Pouch-Anal Anastomosis Without Diverting Ileostomy

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Ileal diversion is an important adjunct to restorative proctocolectomy but may produce increased morbidity and requires a second-stage closure. This study reports results utilizing a one-stage procedure designed to retain the benefits of proximal decompression without the liabilities of additional surgical procedures. Eight patients, three men (with ulcerative colitis) and five women (one with familial polyposis coli and four with ulcerative colitis), were selected for the single-stage restorative proctocolectomy with intraluminal decompression in lieu of diverting loop ileostomy. The abdominal proctocolectomy was performed to the level of the anorectal junction. In five patients, the rectum was closed using the TA 55™ (U.S. Surgical Corporation, Norwalk, CT), 4.8-mm stapler. A J-pouch was constructed with multiple firings of the GIA 90™ (U.S. Surgical Corporation) stapler. These patients had continuity restored utilizing a transanal, circular stapler. Three patients had an S-pouch constructed by suture technique. Fecal diversion was accomplished with a 25-mm intraluminal bypass tube (Coloshield™; Deknetel, Fall River, MA) in all cases. There was no mortality. There were no anastomotic complications or morbidity related to the bypass tube. The tube dislodged and passed between days 18 and 26 (mean, 22.1 days). All patients had three to six bowel movements per 24 hours, and all are continent day and night. This experience suggests that, in selected patients, the intraluminal bypass tube may be an excellent alternative to diverting ileostomy. [Key words: Coloshield; Intraluminal decompression; J-pouch; Restorative proctocolectomy]

Temporary proximal ileal diversion is commonly performed as an adjunct to restorative proctocolectomy. Ileostomies permit pouch and pouch-anal anastomotic healing in a stool-free environment. They prevent undesirable consequences of early postoperative sphincter dysfunction. However, fecal diversion has real morbidity[1-4] and requires a second hospitalization for surgical closure.

This report describes an initial group of patients in whom pouch-anal reconstruction was accomplished utilizing an intraluminal bypass tube in lieu of a temporary ileostomy.

MATERIALS AND METHODS

Eight patients who underwent pouch-anal reconstruction without diverting ileostomy are included in this report. Five were selected for a single-stage restorative proctocolectomy with intraluminal decompression in lieu of diverting loop ileostomy. There were two men, aged 44 and 56 years, with ulcerative colitis and three women, aged 30, 38, and 61 years, two of whom had ulcerative colitis and one of whom had familial polyposis coli. Four patients were receiving steroids at the time of the operation.

Abdominal proctocolectomy was performed to the level of the anorectal junction. The anorectal junction was closed using the TA 55™, 4.8-mm roticulator stapler. A J-pouch was constructed with multiple firings of the GIA 90™ stapler (Fig. 1). Intestinal continuity was restored utilizing the transanal CEEA™ (U.S. Surgical Corporation) stapler (Fig. 2).

