

Reoperative Rates for Crohn's Disease Following Strictureplasty

Long-Term Analysis

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BACKGROUND: In Crohn's disease, ten-year reoperative recurrence rates after resection range from 30 to 53 percent. To determine the effect of strictureplasty on reoperative "recurrence" rates, experience at a single tertiary care institution was reviewed. **PATIENTS AND MATERIALS:** Records of all patients who underwent strictureplasty for Crohn's disease from June 1984 to July 1994 at a tertiary care institution were reviewed. Data collected included duration of disease, medical and surgical history related to Crohn's disease, indications for strictureplasty, and long-term outcome. **RESULTS:** One hundred sixty-two patients (87 male) underwent 191 operations for a total of 698 strictureplasties (Heineke-Mikulicz, 617; Finney's, 81). Mean number of strictureplasties was three, and mean patient age was 36 years. No mortality occurred. Cumulative five-year incidence of reoperative recurrence was 28 percent (95 percent confidence interval, 18.8-37.2 percent), with a median follow-up of 42 (range, 1-120) months. Obstructive symptoms were relieved in 98 percent of patients. To determine whether any difference in reoperative rates exists between patients who have strictureplasty alone and those who have strictureplasty with bowel resection, we divided patients in two groups, those receiving strictureplasty alone and those undergoing strictureplasty plus resection. For patients treated by strictureplasty alone (Group A, n = 52; 32 percent), cumulative reoperative rate at five years was 31 ± 9.6 (\pm standard error) and for patients with concomitant bowel resection (Group B, n = 110; 68 percent), it was 27.2 ± 5.4 (\pm standard error). No statistical difference was present between these two groups. Of patients undergoing strictureplasty alone (Group A), operative recurrence was managed by new strictureplasty in seven, by strictureplasty in two, and by bowel resection in one. Among patients in Group B (strictureplasty and concomitant bowel resection), new strictureplasty was performed in 11, restrictureplasty in 6, and bowel resection in 9. **CONCLUSION:** Strictureplasty is a safe and effective procedure for Crohn's disease in selected patients. Reoperative rates are comparable with resective surgery, and most recurrences occur at new sites. [Key words: Strictureplasty; Crohn's disease; Recurrence; Follow-up]

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Crohn's disease is a chronic panintestinal disease with an unknown cause. Disease tends to progress despite surgical or medical management and cannot be cured. More than one-half of patients managed medically will eventually require surgical intervention. The goal of surgery is to correct complications of the disease or to relieve symptoms not controlled by medical therapy. Intestinal resection is the operation of choice for common presentation of Crohn's disease. Despite complete resection of gross disease, ten-year reoperative rates for recurrence range from 30 to 53 percent.^{1,2}

Strictureplasty was first advocated as an alternative to intestinal resection in small-bowel Crohn's disease by Lee and Papaionnou.³ Enthusiasm for performing strictureplasty has grown slowly, but during the past decade, it has become accepted as a convenient, safe, and effective technique for a select group of patients with Crohn's disease, particularly those with multiple points of obstruction and those vulnerable to short-bowel syndrome. As diseased bowel remains in patients undergoing strictureplasty, concern has been raised that recrudescence of symptomatic Crohn's that requires operative intervention might occur earlier after strictureplasty than after resection.⁴

To determine reoperative rates after strictureplasty, we analyzed patients who underwent reoperation because of recrudescence at the strictureplasty site rather than because of recrudescence of disease at other sites. Moreover, we further analyzed patient groups who had resective procedures in addition to a strictureplasty and compared the reoperative rates with that in patients who underwent strictureplasty alone.

PATIENTS AND METHODS

A retrospective analysis of all patients with Crohn's disease who underwent strictureplasty between June 1984 and July 1994 at a single tertiary care institution

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was performed. Duration of Crohn's disease-associated medical and surgical history, indications for strictureplasty, perioperative complications, and long-term outcome were analyzed.

All patients underwent various blood tests including complete blood count, electrolytes, liver function tests, and other pertinent laboratory investigations. Preoperatively, a small-bowel series, colonoscopy, and/or barium enema were performed on each patient as well.

A bowel preparation and prophylactic broad-spectrum antibiotics were used in the vast majority of patients. Strictureplasty was performed in a fashion analogous to a pyloroplasty. A Heineke-Mikulicz reconstruction was performed for short strictures of less than 10 cm, and a Finney's reconstruction was undertaken for longer strictures. At laparotomy, all sites of macroscopic Crohn's disease were inspected; strictures were identified by careful palpation of the bowel and, in our earlier experience, by pre-enterotomy pull-through with the 2-cm balloon of a Foley[®] catheter (Bard Urological Co., Covington, GA). This latter technique is infrequently used now. Decision to resect or perform a strictureplasty was made by the individual surgeon. Simple strictureplasty was reserved for patients who had not had a previous resection but in whom multiple skip lesions were present or for patients with short-bowel syndrome.

