

REVIEW

Surgical Treatment of Crohn's Disease

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ABSTRACT

Crohn's disease is an idiopathic, incurable, chronic, inflammatory disease of the gastro-intestinal tract, whose incidence is rising around the world for unknown reasons. The characteristic transmural inflammation of Crohn's disease may occur anywhere along the digestive tract, which results in an inflammatory, fibrostenotic or penetrating phenotype. Although the degree of symptomatology varies, and may increase or disappear during the course of the disease, patients may require chronic immuno-suppressive and surgical treatment, but neither of these can cure the disease. Although the rate of surgical interventions for drug-refractory diseases has decreased over the past six decades, as well as the need for urgent surgical procedures, surgery still has an important place in the treatment of the complications of this serious ailment. After resection, which is not curative, 70 to 90% of patients will suffer endoscopic recurrence within one year, and 35% patients will have repeated intestinal resection within ten years.

Keywords: Crohn's disease, surgical treatment, fistula.

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Introduction

Crohn's disease is a chronic, uninterrupted, incurable inflammatory disorder which may affect any part of the gastro-intestinal tract¹. The basis of treatment of Crohn's disease is use of conservative means. However, every second patient with Crohn's disease may expect to have at least one operation due to complications or refractory symptoms. After resection, which is not curative, 70 to 90% of patients will suffer endoscopic recurrence within one year, and 35% patients will have repeated intestinal resection within ten years¹.

Preoperative Preparation

Although most patients who need surgical intervention for Crohn's disease are young, those who present with an acute form (e.g. with sepsis or perforation) may be seriously ill, and those who have chronic symptoms (e.g. strictures) may be undernourished. Therefore, the health status of patients must first be optimized by correcting anaemia, fluid depletion, electrolyte imbalance and malnutrition before surgery, where possible. Although some patients may need total parenteral nutrition (TPN) due to problems with intolerance of oral nutrition, long-term pre-surgical TPN should be avoided. In patients with the fistulizing disease, it has been shown that the use of exclusive enteral nutrition (EEN) reduces post-surgical septic complications².

Immunosuppressive or Biological Therapy

Most patients with Crohn's disease who need surgery are on a high dosage of glucocorticoids, immunomodulators and/or biological agents, which may affect the outcome of the operation. Before elective surgery, high, pre-operative doses of glucocorticoids should be reduced to <20 mg a day before the surgical intervention if possible, because higher doses may increase the risk of post-operative infective complications. In patients who need emergency surgery, glucocorticoids must be gradually reduced after the operation¹. Most

immunomodulators (e.g. 6-mercaptopurine or azathioprine) may be continued up to the surgery without negative consequences³.

The effect of preoperative biological agents on the surgical outcome is controversial. In some studies, preoperative use of infliximab did not increase the rate of post-operative complications^{4,5}. Some other studies have suggested the negative effects of newer biological agents, such as vedolizumab⁶, but not ustekinumab⁷. In other studies, patients who were taking glucocorticoids or infliximab before surgery had more post-operative complications and unplanned repeated admissions^{8,9}. There is also evidence that a higher preoperative level of biological agents in the serum correlates with poorer surgical outcomes⁹.

Radiological Testing

Radiological examinations of the abdomen are critical for determining the anatomical distribution and complexity of Crohn's disease. Computer Tomography Enterography (CTE) and Magnetic Resonance Enterography (MRE) are very precise for assessing lesions and complications of Crohn's disease^{10,11}.

