



Surgical options in the treatment of ulcerative colitis



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ABSTRACT

Children and young adults with ulcerative colitis tend to present with more extensive colonic disease than an adult population. The need for surgical intervention in the pediatric population with ulcerative colitis occurs earlier after diagnosis and has a greater incidence than a comparably matched adult population with an estimated need for colectomy at 5 years following diagnosis of 14–20%. Perhaps, even more than the adult population, there is a desire to restore intestinal continuity for the pediatric patient to achieve as healthy and normal quality of life as possible. With surgery playing such a prominent role in the treatment of ulcerative colitis in this age group, an understanding of the surgical treatment options that are available is important. The surgeon's awareness of the complexities of the different operations associated with proctocolectomy and reestablishing intestinal continuity may help to avoid early complications and minimize the risk of less than ideal long-term outcomes.

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The surgical treatment of ulcerative colitis has been evolving over the last 50 years. Ulcerative colitis, a mucosal disease confined to the colon and rectum, is amenable to a “surgical cure” (no colon, no colitis), unlike Crohn disease which affects the entire alimentary tract. In the past, it was identified that removing the colon and diverting the fecal stream would allow the inflammatory process of the rectum to resolve or become treatable locally. Once the fecal stream was reestablished, the inflammatory process often returned in the rectum over time. The initial surgical option, until the late 1960s was total proctocolectomy and an ileostomy. This operation may still be the best option for some patients, although surgery to maintain intestinal continuity is the primary goal for most children and young adults.

Indications

Indications for removing the colon in patients with ulcerative colitis have been fairly well established. The reasons may be emergent, urgent, or elective. Over the course of the disease anywhere from 20% to 45% of all patients with ulcerative colitis will need surgery.^{1–4} Many patients presenting with newly discovered colitis or acute flare of their disease can be treated with medical therapy and go into remission. The medical therapy of

ulcerative colitis is discussed further in other sections of this journal.

The most common indication for surgery is “failure of medical treatment”, either as significant ongoing symptoms despite medical therapy or unacceptable side effects to medical treatment. Emergency surgery for ulcerative colitis can become necessary due to colonic perforation, ongoing severe bleeding, or toxic megacolon. A certain percentage of patients will fail the initial medical treatment or present with an uncontrolled acute flare of the disease and, despite optimal medical therapy, will require urgent surgery to treat the poorly controlled colitis.⁵ The safest surgical option in the emergency situation is an abdominal colectomy with ileostomy and Hartmann pouch, preserving the rectum for later reconstruction. In the population with a need for urgent surgical treatment, the options for immediate reconstruction or diversion will be determined by patient factors, including nutritional status, patient's desires, and the degree and length of corticosteroid therapy among other things.

Even in patients with long-standing, well controlled disease, there is a risk of cancer developing.⁶ This risk seems to be higher in patients with pancolitis. Approximately 5% of patients will develop cancer related to the colitis. The risk of developing neoplasia also increases with duration of the disease.⁷ Patients often develop mucosal dysplasia before developing cancer, and surgery should be considered if these changes are found on surveillance colonoscopy.⁸ Recent studies have suggested that the new biologic agents, like the tumor necrosis factor inhibitors, may decrease the risk for both colectomy and cancer development.^{9–12}

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Surgical options

Removing the entire colon and rectum will cure the disease of ulcerative colitis. For many years the only option for patients was a permanent ileostomy. In the late 1960s, the concept of a “continent ileostomy” was developed. The most successful of these continent ileostomy constructs was the Kock pouch that allowed the patient to pass a catheter into the stoma and empty the reservoir at a convenient time, instead of wearing an external appliance.^{13–15} Many patients had excellent outcomes from this procedure; however, particularly in the early experience, a significant number of patients had complications or required multiple operations to obtain a good result.^{16–19}

In 10–29% of the patients, even though the colitis was gone, a new inflammatory process developed within the continent pouch itself and was called “pouchitis.” This may affect any ileal pouch in patients with ulcerative colitis, but rarely complicates the same operation for polyposis syndromes.^{20–22} The pouch inflammation often responds to a course of oral antibiotics. The exact cause of this problem remains uncertain and will be discussed in another chapter in this issue.

