Colonic Crohn's Disease

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ABSTRACT

Crohn's disease is an inflammatory disease of the gastrointestinal (GI) tract of uncertain etiology. It can affect any portion of the GI tract, involving the colon in ~60% of cases. Diagnosis can be unclear, but suspicion can be raised based upon clinical, endoscopic, and pathologic findings. Initial management is often medical, with surgery reserved for patients with colonic complications of Crohn's disease, such as hemorrhage, fulminant colitis, abscess or fistula, stricture, and malignant transformation. The operative choice and conduct depends upon the clinical presentation and intraoperative findings. The extent of resection is controversial, but segmental resection is appropriate in selected cases.

KEYWORDS: Crohn's disease, colon, colitis, surgery

Objectives: On completion of this article, the reader should be able to summarize the surgical management of colonic Crohn's disease.

OVERVIEW

Crohn's disease is an inflammatory disorder of unclear etiology, involving the gastrointestinal (GI) tract. It can involve any portion of the GI system from the mouth to the anus, although it is most common in the ileocecal area. Approximately 60% of patients with Crohn's disease suffer from colonic involvement. Approximately half of those patients have synchronous involvement of the small intestine; the others have disease limited to the colon. Colonic Crohn's disease can involve the entire colon (pancolonic) or part of the colon (segmental). Like Crohn's disease elsewhere in the gastrointestinal (GI) tract, it is often associated with skip areas of normal histology, both grossly as well as microscopically. In treating Crohn's colitis, the surgeon must differentiate it from ulcerative colitis. This differential can be done based upon endoscopic, radiographic, histologic, and clinical findings. Once the diagnosis is established, medical and surgical interventions are undertaken as indicated. For the most part, operation for Crohn's disease is not curative, but is used to treat the symptomatic manifestations of prolonged colonic inflammation.

Colonoscopies have become very widely available and utilized over the past three decades. When mucosal inflammation is encountered, the differential diagnosis is quite broad and covers multiple categories of pathology. However, after eliminating other causes which are often more specific to diagnoses such as infectious colitis or ischemic colitis, idiopathic colitis may become working diagnosis. At this point, the differential diagnosis of idiopathic colitis includes ulcerative colitis, Crohn's colitis, and indeterminate colitis. By carefully examining the pattern of inflammation and the appearance of the mucosa during the colonoscopy, the endoscopist can get a sense of whether ulcerative colitis or Crohn's disease is responsible for the inflammation. Biopsies taken at the time of endoscopy will often confirm the diagnosis or clarify the situation and guide the physician. Intubation of the ileocecal valve and evaluation by inspection and biopsy of the distal 10 to 20 cm of ileum should be

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pursued as involvement of the terminal ileum by more than "backwash ileitis" makes Crohn's disease more likely. When the clinical picture is one of inflammatory bowel disease, a determination between ulcerative colitis and Crohn's colitis is essential as the management strategies can be very different, particularly when surgical options are entertained.

Most patients with Crohn's disease undergo colonoscopy during the evaluation of their symptoms. Macroscopically, the endoscopist may identify deep ulcerations, cobblestone appearance of the mucosa, normal vasculature, skip areas (areas of normal mucosa interspersed between areas of inflammation), and pseudopolyps. Additionally, strictures and fistulae may be observed. In ~40% of patients with Crohn's colitis, the rectum is spared from inflammation in contrast to the findings with mucosal ulcerative colitis (MUC) of universal rectal involvement (although some patients using topical rectal treatments may appear to have rectal sparing).

Biopsies are typically obtained in patients with inflammation identified at the time of colonoscopy. Under the microscope, the classic findings of noncaseating granulomas help solidify the diagnosis of Crohn's disease, but they are present in only 15 to 36% of patient's biopsies.[1] The other hallmark that distinguishes Crohn's disease from MUC, although not by colonoscopic biopsy, is the involvement of the full thickness of the wall. Further findings suggestive of Crohn's disease are deep ulcers or fissures, goblet cell hyperplasia, and an increased secretion of mucus.

