

Fate of the Rectal Stump After Subtotal Colectomy for Ulcerative Colitis in the Era of Ileal Pouch–Anal Anastomosis

Semeret Munie, MD; Neil Hyman, MD; Turner Osler, MD

Importance: Total proctocolectomy with ileal pouch–anal anastomosis is considered the procedure of choice for patients requiring elective surgery for ulcerative colitis, but some patients undergoing subtotal colectomy with end ileostomy are satisfied with an ileostomy and do not choose to undergo later pelvic pouch surgery. The need and timing for completion proctectomy in this setting are uncertain.

Objective: To assess the long-term fate of the retained rectum compared with the morbidity associated with completion proctectomy in patients who underwent subtotal colectomy for ulcerative colitis.

Design and Setting: Retrospective review of a prospective database in an academic medical center.

Participants: Patients who underwent subtotal colectomy with ileostomy for ulcerative colitis from July 1, 1990, to December 31, 2010.

Main Outcomes and Measures: Proctectomy, surgical complications, and symptoms from the retained rectum.

Results: One hundred eight patients underwent subtotal colectomy for ulcerative colitis during the study pe-

riod: 73 for acute disease, 18 for advanced age and/or comorbidities, and 17 to avoid the risk of sexual dysfunction or infertility. Of these patients, 71 (65.7%) underwent subsequent ileal pouch–anal anastomosis, 2 died of other causes, and 3 were lost to follow-up. Of the remaining 32 patients, 20 chose rectal stump surveillance and 12 underwent elective proctectomy. Median follow-up was 13.8 years. No difference was noted in age, sex, surgical complications, pad use, or urinary dysfunction between the 2 groups. Only 8 of 20 patients in the surveillance group were compliant with follow-up endoscopy, and 13 were able to maintain their rectum; 2 required proctectomy at 11 and 16 years, respectively, for rectal cancer; neither has developed recurrent disease. One patient in each group reported erectile dysfunction.

Conclusions and Relevance: Management of the retained rectum after subtotal colectomy remains an important issue even in the era of ileal pouch–anal anastomosis. Considering the risk of rectal cancer, the low success rate of long-term rectal preservation, and the safety of surgery, a more aggressive approach to early completion proctectomy seems justified in this situation.

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APPROXIMATELY ONE-THIRD of patients with ulcerative colitis (UC) will require surgery within 13 years of initial diagnosis,¹ often in the setting of an acute disease exacerbation.² Despite advances in the medical treatment of UC, approximately 40% of patients with severe acute colitis continue to require urgent colectomy for fulminant colitis, toxic dilation, hemorrhage, or failure to respond to maximal medical therapy.³ Subtotal colectomy with ileostomy has significantly reduced treatment-related mortality and is typically the safest option for severe acute colitis.⁴⁻⁷

A subset of patients also undergoes subtotal colectomy (STC) electively because of uncertainty about the diagnosis (Crohn colitis vs UC), indecision about the choice of definitive procedure (pelvic pouch vs ileostomy), or to avoid the risk of infer-

tility associated with proctectomy. Many of these patients undergo completion proctectomy with ileal pouch–anal anastomosis (IPAA) at a later date. However, others are satisfied with their quality of life with an ileostomy and end up with a defunctionalized rectum.

See Invited Critique at end of article

Decision making for the long-term management of the retained rectum is multifactorial and requires the surgeon to weigh the medical comorbidities, extent of symptoms from the rectal stump, and the cancer risk against the morbidity of another major operation, including pelvic dissection. The objective of this study was to assess the long-term fate of the retained rectum compared with the mor-

Author Affiliations:
Department of Surgery,
University of Vermont College
of Medicine, Burlington,
Vermont.

Table 1. Indications for Elective Subtotal Colectomy

Variable	No.
Concerns about fertility	10
Uncertainty about ileostomy vs IPAA	8
Concerns about Crohn disease	7
Comorbidities	7
Concerns about erectile dysfunction	3

Abbreviation: IPAA, ileal pouch–anal anastomosis.

idity associated with completion proctectomy in patients who underwent STC for ulcerative colitis.