The Surgical Approach

The usual procedures used for treating Crohn's disease of the small intestine, large intestine and rectum include bowel resection, stricturoplasty and endoscopic balloon dilation. The choice of procedure depends on the indications for surgical intervention and the location of the disease (the small intestines as opposed to the colorectal form of the disease). Approximately 4 to 23% of patients with Crohn's disease have a penetrating phenotype, characterized by perforation, abscess or fistulization¹². Emergency surgery is required to control sepsis or peritonitis resulting from perforation of the bowels. Patients with perforation of the small or large intestines undergo emergency surgical resection of the perforated segment. Patients who are hemodynamically unstable, or who have edematous bowel loops, significant

intra-abdominal contamination due to perforation, or other risk factors (e.g. malnutrition or the chronic need for glucocorticoids) should have a stoma instead of a primary anastomosis. Stable patients without these risk factors can undergo primary bowel anastomosis.

Intra-abdominal abscesses

Patients with intra-abdominal abscesses resulting from Crohn's disease should receive antibiotic therapy and a percutaneous catheter or surgical drainage of the abscess, and after that surgical resection of the relevant bowel segment^{14,15,16}. Percutaneous drainage is the preferred treatment for an intra-abdominal abscess. Percutaneous drainage may be transgluteal or transabdominal, depending on the location of the abscess. It may be repeated if necessary for all the remaining or recurring fluid collections. In contemporary practice, about 70% of abscesses related to Crohn's disease are treated using a percutaneous drain. Successful percutaneous drainage of an abscess resolves intra-abdominal sepsis, after which the affected segment of the bowel can be resected in a clean, uncontaminated field. Percutaneous drainage also allows for improvement of the patient's nutritional condition before surgery and reduces the need for using glucocorticoids perioperatively^{15,16}. Surgical drainage is performed if percutaneous drainage is not feasible or does not succeed in controlling the sepsis. For those who undergo surgical drainage of an abscess, whether resection of the bowel will be performed at the same time is determined by the surgical findings and the patient's condition. Patients who are preoperatively dependent on glucocorticoids should not be subjected to simultaneous resection of the bowel along with drainage of an abscess due to the high risk of anastomotic complications¹⁶.

Fistulas

Transmural inflammation of the bowel is connected to the development of sinus tracts. Sinus tracts that penetrate the serosa may lead to fistulas. About 15% of patients with Crohn's disease develop enteric fistulas, which most often connect the bowels with the

bladder (enterovesical fistulas) or the vagina (enterovaginal fistulas)¹⁷ (Figures 1,2). Although biological agents are effective against fistulizing Crohn's disease in about half the patients, refractory fistulas require resection of the affected segment of the bowel, and suturing of the fistula opening in the neighbouring organ¹⁸. Perianal manifestations of Crohn's disease include perianal fistulas, perianal abscesses and lesions of the anal canal (anal fissures and anal strictures). For most patients with Crohn's disease who have a perianal fistula, complete closure of the fistula is the primary aim of treatment. For some patients with complex perianal fistulas, it is only possible to achieve symptomatic improvement (e.g. less rectal pain, less secretion) and a better quality of life, but without complete healing or closure of the fistula¹⁹.

Strictures

The transmural inflammatory process that characterises Crohn's disease often results in fibrous strictures, which may lead to bowel obstruction (Figure 3). Although the phenotype of strictures appears in 5 to 24% of Crohn's disease patients, it is most responsible for the development of short bowel syndrome. Inflammatory strictures are primarily treated with medication, whilst fibrostenotic strictures are treated by endoscopic dilation, or surgically^{12,20}. Colorectal strictures linked to anastomosis are usually treated by endoscopic dilation. Other colorectal strictures connected with Crohn's need endoscopic evaluation by biopsy or brush biopsy; strictures which do not permit endoscopic observation are surgically removed²¹. Suspicion of a malignant stricture or fistula in patients with Crohn's disease requires resection of the bowel segment, including the lesion, instead of strictureplasty or intestinal by-pass²². Patients with medically refractory Crohn's enteritis usually require resection of the small intestine because strictureplasty and endoscopic dilation are contraindicated in the presence of an active inflammation. Patients who develop acute fulminant colitis or toxic megacolon as a result of Crohn's disease require emergency surgery in order to prevent sepsis, perforation or death. Total colectomy with a terminal ileostomy is the procedure of choice in this life-threatening situation¹.