With improved medical therapy for Crohn's disease, surgical management of colonic Crohn's disease is often limited to intervention for complications such as colonic perforation or abscess (or resultant fistula), GI hemorrhage, colonic obstruction or stricture, or fulminant colitis. These complications can occur as a result of either acute exacerbations or as a result of chronic inflammation. A surgeon caring for patients with Crohn's disease must, therefore, have a general knowledge of appropriate treatment for various complications, as these complications can present in an urgent fashion.

HEMORRHAGE

Severe, life-threatening hemorrhage is fairly uncommon in Crohn's disease, with most studies reporting an incidence of 1 to 6% of severe hemorrhage.[2–4] In one study,[2] 1.1% of patients with Crohn's colitis (1.9% of all patients with any colonic involvement) had severe hemorrhage requiring more than 4 units of blood transfusion. Patients presenting with acute hemorrhage range in severity depending upon amount and rate of blood loss. A patient who is hemodynamically stable and who is having a relatively small amount of bleeding is often managed as an outpatient, whereas a patient with severe hematochezia and potentially unstable hemodynamics must be treated more urgently. When a patient presents with severe hematochezia, the first step in management, as with any patient with serious gastrointestinal hemorrhage, must be immediate evaluation and prompt resuscitation. Operation is required for control of hemorrhage between 20 to 57% of the time.[2,4] Appropriate imaging or localizing studies (such as endoscopy, angiography, nuclear medicine scans) should be undertaken once the patient is resuscitated, if possible. Localization studies are usually in the form of endoscopy or angiography, and are appropriately guided by knowledge of the patient's disease pattern if known and by the rate, character, and severity of the hemorrhage. Both modalities have the advantage of being potentially therapeutic and being able to localize a source of bleeding prior to surgical resection. If the bleeding has been controlled by nonoperative methods, the patient must be monitored for recurrent hemorrhage that occurs in up to 35% of patients.[4] If nonoperative methods are unsuccessful, operation is required to resect the bleeding portion of colon unless the bleeding spontaneously ceases. Decision to operate is based on the patient's condition on which segment to resect, and whether or not to anastomose the bowel. This algorithm is based on the extent of disease, the patient's condition including the degree of immunosuppression, and localization of the site. It is almost never necessary to perform a proctectomy for acute hemorrhage.

FULMINANT COLITIS

Fulminant or toxic colitis can occur as a complication of inflammatory bowel disease (IBD); it is found more commonly in patients with MUC than in patients with Crohn's disease.[5–7] Patients with toxic colitis are typically recognized as having profuse bloody diarrhea and systemic toxicity.[6] In up to 30% of patients with toxic colitis associated with IBD, toxicity occurs as the initial presentation of the disease.[8] After appropriate resuscitation, a course of medical management should be attempted in patients who respond appropriately to resuscitative efforts and who lack evidence of perforation or peritonitis. These efforts should include broad-spectrum antibiotics, fluid resuscitation, and blood transfusions as appropriate, as well as specific therapy for IBD including steroids, and close monitoring and careful frequent serial examinations to evaluate for worsening condition.

Patients with hemodynamic instability, evidence of perforation or impending perforation, worsening sepsis, or peritonitis should be urgently taken to the operating suite for resection. Urgent operations for fulminant colitis usually entail an abdominal colectomy with end ileostomy, though other options have been described. Turnbull described multiple decompressive stomas to avoid a laparotomy at the initial surgery.[9]