METHODS

Consecutive patients who underwent STC for histopathologically proven UC from July 1, 1990, to December 31, 2010, at Fletcher Allen Health Care, the teaching hospital of the University of Vermont College of Medicine, Burlington, were identified from a prospectively maintained complication database. Hospital records, operative and pathology reports, and follow-up outpatient clinic records were retrospectively reviewed. Recorded variables included sex, age at operation, use of preoperative intravenous corticosteroids or immunomodulatory agents, cigarette smoking, the method of rectal stump closure, and preoperative American Society of Anesthesiologists classification. Postoperative complications were recorded prospectively in real time by a specially trained nurse practitioner based on standardized definitions and confirmed at team complication conferences on a monthly basis.⁸ The need for transfusions for rectal bleeding, subsequent operative procedures (ie, proctectomy), and related pathology reports were reviewed.

Patients were typically seen at least annually by the surgeon (N.H.) and enterostomal therapist. The presence of rectal symptoms (pain, bleeding, and/or discharge) was assessed during follow-up clinic visits. Patients were also explicitly asked about urinary or sexual dysfunction. Men were asked about problems with their urinary stream and about erectile or ejaculatory difficulties. If they reported erectile dysfunction, it was rated as occasional, frequent, or always. Women were asked about urinary difficulties and problems with fertility but not dyspareunia. No validated tools were used to measure urinary or sexual dysfunction. Patients in the surveillance group were advised to undergo annual flexible sigmoidoscopy with biopsies to monitor for dysplasia.

All patients undergoing surgery for UC met with an enterostomal therapist preoperatively and were educated about both ileostomies and pelvic pouch surgery. The opportunity to meet with demographically similar patients who had undergone both procedures was provided, and both options were described as having advantages and disadvantages.⁹ In general, IPAA was offered 3 months after STC in patients once they were no longer receiving corticosteroids, anemia had resolved if present, their surgical wound was healed, and their sense of well-being had been restored to normal.

Cases of Crohn colitis or indeterminate colitis were excluded based on pathology reports. Patients who underwent completion proctectomy with IPAA at any time after STC were also excluded. We also chose to exclude patients who had their STC less than 5 years from comparative analysis to ensure adequate follow-up for the examined outcomes.

Analysis was by intent-to-treat. Specifically, patients were assigned to a treatment group at 5 years after STC. If they had not undergone completion proctectomy by that time, they remained in the surveillance group. Groups were compared using

Table 2. Patient Demographics

Variable	Surveillance ^a (n = 20)	Completion Proctectomy ^a (n = 12)
Sex		
Male	10 (58.8)	7 (41.2)
Female	10 (66.7)	5 (33.3)
Age, mean (range), y	47.1 (23-78)	41.9 (31-56)
Preoperative ASA classification, mean (range)	2.8 (0.6)	2.4 (0.8)
Extent of disease		
Only rectal	0	1 (8.3)
Left sided	2 (10)	3 (25)
Up to hepatic flexure	4 (20.0)	0
Pancolitis	14 (70.0)	8 (66.7)
History of smoking		
Yes	7 (35.0)	9 (75.0)
No	13 (65.0)	3 (25.0)

Abbreviation: ASA, American Society of Anesthesiologists.

^aValues are presented as number (percentage) unless otherwise indicated.

continuous variables using the *t* test or the Kruskal-Wallis test, as appropriate, and on categorical variables using the Fisher exact test. All statistical analysis was performed using STATA/MP (version 12.1; StataCorp LP).

RESULTS

One hundred eight patients underwent STC with ileostomy for UC during the study period. Of these patients, 73 had colectomy for severe acute disease refractory to medical therapy; 6 patients had free perforation. The other 35 patients underwent an elective STC; the primary reason for the choice to avoid or defer proctectomy is outlined in **Table 1**. Concern about infertility in women was the most common reason for rectal preservation in the setting of an elective procedure.

Of the patients, 71 of 108 (65.7%) underwent subsequent completion proctectomy with IPAA, all within 18 months of STC. Two patients died of unrelated causes during the study period, and 3 have not been followed-up for 5 years. Of the remaining 32 patients in the STC arm (those with a retained rectum), 20 chose stump surveillance and 12 underwent elective proctectomy at a median of 2.6 years after their initial colectomy.

