Factors Predictive of Persistent or Recurrent Crohn's Disease in Excluded Rectal Segments

José G. Guillem, M.D., Patricia L. Roberts, M.D., John J. Murray, M.D., John A. Coller, M.D., Malcolm C. Veidenheimer, M.D., David J. Schoetz Jr., M.D.

From the Department of Colon and Rectal Surgery, Lahey Clinic Medical Center, Burlington, Massachusetts

The fate of the excluded rectal segment after surgery for Crohn's colitis remains poorly defined. To determine prognostic factors relating to the fate of the rectal segment, records of 47 patients who underwent creation of an excluded rectal segment were studied. Disease developed in 33 patients (70 percent) in the excluded rectal segment by five years; 24 patients (51 percent) had completion proctectomy by 2.4 years; and 9 patients (19 percent) retained a rectum with disease at a median follow-up period of five years (range, 2–13 years). At a median follow-up time of six years (range, 2–21 years), 14 patients were without clinical disease. The three groups were equivalent with respect to sex, duration of preoperative disease, indication for operation, distribution of disease, and histologic involvement of the proximal rectal margin. The median age of patients in the proctectomy group at diagnosis tended to be younger than that of patients with a retained excluded rectal segment (22, 30, and 31 years for patients having proctectomy, patients with a diseased excluded rectal segment, and patients with a normal excluded rectal segment, respectively). Neither initial involvement of the terminal ileum nor endoscopic inflammatory changes seen in the rectum predicted eventual disease of the excluded rectal segment. However, initial perianal disease complicating Crohn's colitis was predictive of persistent excluded rectal segment disease and often required proctectomy. Therefore, because the presence of perianal disease and Crohn's colitis predicts persistent or recurrent excluded rectal segment disease, primary total proctocolectomy or early completion proctectomy may be indicated in this subgroup of patients. [Key words: Crohn's disease; Excluded rectum; Anal Crohn's disease]

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Among the surgical options available for the treatment of patients with Crohn's colitis, colectomy with proximal fecal diversion and preservation of the rectum is often performed in patients who are too ill to tolerate a more definitive procedure, such as total proctocolectomy. Restoration of gastrointestinal continuity by an ileorectal anastomosis, although appealing, is fraught with a recurrence rate at least twice that seen in patients undergoing total proctocolectomy.[1] Retention of an excluded rectal segment (ERS) after colectomy for Crohn's colitis carries certain risks, including the development of diversion colitis,[2] persistence of perianal or perirectal disease,[3] and the rare development of rectal carcinoma.[4]

We reviewed the course of 47 patients with Crohn's colitis who had an ERS in an attempt to improve selection of patients for initial total proctocolectomy or early completion proctectomy of ERS. Numerous factors were analyzed to identify those predictive of persistent or recurrent Crohn's disease in the ERS.

MATERIALS AND METHODS

The clinical records of 47 patients who underwent creation of an ERS for Crohn's colitis at the Lahey Clinic during 1970 through 1989 were evaluated retrospectively. The diagnosis of Crohn's colitis was histologically confirmed in all patients. Patients whose specimen did not meet pathologic criteria or whose diagnosis was uncertain were excluded from study. Patients undergoing an ileorectal anastomosis were also excluded.

A series of clinical, endoscopic, and pathologic variables known at the time of creation of the ERS was identified. These variables included age and sex, indication for operation, duration and distribution of disease before creation of the ERS, the presence of an internal fistula, perianal disease, endoscopic rectal mucosal inflammation, findings of terminal ileal disease, and histologically confirmed Crohn's disease in the proximal rectal mar-

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Dr. Guillem's present address is Department of Colon and Rectal Surgery, Memorial Sloan-Kettering Cancer Center, New York, New York.

Address reprint requests to Dr. Schoetz: Department of Colon and Rectal Surgery, Lahey Clinic Medical Center, 41 Mall Road, Burlington, Massachusetts 01805.

gins. The fate of the rectum was correlated with these variables to determine whether any one variable or a combination thereof could be predictive of recurrent or persistent Crohn's disease in the retained rectum.

Statistical analysis was performed using chi-squared analysis and Miettinen's modification of Fisher's exact test, when indicated; probability values were two-tailed, with $P < 0.05$ regarded as statistically significant.