Follow-up was performed by personal or telephone interview, blood tests, and radiologic studies with or without endoscopic studies. Symptomatic relief after surgery was assessed subjectively by patients as being marked, minimal/unchanged, or worsened. Recurrence was defined as the need for reoperation for symptomatic recrudescence. Symptomatic recurrence that was medically treated was separately analyzed. To determine whether strictureplasty combined with bowel resection had an effect on

reoperative rate, patients were divided in two groups according to whether they had strictureplasty alone (Group A) or strictureplasty plus bowel resection (Group B).

Comparisons of proportions of events were made with chi-squared tests or Fisher's exact tests when necessary. Differences were considered significant if $P < 0.05$. Descriptive statistics were expressed as mean, median, and standard deviation for continuous measures and as frequency counts and percentages for discrete data. Time-to-event analysis using the Kaplan-Meier method was performed to estimate the cumulative incidence of reoperation during the course of follow-up. Confidence intervals (95 percent) were calculated at several time points to determine precision of the reoperation estimate. All statistical analyses were performed using the SAS system (SAS Institute, Cary, NC).⁵

RESULTS

One hundred sixty-two patients (87 males) underwent 191 operations for a total of 698 strictureplasties (Heineke-Mikulicz, 617; Finney's, 81). Patient characteristics for each group are shown in Table 1. Resections were performed for acute inflammatory phlegmon, overt perforation, fistula, long strictures (more than 30 cm), and presence of multiple strictures within a short segment. Median duration of Crohn's disease before undergoing strictureplasty was 13 (range, 0–41) years.

Median hospital stay was 8 (range, 2–57) days for all patients. No difference was noted between Groups A and B (median stay, 7 and 8 days, respectively). No operative mortality occurred. Septic complications (*i.e.*, fistula, abscess, leak) occurred in 5 percent of patients.

Median follow-up was 42 (range, 1–120) months.

Table 1.
Characteristics of 162 Patients Undergoing Reoperation for Recurring Crohn's Disease After Strictureplasty

Characteristics	All Patients	Group A—SXPL	Group B—SXPL Plus Resection
No.	162	52	110
Male/female	1:1.2	1:1.5	1:1
Median age, years	36	36	36
Range	(15–72)	(16–72)	(15–72)
Strictureplasties (n)	698	227	471
H-M (n)	617	196	421
F (n)	81	31	50

SXPL = strictureplasty; H-M = Heineke-Mikulicz; F = Finney.

Table 2.

Reoperative Site for Recurrent Crohn's Disease in 162 Patients Compared by Required Reoperative Procedure

Reoperative Site and Procedure	Total Patients n (%)	Strictureplasty n (%)	Structureplasty and Resection n (%)
New site			
Strictureplasty	18 (11)	7 (14)	11 (10)
Resection	10 (6)	1 (2)	9 (8)
Same site			
Strictureplasty	8 (5)	2 (4)	6 (6)
Total	36 (22)	10 (20)	26 (24)

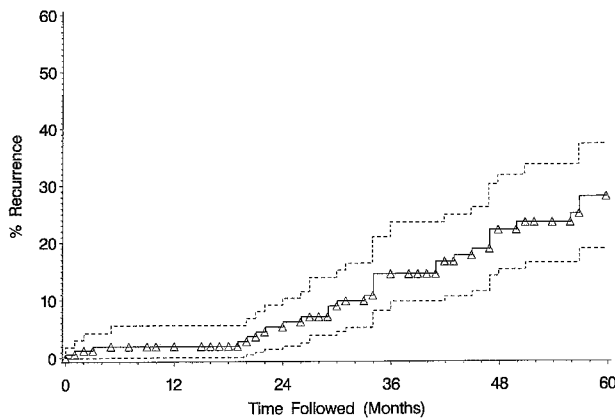


Figure 1. Cumulative surgical recurrence rates with 95 percent confidence intervals.

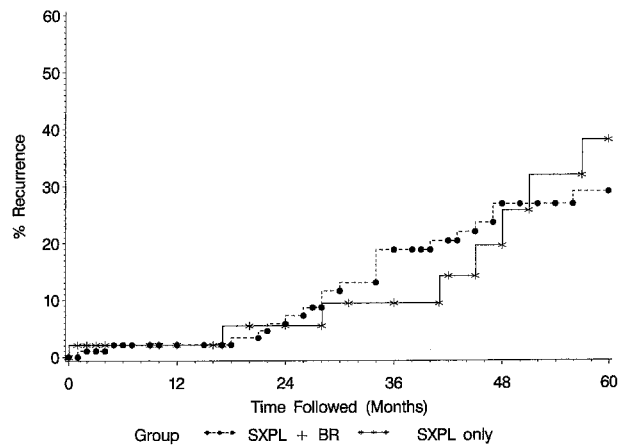


Figure 2. Cumulative surgical recurrence rates by concomitant surgery. SXPL = strictureplasty; BR = bowel resection.

