

Original article

## Results of Surgical Treatment of Crohn's Disease

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### SUMMARY

**Purpose:** The aim of this study was to elucidate the features, indications, and surgical treatment in patients affected by complications of Crohn's disease.

**Materials and methods:** Between January 1986 and August 2002, 72 consecutive patients, (47 male, 25 female; mean age 37 years), were operated on for 86 occurrences of Crohn's disease. Data were collected retrospectively.

**Results:** Indications for surgery included: failure of medical management (n=32), obstruction (n=23), intestinal fistula (n=11), mass (n=7), abdominal abscess (n=5), peritonitis (n=1), development of cancer (n=1) and perianal sepsis (n=4). Perioperative complications occurred in 24 out of 82 abdominal operations (29,2%), and resulted in one death.

**Conclusions:** Patterns of surgical treatment of Crohn's disease are changing, and more emphasis now being given in more conservative operations. The presence of extensive disease with fistulisation significantly increases the number of perioperative complications and the probability of postoperative recurrences.

**Key words:** Crohn's disease, Inflammatory bowel disease, Complications, Obstruction, Fistulas, Colitis, Ileitis, Strictureplasty, Resection

### INTRODUCTION

Crohn's disease is a chronic inflammatory condition that can affect any segment of the gastrointestinal tract

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from the oral cavity to the anus. The disease often manifests with varied symptoms and numerous potential complications that include intestinal strictures, enteric fistulas, intraabdominal abscesses, and gastrointestinal hemorrhage. Patients with Crohn's disease are a heterogeneous group and, consequently, the individual course of the disease is difficult to predict. Some have a rather mild form, but others suffer frequent flare-ups requiring resection, with symptoms recurring soon after surgery.<sup>1</sup>

Because of the varied patterns of disease and the differing complications, the surgeon must use an array of surgical strategies to deal with this difficult disease, with the aim of preserving as much bowel function as possible by adopting a more conservative surgical approach.

We conducted a retrospective analysis of our experience with the surgical management of such patients over the past 15 years in order to gain insight into the spectrum of the disease and the current surgical strategies used.

### MATERIAL AND METHODS

Records of 72 consecutive patients with Crohn's disease, (47 male, 25 female, with a mean age of 37 years), referred to our department for surgical treatment were studied retrospectively.

The diagnosis was established according to the criteria proposed by Lennard-Jones, including clinical history, radiological and endoscopic examination, macroscopic findings at operation, and histopathologic findings.<sup>2</sup> Details of each patient's past surgical history, preoperative physical findings, diagnostic studies, comorbidities, medication and current indications for operation were gathered and recorded.

Location of the disease was established by colono-

scopy or barium contrast enema and small bowel radiology. (figure 1) Crohn's proctitis was diagnosed according to microscopic evidence of inflammatory lesions compatible with the disease in rectal biopsies. Perianal lesions (fistulas, abscesses, or fissures) observed before diagnosis, at the time of diagnosis, or any time during the follow-up period were recorded. For those patients undergoing surgical treatment of perianal Crohn's disease, proctoscopy was routinely performed to determine the presence of macroscopic evidence of active disease of the rectal mucosa.

The indications for surgery were grouped as obstructive, inflammatory, hemorrhagic complications of Crohn's disease, or a combination of them. Intestinal resections were performed to the limit of gross disease without concern for the presence of microscopic disease. At completion of the operative procedure surgical findings, type of operation, number of anastomoses, skip areas, and lengths of resected and remaining small bowel were recorded. Perioperative complications were determined from chart records of the patients' hospitalizations.

Long-term follow-up was conducted by personal interview in the clinics or by telephone. The event of postoperative recurrence was considered when the patient presented with bowel symptoms consistent with Crohn's disease that was subsequently verified objectively by a diagnostic procedure or was actively treated or both. Medical recurrence was considered when the patient presented with pain or bowel symptoms and inflammatory syndrome requiring specific medical treatment. Surgical



**Figure 1.** Radiologic findings in Crohn's disease involving the terminal ileum.

recurrence was defined as the requirement for re-intervention for a medically uncontrolled disease or complication.

## RESULTS

These 72 patients were treated for a total of 84 separate surgical occurrences of Crohn's disease. Specifically, 60 patients were treated for one episode of Crohn's disease, 11 patients for two episodes, and one for three separate episodes during the period of the study. 29 patients were operated on on an emergency basis.

The sites of the disease are shown in Table 1. About one in five patients had the disease located in multiple sites.