RESULTS

Patient Characteristics

A total of 26 men and 21 women with a median age of 33 (range, 11–81) years were studied. Median duration of disease before creation of the ERS was 6 (range, 0–26) years.

The operation that resulted in creation of an ERS varied; 30 patients underwent total abdominal colectomy and end-ileostomy, 11 patients underwent partial colectomy with fecal diversion, and 6 patients had simple fecal diversion (3 end-sigmoid colostomies, 1 transverse colon colostomy, 1 loop ileostomy, and 1 end-ileostomy). The excluded rectum was oversewn as a Hartmann's pouch in 35 patients and exteriorized on the anterior abdominal wall as a mucous fistula in the remaining 12 patients. At the time of the exclusion operation, 28 patients had perianal Crohn's disease.

The patients were categorized as a function of the status of the rectal segment into diseased and nondiseased ERS groups (Fig. 1). Of the 33 patients with a diseased rectum, 24 patients (73 percent) required completion proctectomy within three years. Crohn's disease was confirmed histologically in 20 of the 24 ERSs that were resected. In the other four patients, a nonspecific chronic inflammatory process was noted on histologic analysis; one process was thought to be consistent with diversion colitis.

Nine patients retained a clinically diseased ERS at a median follow-up time of three years (range, 2–13 years). All nine patients complained of mucous and bloody discharge two to six times per day. In all nine patients, the ERS was studied by endoscopy. Changes consistent with disease included strictures, nodularity, erosions, aphthous ulcers, friability, and fistula formation. In two patients, biopsies revealed histologic changes diagnostic of Crohn's disease.

In 14 patients, a clinically nondiseased ERS remains *in situ*. Although these patients were evaluated for an ileorectal anastomosis, none underwent this procedure because of medical reasons or because of the patient's reluctance to undergo further surgery. No patient had rectal discharge, pain, or formation of a fistula. In 6 of the 14 patients, records of endoscopic evaluation at follow-up examination were available. In all six patients, the rectal mucosa appeared normal.

Indications for Operation

The primary indications for operation that led to creation of an ERS were intractability in 23 patients, fistulous disease in 7, pelvic or perineal abscesses in 7, chronic perianal disease in 5, and toxic megacolon or colitis in 5 (Fig. 2). The indications for operation as well as the percentages of emergency operations performed (21 percent *vs.* 36 percent) were comparable for the diseased and nondiseased ERS groups. This finding suggests that the severity of the disease was comparable between groups at the time of the initial procedure. The severity of

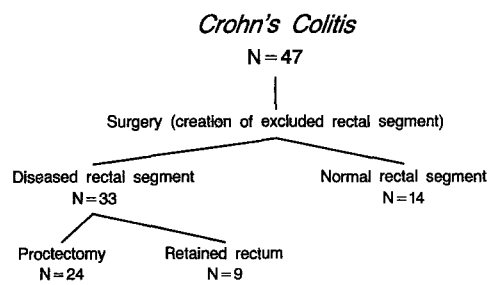

Figure 1. Categorization of rectal segments into those requiring completion proctectomy, those with a retained diseased rectal segment, and those with a retained normal rectal segment.

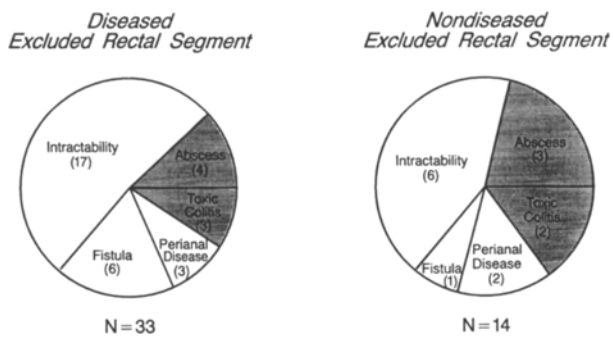

Figure 2. Primary indication for operation leading to creation of an ERS. Diseased and nondiseased groups define the status of the rectal segment at follow-up examination. Shaded areas represent emergent indications.

overall disease at the time of creation of the ERS does not appear to predict eventual disease in the ERS.