Obstructive symptoms were relieved in 98 percent of all patients. Subjective relief of symptoms as assessed by the patient approximately six months after surgery was significant or marked in 136 patients, moderate in 23, and minimum or unchanged in 2 patients. One patient reported worsening of symptoms.

The number of patients with a recurrence requiring reoperation secondary to recrudescence at the strictureplasty site and at other sites for each group is shown in Table 2. Five patients who underwent resection at new disease sites had resection of a previous strictureplasty site as well. Symptomatic recrudescence solely managed by medical treatment was seen in 2 percent of patients in Group A and 8 percent of patients in Group B.

Percentage of patients requiring reoperation as a function of time was calculated by the Kaplan-Meier method. Crude five-year reoperative rate was 22 percent for all patients. For patients undergoing strictureplasty only, the rate was 20.4 percent; for patients with concomitant resection, it was 24.3 percent. Cumulative five-year surgical recurrence was 28 percent overall, 31 percent in Group A, and 27.2 percent in Group B patients (Figs. 1 and 2).

DISCUSSION

Efforts to identify Crohn's disease patients at high risk for recurrent disease requiring reoperation have been complicated by use of different criteria and definitions.^{1, 6-10} Many studies failed to differentiate between recrudescence of disease at original site of operation and recrudescence at sites distant from operation.^{1, 2, 6, 7, 11, 12} However, broadly defined, reoperative recurrence for Crohn's disease ranges from 30 to 53 percent at ten years.^{1, 2, 13}

The goal of strictureplasty for Crohn's disease is to correct obstructive strictures while preserving as much intestine as possible. This approach is based on the fact that Crohn's disease is potentially panintestinal, that once diagnosed the risk of relapse is ever present, and that recurrence of Crohn's disease has been shown to be independent of the presence of microscopic disease at intestinal resection margins.¹⁴ Furthermore, no adjuvant medical treatment has been able to conclusively decrease the incidence of recurrence after surgery.

During strictureplasty, the diseased intestine re-

mains unresected, and the anastomosis is made through macroscopically affected bowel. Thus, critics have feared that a high rate of complications and early relapse will occur. However, safety and efficacy of stricturoplasty has been demonstrated in several reports during the past decade.^{4, 15, 16}

In this study, we analyzed operative-free intervals after stricturoplasty for small-bowel Crohn's disease. Patients with concomitant resection were separately analyzed to better understand the influence of simple stricturoplasty on reoperative rates. Also, reoperation secondary to recrudescence at previous stricturoplasty sites *vs.* at other sites was separately defined. No statistically significant difference could be demonstrated in operative-free intervals between groups.

Reoperation was most often performed for recrudescence of disease at other sites distant from the previous stricturoplasty. At reoperation, each previous stricturoplasty is carefully examined. To facilitate identification of these sites, a metallic clip is placed on the mesenteric side at the time of initial stricturoplasty.¹⁷ In most instances, the clip covered by a film of peritoneum was the only evidence for a previous stricturoplasty.

Complication rates after stricturoplasty were low, and no mortality occurred. Multiple stricturoplasties were not associated with increased septic complications.

Reoperative rates after stricturoplasty were lower than in several reported series.^{1, 13, 17-19} No statistically significant surgery-free interval was noted based on location of disease in patients undergoing stricturoplasty. Even though results of our study suggest recurrence after stricturoplasty may be equivalent to published data on recurrence after resection, one should consider extirpation of grossly diseased bowel whenever certain conditions are met.

The following conditions are considered a contra-indication to stricturoplasty: peri-intestinal sepsis or abscess; presence of enteroenteric or enterocutaneous fistulas; multiple strictures in a short segment of intestine; multiple strictured areas in a close proximity to planned resection sites; hemorrhagic pattern of disease; hypoalbuminemia (less than 2 g/dl). We did not find any peaks in reoperative rates after stricturoplasty or stricturoplasty in combination with resection. Some studies have demonstrated bipolar cumulative curves of recurrence after resection (early and late reoperations).⁴ This pattern may represent a more aggressive form of disease. However, identification of such peaks in the hazard rate with separate forms of

disease must remain speculative at best until further data become available.

CONCLUSION

Stricturoplasty is a safe and effective procedure for Crohn's disease in selected patients. Complications are few, reoperative rates are comparable with those in resective surgery, and most recurrences occur at new sites.

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