The demographics of the patient population are listed in **Table 2**. Median follow-up was 13.8 years (range, 5.5-20.5 years). No statistically significant difference was noted between the groups for age, sex, or American Society of Anesthesiologists classification. Cigarette smoking had a borderline association with completion proctectomy as well as a limited distribution of disease. Only 4 (36%) of 11 smokers were found to have pancolitis on histopathologic evaluation of their surgical specimens compared with 18 (85.7%) of 21 nonsmokers (*P* = .006).

Of the 12 patients who underwent completion proctectomy, 3 had 1 or more postoperative complications within 30 days. One patient developed a wound infection, 1 had a urinary tract infection, and 1 patient required transperineal drainage of a pelvic abscess; this last patient also was readmitted with an early postoperative bowel obstruction

that resolved with nonoperative management. One patient in each group was found to have postoperative sexual dysfunction. One 58-year-old man who underwent completion proctectomy had worsening of his preoperative erectile dysfunction, with a change from occasional to frequent problems. A 62-year-old man in the surveillance group reported the new onset of “always” having erectile dysfunction 6 years after his STC. No patient in either group had urinary dysfunction. Two patients in each group wear a pad; 1 patient in the completion proctectomy group has a long-term superficial perineal wound sinus.

Only 8 of 20 surveillance patients were fully compliant with their annual sigmoidoscopies. Seven patients had fewer than 2 follow-up procedures. Two patients experienced rectal urgency, 2 had frequent tenesmus, and 7 had problematic rectal bleeding (requiring frequent treatment with topical 5-aminosalicylic acid and/or completion proctectomy). No patient required a blood transfusion. Two patients (10.0%) developed carcinoma of the rectal stump. One patient had node-positive rectal cancer 11 years after his initial colectomy; he had moved out of state and was undergoing annual surveillance at another institution. He noted an exacerbation of his bleeding with urgency and returned to our institution for the diagnostic endoscopy and subsequent proctectomy. A 44-year-old woman who had been noncompliant with surveillance developed new-onset bleeding and urgency 16 years after colectomy; she required proctectomy for stage II carcinoma. Both patients remain disease free at 8 and 3 years, respectively.

Five additional patients in the surveillance group underwent completion proctectomy at approximately 6, 7, 7, 9, and 11 years, respectively, after their initial STC. The indications were symptomatic proctitis in 3 and fear of cancer in 2 (1 at the time of concomitant hysterectomy for benign disease). As such, only 13 of 20 patients in the surveillance group still have their rectum in place.

DISCUSSION

Despite the widespread acceptance and popularity of IPAA in the surgical management of UC, management of the retained rectum after STC remains a fairly common and pertinent clinical problem. In our study, approximately two-thirds of patients did proceed to IPAA after STC, most often only several months later, but many other patients did not wish to undergo further elective operations to restore transanal defecation.

Although most of the cases were performed in the acute setting, 35 patients underwent STC electively. The most common indication was a concern about infertility. Ileal pouch-anal anastomosis has been associated with a procedure-specific infertility rate of 30% to 40%,¹⁰ and 10 women chose to have a preliminary STC to enable pregnancy. We found that if these women did not undergo IPAA by 18 months after STC, they uniformly chose to keep their ileostomy.

It has been surprisingly difficult to demonstrate an improvement in the global quality of life of patients who have had a pelvic pouch procedure compared with those who have had an ostomy.¹¹⁻¹⁵ The vast majority of benefit seems to come from colectomy and relief from the symptoms of poorly controlled UC.¹⁶ Although most pa-

tients with UC undergo IPAA, a significant group of patients do well with their stoma and end up with a retained rectum that must be removed or followed with endoscopic surveillance.

Another common reason for choosing an STC electively was uncertainty about whether to have an ileostomy or pelvic pouch after being educated about the surgical options. Subtotal colectomy allows the patient to “try on” an ileostomy without burning the bridge for a later pelvic pouch if so desired. Preliminary colectomy also allows for histopathologic evaluation of the colon prior to committing to an IPAA in patients for whom the distinction between UC and Crohn colitis remains uncertain despite careful clinical assessment. The considerable rate of change in diagnosis between UC and Crohn colitis after colectomy, especially in the short-term setting, has been highlighted by several investigators.^{5,17} Other patients have serious medical comorbidities and may be more safely managed with a more limited operation.