There were 78 occurrences of abdominal Crohn's disease in 68 patients. In total, 125 resections were performed including 105 intestinal anastomoses, 17 strictureplasties, 6 proctectomies and 14 ileostomies, with 3 of them being permanent. Indications for operation are listed in Table 2. Several patients had more than one

**Table 1.** Location of disease in 72 patients with Crohn's disease

Location of disease	n	%
Terminal ileum (with or without cecal involvement)	27	37.5
Colon/Rectum	12	16.6
Jejunum/proximal ileum	9	12.5
Duodenum	1	1.4
Perineum	6	8.3
Multiple sites	17	23.6
Total	72	100

**Table 2.** Indication for operation in 68 patients with intraabdominal Crohn's disease. (in some patients more than one indication for surgery was present)

Indication for operation	No of patients	%
Failure of medical management	22	22.4
Complete or partial intestinal obstruction	31	31.6
Fistula	19	19.3
Inflammatory mass	14	14.2
Intraabdominal or pelvic abscess	7	7.1
Gastrointestinal hemorrhage	2	2
Peritonitis	2	2
Cancer	1	1

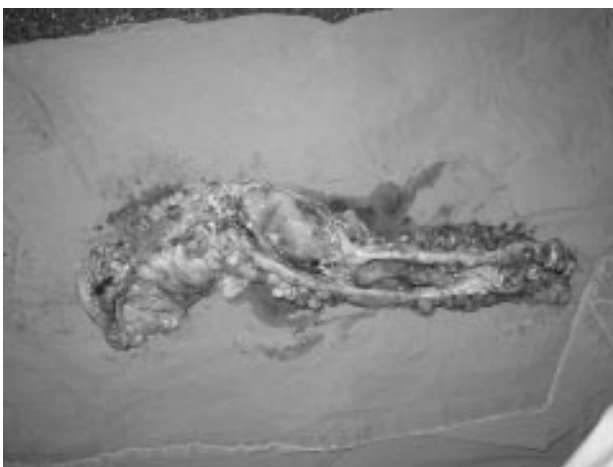
listed indication. The manifestations of complicated abdominal Crohn's disease was enteric fistula, often complex, in three cases involving the bladder, intrabdominal or pelvic abscesses, complete or high-grade intestinal obstruction, hemorrhage, intestinal perforation, and development of cancer in one patient. The four patients operated on for perianal disease proved to have intraabdominal disease which did not necessitate surgical treatment.

For those patients with small bowel disease who underwent resection, the average length of resected bowel was  $31 \pm 2$  cm. (figure 2) The majority of the resections was less than 20 cm and only one patient required resection of more than 80 cm in length.

In 6 patients, 17 stricturoplasties were performed, mostly of the Heineke-Mikulicz type and 3 of the Finney type. Resection was favoured over bypass procedures when possible. (Image 2). In fact, only one bypass was performed in a patient with critical bowel length. In the 27 patients with disease in the terminal ileum, with or without cecal involvement, ileocecal resection with anastomosis of the ileum with the ascending or the transverse colon was the procedure of choice. (figure 3)

Crohn's colitis involved 12 patients. Of those 6 required a permanent stoma, mostly because the distal rectum and the sphincteric mechanism was significantly affected by the disease. Segmental colectomy, ileorectal anastomosis and low anterior resection was used when indicated.

Instances of complex disease included patients with fistulas involving multiple segments of the large or small



**Figure 2.** Photo: Crohn's disease of the small bowel: operative specimen

bowel, fistulas involving bowel and other organs namely the bladder and the duodenum, or extending into the retroperitoneal space. Each case was treated in an individualized manner, involving resections, stomas or drainage depending on the local findings.

In patients with severe perianal Crohn's disease, symptoms such as abscesses, fistula in ano, rectovaginal fistula or anal stenosis, were treated according to the extent of the disease and the status of the proximal bowel. Setons, diverting stomas and parenteral nutrition were found to be of great value in the effort to avoid extensive resectioning. (Image 3)

Recurrences of the disease occurred in 17 of these 72 patients, resulting in 12 re-resections of the involved segment. In two of these patients a permanent stoma was finally performed. Recurrences were often localized in the site of previous anastomosis, although this was not always the case.

One postoperative death was noted in a patient who suffered from postoperative bleeding after total colectomy, terminal ileostomy and exteriorization of the sigmoid colon at the form of a mucous fistula. Other severe complications occurred in 9 patients and included adhesive small bowel obstruction, postoperative hemorrhage, pelvic abscess, abdominal abscess, sepsis, and anastomotic dehiscence.

## DISCUSSION

Crohn's disease may affect any part of the intestinal tract and is diagnosed by a combination of clinical,



**Figure 3.** Photo: Crohn's disease of the ileocecal region

biological, and morphologic features. Surgery does not cure patients with Crohn's disease and should be reserved for specific indications, most notably, complications of the disease. Surgery may provide relief of symptoms and an improvement in the quality of life, but at the cost of shortened bowel with variable amounts of diarrhea, exposure to postsurgical complications, and the risk of recrudescence of disease at a later date. The condition usually affects the terminal ileum and cecum, but the small bowel alone (in 230-355 of affected patients), or colon alone (in 25-35% of affected patients) may be involved.<sup>3</sup> The most common primary indication for operation was the failure of medical management, with urgent indications being relatively rare. This differs from the past, when the development of major catastrophes and septic complications were often cited as the primary indications for surgery.<sup>4</sup>

