Finally, an elongated rectal remnant left *in situ* does not predispose the patient to the persistence of increased inflammatory disease activity in the retained rectum and still allows stabilization and improvement of the medical condition in anticipation of the eventual creation of a pelvic ileoanal pouch for the restoration of intestinal continuity.

## REFERENCES

1. Hawley PR. Emergency surgery for ulcerative colitis. *World J Surg* 1988;12:169-73.
2. Johnson WR, Hughes ES, McDermott FT, *et al.* The outcome of patients with ulcerative colitis managed by subtotal colectomy. *Surg Gynecol Obstet* 1986; 162:421-5.
3. Morgan B, Glenn D, Vickers C. Colectomy and ileostomy in the management of ulcerative colitis. *Can J Surg* 1987;30:354-5.
4. Motson RW. Modified Hartmann procedure for acute ulcerative colitis. *Surg Gynecol Obstet* 1985;160: 462-3.
5. Fowler C, Aaland M, Johnson L, Sternquist J. Perforated diverticulitis in a Hartmann rectal pouch. *Dis Colon Rectum* 1986;29:662-4.
6. Oakley JR, Lavery IC, Fazio VW, *et al.* The fate of the rectal stump after subtotal colectomy for ulcerative colitis. *Dis Colon Rectum* 1985;28:394-6.