In the late 1970s, some surgical centers proved the feasibility of an ileoanal anastomosis after total colectomy and rectal mucosectomy to treat ulcerative colitis.^{23–27} The concept allowed patients to evacuate normally and avoid having a lifelong stoma. One key to a successful ‘restorative proctocolectomy’ was removing the inflamed mucosa from the rectum while preserving the muscles of continence and the normal innervation in the pelvis that would allow the patients to sense and control their bowel movements. Using part of terminal ileum either directly or as a reservoir to replace the rectum was proposed and proved. By constructing an internal pouch, it was felt the overall number of bowel movements would be decreased as compared to direct ileoanal anastomosis without reservoir.^{28–30}

While Martin’s early report first used a straight ileoanal anastomosis,²⁵ Parks and Nicholls²⁶ described a folded S-pouch, acknowledging the previous work of Kock proving that ileal pouch formation could be associated with near-normal intestinal function. The “J” pouch was described shortly thereafter,³¹ and other modifications were developed over time which included a “W” configuration (Figure).^{32,33} It was hoped that these more complicated constructions would have advantages, acting as a larger reservoir and decreasing the number of daily bowel movements. However, over time, many surgical groups have gone back to the

original J-pouch as an easier intestinal reconstruction with equally good outcomes. The S-pouch reservoir may develop problems with the efferent limb lengthening and kinking over the sphincter complex, contributing to outlet obstruction. In one series, it seemed that the larger volume of the S-pouch led to more problems with pouchitis,³⁴ although another group noted that chronic pouchitis was seen more frequently with a J-pouch construction.³⁵ A few groups do not use a pouch,^{36,37} but other authors found that patients without an ileoanal reservoir typically have a greater number of daily bowel movements.^{29,38}

The development of improved stapling devices has facilitated the construction of the J-pouch and allowed surgeons to use the circular stapling devices for a distal ileorectal anastomosis as well. Bleeding from the staple lines is less of a problem with modern stapling devices. There are no prospective studies to identify advantages or disadvantages between the stapling devices and hand sewn ileoanal anastomosis. One retrospective analysis of a large database did not show any difference, except for a higher incidence of anal strictures with the hand sewn anastomosis.³⁹

The procedure for the total colectomy and ileorectal or ileoanal anastomosis has evolved along with the development of minimally invasive laparoscopic surgery techniques.^{40–42} It is currently possible to do the operation with good outcomes laparoscopically or with a traditional open approach. Many people do a “laparoscopic-assisted” operation to remove the colon and mobilize the small bowel. A small incision is then made to remove the colon specimen, construct the pouch, and complete the anastomosis. This allows for a more cosmetic lower abdominal Pfannenstiel-type incision, which many patients prefer. A “hand assisted” laparoscopic technique is also used in some centers.⁴³ In a few select centers, “single-port” laparoscopic surgery has been described in children and adults.^{44,45}

Technical aspects

One of the essential elements of this operation is adequate mobilization of the small intestine to be able to bring down the pouch to the anus or rectum without any tension and with adequate blood supply. Care has to be taken to identify the appropriate blood vessels that may need to be divided for mobilization while preserving adequate blood supply to the pouch. Intraoperative Doppler probes can be useful in identifying the

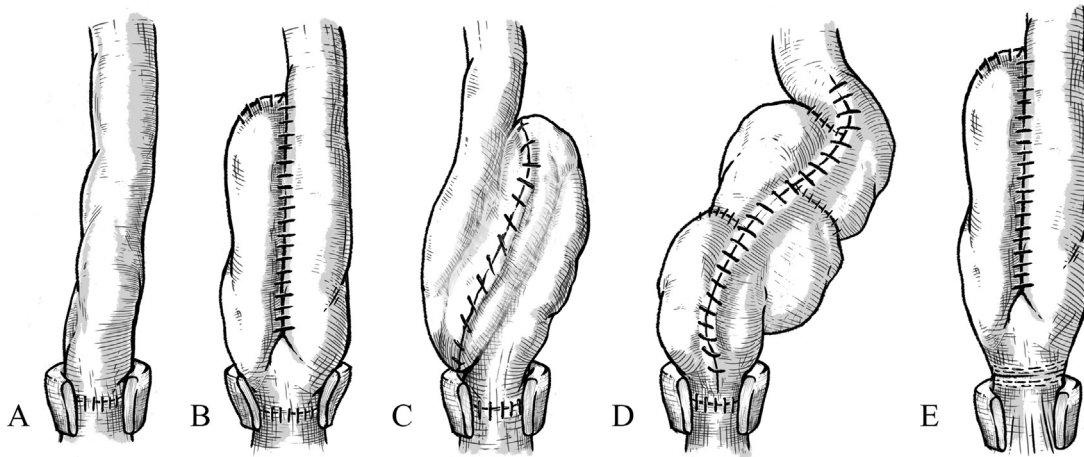


Fig. Common procedures to restore intestinal continuity following proctocolectomy. (A) Direct or straight ileoanal anastomosis without reservoir. (B) Utsunomiya’s J-pouch with side-to-end ileoanal anastomosis. (C) Parks’ S-pouch ileoanal anastomosis with the efferent limb in the sphincter complex with an end-to-end ileoanal anastomosis. (D) Quadruple limb W-pouch ileoanal anastomosis with side-to-end anastomosis as described by Nicholls and Harms. (E) Distal rectal-ileal pouch stapled anastomosis with the stapled anastomosis above the sphincter complex.

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