In these series, ileal or ileocecal involvement was the most common disease pattern encountered. This preponderance of terminal ileal disease is common in most reported series. (The majority of patients had a resection within the first year of diagnosis, indicating a high morbidity rate during the initial phase of ileocaecal Crohn's disease. This is probably best explained by the fact that a high proportion of patients had obstructing or fibrostenotic symptoms that demanded surgical intervention. Ileocaecal Crohn's disease has the reputation of increased recurrence rate (29-52%) as was the case in our series where 11 out of the 17 recurrences involved patients with this pattern of the disease.<sup>5,6</sup>

Enteric fistulas, in our series, were encountered in nearly one fourth of the patients undergoing operation for the treatment of abdominal Crohn's disease. Bowel-to-bowel fistulas may be enteroenteric, enterocolic (usually to the sigmoid or transverse colon), or enterocutaneous. Enteroenteric fistulas are the most common type. Isolated enteroenteric fistulas cause few symptoms unless associated with obstruction or sepsis, but, when managed nonsurgically, 40% of patients require surgery within 1 year, and an additional 33% require surgery within 9 years because of intractable disease. Although noninvasive management may be used selectively in minimally symptomatic patients who are at high risk from repeated surgery, most patients are advised to undergo definitive surgery for their fistulus disease. Some reports using the chimeric anti-TNF monoclonal antibody infliximab have shown resolution in as many as 68% of patients with enterocutaneous fistulas, the majority of these cases being perineal fistulas, and the medial response time was only 3 months. Novel treatment

schedules under investigation include retreatment every 8 weeks with infliximad, which may prolong the beneficial effect.<sup>5,7</sup> (In most cases, enteroenteric fistulas can be treated by en bloc resection of the affected intestinal segments. However, when this approach leads to excessive sacrifice of uninvolved intestine, the fistula should be divided, preserving the normal-appearing loops and then closing the resulting defect in the intestinal wall after debriding its edges.<sup>4</sup>

Complex fistulas and Crohn's disease of the duodenum can pose a particular challenge for the surgeon. In the first case, multiple resections with anastomosis or stomas may be necessary. Primary involvement of the duodenum severe enough to require surgical treatment is rare, and generally tends not to manifest with the penetrating disease that results in abscess formation or fistula. The duodenum can be secondarily involved, with fistulas arising from Crohn's disease elsewhere in the gastrointestinal tract, most usually from recurrent disease in the preanastomotic ileum after ileocolonic resection.<sup>8</sup>

The clinical manifestation of Crohn's disease of the colon includes abdominal pain, diarrhea, bleeding from the rectum, perianal disease and extraintestinal manifestations. The risk of colorectal cancers is increased in these patients with a 4-fold to 20-fold increased risk compared to the general population. In our series, one patient developed cancer in the sigmoid colon and was managed by subtotal colectomy and ileorectal anastomosis. Internal fistulas in Crohn's colitis are usually related to small-intestinal disease. Enterocolonic fistulas are treated by resection of the involved small bowel and primary closure of the colon unless the colonic segment is involved. Hemorrhage, stenosis and perforation remain the main indications of resection in Crohn's disease of the large bowel, as toxic colitis can initially be treated nonsurgically, and unlike ulcerative colitis, prophylactic colon resection to prevent cancer is unjustified in these patients.<sup>9,10</sup> Crohn's disease is not an indication for ileal pouch-anal anastomosis. This recommendation is based not only on the result of experience when the procedure was inadvertently performed in the presence of Crohn's disease, but also the experience with the Kock reservoir in Crohn's disease. Occurrence of Crohn's disease within a pouch reduces its distensibility and frequent anal complications could impair continence, leading finally to pouch excision and the loss of the 30 to 40cm of bowel used for the construction of the pouch. However, with proper treatment, the pouch can be preserved in about 50% of patients with fair functional result.<sup>11</sup>

Two feared complications of advanced Crohn's disease are the need for an intestinal stoma and the development of short bowel syndrome. The risk for permanent stoma is high for patients with colorectal Crohn's disease and for patients with both perianal Crohn's disease and simultaneous proctitis. As is shown in our material, surgical specialization results in managing a significant number of these patients without proctectomy.

In the hopes of reducing the frequency and severity of short bowel syndrome, the use of nonresectional options such as strictureplasty has become more common. Appropriate patient selection for this mode of treatment, however, is important. Patients with long segment disease or multifocal disease would seem most likely to benefit from nonresectional strategies. Strictureplasty should not be performed in the vicinity of inflammatory phlegmon, enteric fistula, overt perforation, or intra-abdominal abscess. Depending on the topography of the lesions strictureplasties can be associated with resections. Although the surgical recurrence rates after strictureplasty do not appear to be elevated, the possibility of the development of small bowel adenocarcinoma in the affected segment has been raised. So far, there is no evidence that this risk is increased. Alternatively, there is some indication that the relief of obstruction by strictureplasty may actually lessen the activity of the disease into the affected segment.<sup>12,13,14</sup>

In summary, the different patterns and various manifestations of Crohn's disease often pose a particular challenge for the surgeon. In spite of these difficulties, the surgical treatment of Crohn's disease, can be accomplished with low morbidity and mortality. Patterns of surgical treatment in Crohn's disease, are changing, with more emphasis on nonresectional options.

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