This option is rarely used today.[10] Many authors have shown that fecal diversion with ileostomy can be successful in patients with severe colitis, but who are not fit for major resective efforts.[11,12] Most patients who respond to diversion ultimately require subsequent resection, leading most authors to recommend that diversion, when used, should be considered as a bridge to improve the patient's condition for a definitive resection. In performing the more common abdominal colectomy with ileostomy, there are multiple options for management of the rectal stump. Traditionally, the rectosigmoid stump was brought to the skin as a second stoma (mucous fistula) for decompression. However, the rectal stump can also be oversewn and left in place in the pelvis, or alternatively, it can be buried in the subcutaneous tissue at the inferiormost portion of the incision. This maneuver will allow the rectal stump to be easily located during further operations. In a recent study that compared leaving the rectal stump in the pelvis versus bringing it to the subcutaneous tissue, it was shown that both are safe. However, fewer pelvic infections occurred with the stump left in the subcutaneous tissue, although more wound infections were noted.[13] The authors concluded that morbidity was less with an incisional infection compared with a pelvic abscess; therefore, the subcutaneous placement of the stump was preferable. Basically, if the stump opens it is preferable to have the sepsis in the subcutaneous tissues rather than in the pelvis.

Once the patient has recovered from the toxic state, an ileorectostomy is possible, assuming that the rectum is suitable for anastomosis. In a group of 144 patients undergoing abdominal colectomy for Crohn's disease (multiple indications), 118 (82%) eventually underwent ileorectal anastomosis.[14] Recurrence of the Crohn's disease was common, but 63% of the patients still had functioning ileorectal anastomoses at 10 years of follow-up. Interestingly, patients placed on 5-aminosalicylic acid derivatives had a lower rate of recurrence, underscoring the importance of good medical management of Crohn's disease after operation.

ABSCESS OR FISTULA

Perforation of the colon is another possible complication of Crohn's colitis. Although free perforation of the colon is relatively uncommon,[5,15] perforation does commonly occur and can lead to complications such as abscess or fistula. Abdominal or pelvic abscess can present with a wide range of clinical findings, from low-grade fever and mild abdominal pain to florid sepsis and peritonitis. Each patient must be evaluated for initial stability, and appropriate resuscitation or intervention must be undertaken. In most cases of abscess associated with Crohn's colitis, after initial antibiotics and radiologic evaluation, a decision between surgical drainage and percutaneous drainage must be made. Gutierrez recently compared patients with Crohn's disease and abdominal or pelvic abscess who were drained by either surgical or percutaneous interventions.[16] Percutaneous drainage was shown to be as effective as surgical drainage, but up to one third of patients who underwent successful percutaneous drainage required operation within one year of drainage compared with less than 15% of patients who initially underwent open surgical drainage.

Patients who are hemodynamically unstable at the time of presentation, and those who do not improve with or are not candidates for appropriate nonoperative management, may require operative intervention. In this case, the surgeon must drain the abscess and then determine whether resection or diversion is more appropriate. In most cases, resection is possible and preferable. However, in patients with a large phlegmon, the inflammation may have involved multiple loops of adjacent bowel and retroperitoneal or pelvic structures, making a safe bowel resection treacherous and inadvisable or even technically impossible. In these circumstances, it is often advisable to proceed with drainage of any localized abscess and to perform a diversion, via stoma or occasionally internal bypass, and deal with the diverted portion at a later date once the inflammation has subsided. In cases where a resection of the active Crohn's segment is safe, resection can be performed with subsequent stoma or anastomosis depending upon the condition of the patient and the distal bowel.

Fistulae involving the colon in patients with Crohn's disease are usually secondary to small intestinal disease; however, primary colonic fistulae can also complicate Crohn's disease of the colon, for example, a colovesicular fistula. Preoperative colonoscopy has been shown to be essential to differentiate which patients have primary colonic Crohn's disease from those where the colon was secondarily involved by the small intestine, thereby guiding extent of colon resection.[17] In patients with primary Crohn's disease associated with colonic fistula, once other causes of fistula have been excluded (e.g., diverticulitis), a limited resection to include the fistulizing portion of colon should be undertaken. The "innocent" organ into which the colonic segment has fistulized can usually be closed primarily, or in cases of vaginal or bladder involvement can even be left to close by secondary intention. When the colon is secondarily involved due to small bowel Crohn's disease (most commonly ileosigmoid fistula), and the colon does not have mucosal disease, the involved colon wall can be locally repaired or a short segmental resection can be performed. The choice is often dictated by the condition of the colon and the extent of pericolic inflammation.