Age and Sex

The median age at the time of diagnosis of Crohn's disease for the three groups is shown in Table 1. Although the median age of patients in the proctectomy group at diagnosis tended to be lower than the age of patients with an ERS (22 *vs.* 30 years), age differences were not statistically significant. The ratios of male to female patients in the proctectomy group, diseased ERS group, and normal ERS group are also shown in Table 1. Although more men were in the diseased group (diseased ERS or proctectomy) than in the normal ERS group, the number was not statistically significant.

Duration of Disease

The median duration of disease before creation of the ERS was comparable among the three groups. These figures were six, eight, and five years for the proctectomy, diseased ERS, and normal ERS groups, respectively.

Table 1.
Clinical Characteristics

Characteristic	Proctectomy	Diseased ERS	Normal ERS
Number of patients	24	9	14
Male:female	14:10	7:2	5:9
Median age at creation of ERS (yr)	28	40	39
Median age at diagnosis of Crohn's disease (yr)	22	30	31

Pathologic Variables

As shown in Table 2, histologic evidence of Crohn's disease at the rectal margin, endoscopic rectal mucosal involvement, macroscopic terminal ileal disease, and the presence of an internal fistula at the time of creation of an ERS were not predictive of disease in the remaining rectum and did not alter the ultimate fate of the rectum. As noted, no statistical correlation occurred between the presence of these variables and the status of the rectum in the proctectomy, diseased ERS, or normal ERS groups.

Perianal Disease

Perianal disease included fissures, perianal or perirectal fistulas, and abscesses. At the time of the creation of the ERS, perianal disease was present in 28 patients. Of these patients, 15 underwent completion proctectomy, 9 have a diseased rectum *in situ*, and 4 patients have a normal rectum *in situ*. Of the 19 patients without perianal Crohn's disease at the time of creation of the ERS, 10 have a normal ERS *in situ*, and 9 underwent completion proctectomy. In seven of these patients, pathologic findings confirmed Crohn's disease in the resected ERS, while in two patients pathologic findings revealed nonspecific proctitis. In contrast to other variables, the presence of perianal disease, at the time of creation of the ERS, correlated strongly ($P = 0.003$) with eventual ERS disease because 24 of 28 patients (86 percent) with perianal disease eventually either required proctectomy (n = 15) or retained a diseased rectum *in situ* (n = 9). Of note, only 13 of these 28 patients had endoscopic evidence of rectal mucosal inflammation.

Table 2.
Correlation Between Fate of Rectum and Clinical Variables*

Variable	Perianal Disease	Involved Rectal Margins	Mucosal Involvement	Terminal Ileal Disease	Internal Fistula
Number of patients	28	20	26	25	11
Proctectomy	15	8	12	13	6
Diseased ERS	9	6	7	3	2
Normal ERS	4	6	7	9	3
P value	0.003	0.24	0.32	0.35	0.96

* Perianal disease includes fissures, fistulas, and abscesses. Rectal margins refer to the histologic presence of Crohn's disease at the proximal rectal margin. Mucosal involvement refers to endoscopic evidence of involvement of rectal mucosa (see text for details). Terminal ileal disease refers to macroscopic serosal evidence of Crohn's disease in the terminal ileum. Internal fistula refers to colocutaneous, colovesical, or enteroenteric fistula.

DISCUSSION

Although completion proctectomy for patients with severe persistent rectal or perianal disease is warranted, the management of the ERS in patients with less severe disease remains poorly defined. Decisions to proceed with completion proctectomy or re-establishment of intestinal continuity by means of an ileorectal anastomosis are based, in part, on the status of the retained rectum. However, because the risk for the development of carcinoma in the ERS probably increases with time, an increasing concern for removal of the ERS in patients with long-standing Crohn's colitis is evident. For these reasons, several authors[3, 5-7] have advocated early removal of a diseased rectum.

Attempts to rest the bowel and treat Crohn's colitis by fecal diversion with the hope of restoring intestinal continuity in the future have not been uniformly successful. Burman *et al.*[4] demonstrated that, although overall metabolic improvement occurred in 28 of 29 patients with Crohn's colitis who underwent fecal diversion, 15 patients (52 percent) eventually required excision of the defunctionalized bowel after about 37 months. These figures are similar to our finding of 51 percent at a mean of 26 months. In addition, they[4] noted that restoration of bowel continuity was successful in only 7 percent of their patients.