Based on our data, it seems difficult to justify holding off on proctectomy to avoid the risk of urinary or erectile dysfunction. There were no instances of urinary dysfunction, and only 1 patient described worsened problems with erection; this was not different in both the proctectomy and surveillance groups. Most of the patients in the completion proctectomy group were driven to this option within 5 years of colectomy by the annoying symptoms related to inflammation of the diverted rectum. In addition, 25.0% of our patients in the surveillance group also tired of their symptoms and had their rectum removed after the 5-year cutoff for group assignment.

Two late cancers in the surveillance group led to proctectomy. Particular concern about the risk of rectal cancer in this cohort is well founded; the increased risk of colorectal cancer in UC is well established, and between 24% and 38% of colitis-associated malignant carcinomas occur in the rectum.¹⁸⁻²¹ The risk of rectal cancer in the retained rectum has varied from 0% to 25%.²²⁻²⁹ However, even in the largest series with the longest follow-up, the absolute number of cancers is small and the confidence intervals necessarily large.³⁰ The 10% incidence of rectal cancer in our series is typical of the experience reported by others.^{18,20,21} In this context, the 40% compliance we observed with the advised annual surveillance sigmoidoscopy is particularly troubling.

Although the efficacy of surveillance strategies to identify dysplasia in UC can be criticized,³¹ endoscopic follow-up for patients with a retained rectum seems especially important.³⁰ Because the rectum is “out of circuit,” patients do not experience the change in stool caliber often reported by patients with cancer with their rectum in continuity. Furthermore, bleeding is a common symptom from the residual rectal mucosa in patients with UC. Although both of our patients with cancer did seek evaluation for an increase in bleeding and urgency, others may only recognize there is a problem if they develop pain or a fistula from extensive local invasion.

Most of the literature concerning the fate of the retained rectum dates back decades to the era when STC with ileorectal anastomosis was the sphincter-saving option for patients with UC.²³⁻²⁶ This operation has a limited role in the modern era of IPAA, and virtually all pa-

tients who undergo STC have an ileostomy instead with a defunctionalized rectum. As such, the applicability of these historic data to the present population of patients can be challenged on several grounds. Patients who had an ileorectal anastomosis did not have diversion of the fecal stream; symptomatic proctitis was much more limiting and could drive the decision to completion proctectomy or at least to seek follow-up evaluation.^{32,33} Conversely, patients with an ileostomy usually have limited symptoms from the retained rectum and are commonly not motivated to pursue follow-up as we observed.

We found that patients with a history of smoking were less likely to have pancolitis compared with nonsmokers. The association of smoking with lower rates of UC is well known.^{34,35} But we were surprised and interested by the apparent association smoking had with the decision to proceed with completion proctectomy. Whether this relates to the impact of smoking on disease distribution, personality attributes of smokers, the influence of smoking on comorbidities, or other factor(s) is unclear.

We are unaware of any modern series that provides similar data or long-term follow-up on this specialized group of patients. Limitations of this study include small sample size and the absence of validated instruments to measure urinary and sexual dysfunction. However, this case series began in 1990, and few if any such tools existed. The decision to assign patients to a treatment group at 5 years after STC was largely arbitrary. However, it does seem that many patients choose to enjoy the good health and quality-of-life improvement they experience after colectomy and are often in no hurry to return to the hospital for completion proctectomy.

In summary, we conclude that the management of the retained rectum continues to be an important problem, even in the era of IPAA. Some patients are satisfied just to be rid of their diseased colon and achieve a good quality of life with an ileostomy. In other circumstances, the potential morbidity associated with proctectomy can drive medical decision making. Considering the long-term risk of rectal carcinoma, the poor compliance with surveillance, and the reasonable safety of completion proctectomy, we would advocate a more aggressive approach toward rectal excision (with or without IPAA) either at the time of initial colectomy or at a later date in most circumstances.

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Correspondence: Neil Hyman, MD, Department of Surgery, University of Vermont College of Medicine, Fletcher 465, 111 Colchester Ave, Burlington, VT 05401 (Neil.Hyman@vtmednet.org).

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