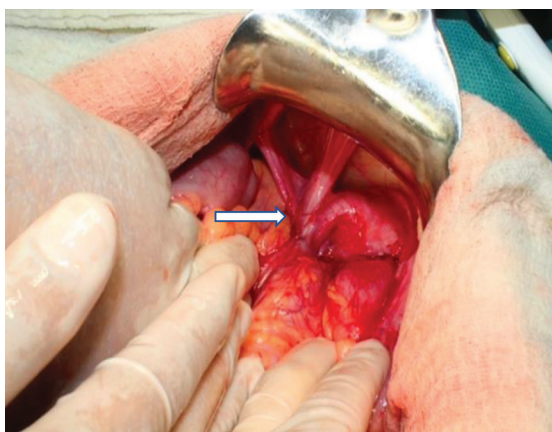


Figure 1. Entero-enteral fistula.

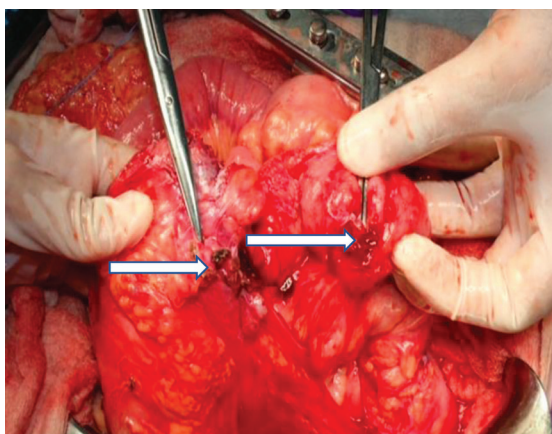


Figure 2. Entero-enteral communication.



Figure 3. Stricture of the small intestine.

The Surgical Technique

Resection of the small intestine and ileocecal resection for Crohn's disease may be performed as an open procedure or laparoscopically; we recommend the laparoscopic approach whenever it is available. In comparison to open surgery, laparoscopic resection is related to faster recovery, fewer cases of bowel obstruction, and fewer postoperative hernias^{23,24}.

For all resections of the small intestines or ileocecal resection, we suggest macroscopic inspection, and not histopathologically guided resection, where determination of the margins of resection is concerned. A wide or histologically negative margin may reduce the bowel reserve without reducing recurrence²⁵. The anastomosis technique (latero-lateral, termino-terminal, or Kono-S) is determined by the clinical scenario and the surgeon's preference. The resection techniques used for treating Crohn's colitis or proctitis include segment colectomy, total colectomy with ileorectal anastomosis, total proctocolectomy with a terminal ileostoma and proctectomy. The choice depends on the indications for surgery, the location of the disease and whether the rectum is affected or spared²⁶.

The Laparoscopic Approach

In comparison with open surgery, laparoscopic surgery has the short-term advantages of reducing morbidity, a faster recovery and lower cost, as well as the long-term advantage of fewer small bowel obstructions and postoperative hernias. Laparoscopic bowel resection is being used increasingly frequently for treating patients with Crohn's disease. Therefore, the laparoscopic approach is desirable for bowel resection when the appropriate expertise is accessible²⁷.

Conclusion

Surgery does not cure Crohn's disease. The endoscopic rate of recurrence was as high as 80% one year after surgery, and the clinical rate of recurrence was 10

to 15% a year. Even after surgery, patients will need continuous drug therapy or at least regular endoscopic monitoring to reveal any recurrence. Patients with long-term Crohn's disease, especially in the large intestines or rectum, are subject to developing neoplasms before or after surgical interventions. Therefore, post-surgical endoscopic monitoring is important for early discovery of both a recurrent disease and malignancies.

Conflict of interests

The author has no relevant financial or non-financial interests to disclose.

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