Similarly, Mortensen *et al.*[8] noted that subsequent rectal excision was necessary in 10 of 16 patients (63 percent) who underwent an emergency rectum-conserving operation for acute Crohn's colitis. The average time between colectomy and removal of the retained rectum was 25 months.

A frequent proctectomy rate for an ERS in patients with inflammatory bowel disease was reported by Mavroudis and Schrock.[5] Although their patients included 26 with ulcerative colitis, 17 with Crohn's colitis, and 9 with indeterminate colitis, 37 of the 52 patients (71 percent) with ERS required proctectomy after a mean of 2.5 years. They[5] noted that only 9 of the 58 patients were suitable candidates for ileoproctostomy, a number similar to that reported by Veidenheimer *et al.*[9] Because of the high proctectomy rate and poor results with ileoproctostomy, these authors[5] recommend proctectomy when the rectum is involved by inflammatory disease.

Stern *et al.*[6] also recommend removal of the rectal segment when obvious disease is present because five of eight of their patients with Crohn's colitis and an ERS required proctectomy. Lock *et al.*[10] reported on 101 patients with Crohn's colitis observed for an average of 12 years after subtotal colectomy and rectal exclusion. Proctectomy was eventually performed in 46 patients (46 percent). Goligher[11] reported on 57 patients with Crohn's colitis after subtotal colectomy and end-ileostomy. At follow-up examination, signs of Crohn's disease were evident in the retained rectum in 27 of the patients with ERS. Of these patients, nine (33 percent) eventually required completion proctectomy. Because of concerns about carcinoma, Goligher[7] stated that ". . . it would seem unwise to allow a grossly abnormal rectum to remain indefinitely."

Although arguments for the removal of the rectum are sound, uniform implementation of such a policy is difficult because patients in this predicament are often young. Concerns about autonomic nerve damage, body image, and social considerations of an ileostomy often greatly influence the patient's decision to forego proctectomy. Therefore, to reduce uncertainty and to define clear indications for removal of an ERS, several authors[11, 12] have attempted to identify factors that influence the success or failure of an ileorectal anastomosis in patients with Crohn's colitis. Farnell *et al.*[12] examined 80 patients with Crohn's colitis who had undergone colectomy with an ileorectal or ileosigmoid anastomosis. At a mean follow-up time of eight years, 23 patients (29 percent) had undergone proctectomy and 18 patients retained a diseased rectum. In their[12] series, age, level of anastomosis, or condition of the rectum did not appear to affect the proctectomy rate.

The results of our study corroborate the previously documented persistence of Crohn's disease in the ERS and the frequent need for proctectomy within three years of its creation.[4, 5, 8] In addition, our results begin to define specific factors predictive of recurrent or persistent Crohn's disease in the retained rectum. According to our data, perianal disease complicating Crohn's colitis at the time of creation of the ERS appears to predict eventual disease in the ERS that often requires proctectomy. Of interest, in the series of Goligher[11] on patients with Crohn's colitis, three of nine patients with an

ERS had anal fistula and profuse discharge as indications for proctectomy. Furthermore, Whelan *et al.*[13] noted a greater likelihood of recurrence and shorter interval to recurrence in patients with Crohn's disease who had an internal fistula or perianal disease as the indication for operation. They[13] did not address the recurrence of disease in the excluded rectum.

In our series, the presence of macroscopic terminal ileal disease at the time of creation of the ERS or histologic evidence of Crohn's disease at the proximal rectal margins did not predict early recurrence in the rectum. Steinberg *et al.*[14] were also unable to find a correlation between terminal ileal disease and recurrence. In the series reported by Lock *et al.*,[10] the presence of terminal ileal disease at the time of subtotal colectomy and diversion was predictive of a higher recurrence rate. However, they[10] did not comment on the effect of terminal ileal disease on the fate of the rectum.

Similarly, the presence of rectal mucosal inflammation at the time of the creation of the ERS did not appear to be a significant predictor of eventual disease progression. This result is similar to the findings of Goligher[11] and Farnell *et al.*[12] because the rectum was noted to be abnormal in most of the patients with an excluded rectum (>70 percent) although only one-third of patients eventually required completion proctectomy. The unique association between perianal disease complicating Crohn's colitis and eventual recurrent or persistent disease in the ERS suggests a more virulent form of the disease. Therefore, we suggest that initial proctocolectomy or early completion proctectomy be considered in patients with Crohn's colitis and perianal disease.

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