STRICTURES

Stricturing Crohn's disease can occur in the colon just as it does in the small intestine. In any patient with a new

colonic stricture (especially in the setting of IBD), malignancy must be excluded. The incidence of colon cancer in patients with Crohn's colitis ranges from ~2 to 7%.[18,19] When a colonic stricture is discovered, evaluation is best performed via colonoscopy with biopsies and potentially brushings to evaluate for malignancy (see below). At the same time, the rest of the colon should be evaluated for active inflammation, as that may determine the extent of resection at time of operation. Most strictures can be managed by segmental resection and primary anastomosis, assuming there is not active inflammation in the area of anastomosis, and assuming the anorectum is not severely diseased. Strictures occurring in the setting of pancolitis or in conjunction with other pathology of the colon may best be treated by abdominal colectomy and ileorectal anastomosis, or in cases involving the rectum as well, proctocolectomy and ileostomy.

Another alternative for treating colonic strictures in the setting of Crohn's disease may be endoscopic balloon dilation. A recent study from Japan showed that it is feasible, but that primary strictures as well as long strictures were at risk of complication. The best results were seen with anastomotic strictures and short strictures,[20] but the authors caution that further investigation is needed.

CANCER: RISK, SCREENING, AND SURVEILLANCE

Any patient with longstanding colonic inflammation is at increased risk for developing malignant changes within the colon. It has long been believed that patients with MUC have a higher risk of colon cancer as compared with patients with Crohn's colitis. In fact, some population studies have shown no increased risk of colorectal cancer in patients with Crohn's colitis.[21,22] Other studies, however, have suggested that Crohn's colitis does indeed portend a higher risk of colorectal carcinoma.[23,24] Most experts now feel that the risk of developing cancer increases with the length of time that colitis is active, irrespective of the type of inflammation, although the risk seems to be negligible until after 8 years of disease. Therefore, in patients with prolonged colitis, surveillance colonoscopy should be considered after 8 years of disease. In one group of Crohn's patients undergoing surveillance colonoscopies, 22% developed either dysplasia or cancer during the study period (four surveillance exams).[25] This knowledge has led to a general recommendation for screening and surveillance for cancer in patients with Crohn's disease of the colon. As mentioned above, the first examination usually occurs 8 to 10 years after the onset of disease, with follow-up examinations at 1- to 2-year intervals. Most endoscopists recommend biopsies of every lesion identified, including strictures. Furthermore, random biopsies every 10 cm to look for dysplasia are also recommended. Whenever possible, these surveillance colonoscopies should be performed during remission to aid in the interpretation of the biopsy specimens by the pathologist.

RESECTION FOR COLONIC CROHN'S DISEASE

The original studies that assessed the margins of resection for Crohn's disease were relative to small bowel resection. Multiple studies have shown that a limited resection to grossly uninflamed intestine is adequate for treatment of Crohn's disease of the small intestine, with a lower risk of short bowel syndrome.[26–30] Segmental resection for colonic Crohn's disease has not been accepted as standard care and was felt to be inferior to total abdominal colectomy. Segmental resection is associated with a higher risk of surgical recurrence,[31,32] but the patient's quality of life was often sacrificed with abdominal colectomy to achieve a lower recurrence rate. One study found that segmental resection led to a higher incidence of recurrence, but that the quality of life was improved; the authors concluded that segmental resection is the operation of choice in suitable patients.[31] A more recent study found that there was no increased risk for reresection with segmental colectomy and that patients had less symptoms and improved functional outcome.[33] Hence, segmental resection should be considered for patients with segmental colonic disease. However, it is important to counsel the patient that there may be an increased risk of needing further treatment, and to stress the importance of maintenance or prophylactic therapy for Crohn's disease postoperatively to attempt to reduce the risk of recurrence.

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