Fecal diversion was then accomplished utilizing a 25-mm intraluminal bypass tube. The tube was inserted approximately 15–25 cm proximal to the J-pouch (Fig. 3). The ileum was either completely divided (two patients) or partially divided (three patients) and everted for approximately 3–5 cm (Fig. 4a). The intraluminal bypass tube was then inserted in its folded configuration (Fig. 4b). A watertight anastomosis between the free edge of the Coloshield™ and the everted edge of the ileum was then created using a running, locked, 2-0 polyglycolic acid suture which incorporated the mucosa and the submucosa (Fig. 4c). Ileal continuity was then restored using a single-layer, 3-0 polyglycolic acid suture (Fig. 4d). Before completion of the anterior layer of the anastomosis, the
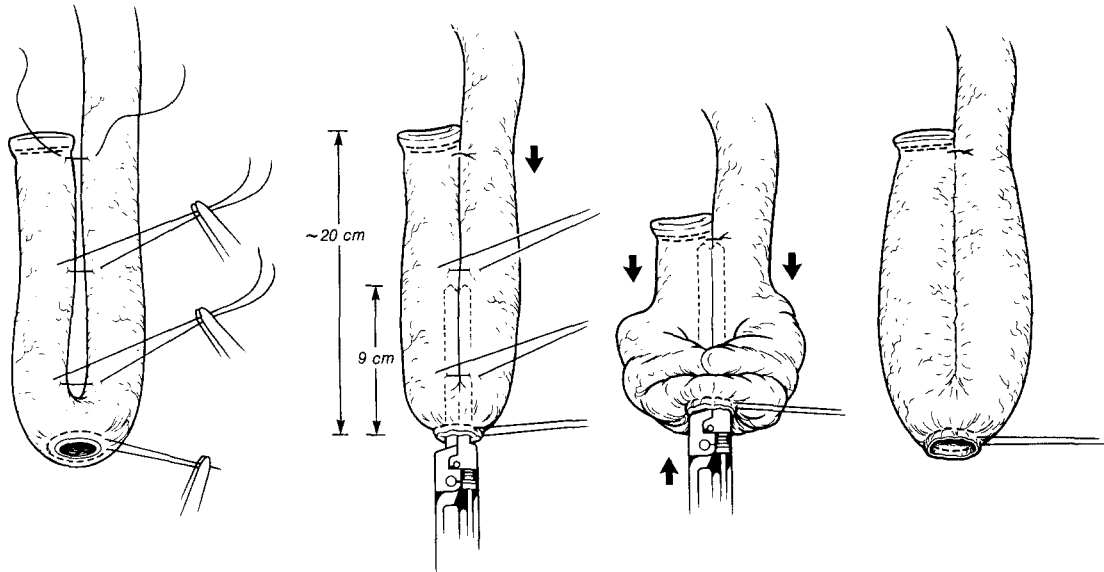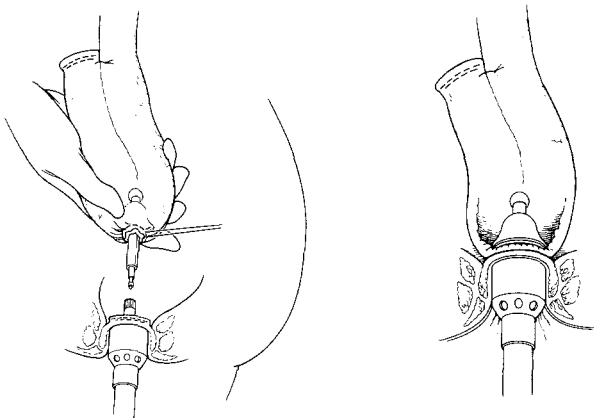
Figure 1. J-pouch construction.

Figure 2. Stapled pouch-anal anastomosis.

intraluminal bypass tube was unfolded and passed through the J-pouch and J-pouch-anal anastomosis (Fig. 5a and b). The anastomosis was then completed (Fig. 5c) and the intraluminal bypass tube was trimmed approximately 6 inches from the anal verge (Fig. 5d) and placed in a perineal appliance (Fig. 6). A transanal pouchogram was performed between 7 and 12 days postoperatively to assess pouch and pouch-anal anastomotic healing (Fig. 7). The intraluminal bypass tube was then trimmed and replaced in the anal canal.

Three other patients were too ill at the time of their first operation to undergo a single-stage procedure. Two women and one man (aged 21–54 years) with ulcerative colitis had an emergency subtotal colectomy and Brooke ileostomy as a first-stage procedure. Two of these had a simultaneous mucosal proctectomy. The other patient was left with an intact rectum at the first-stage procedure,
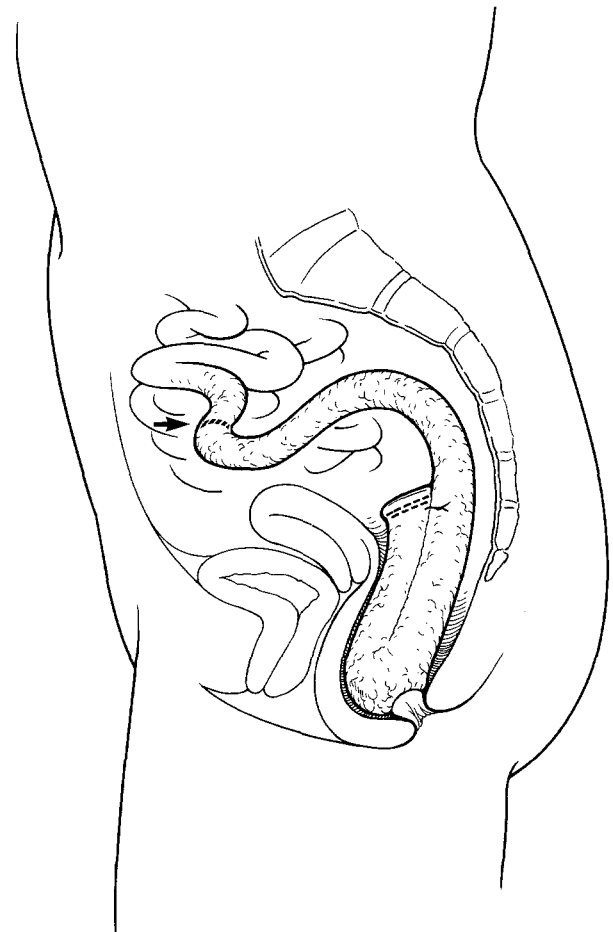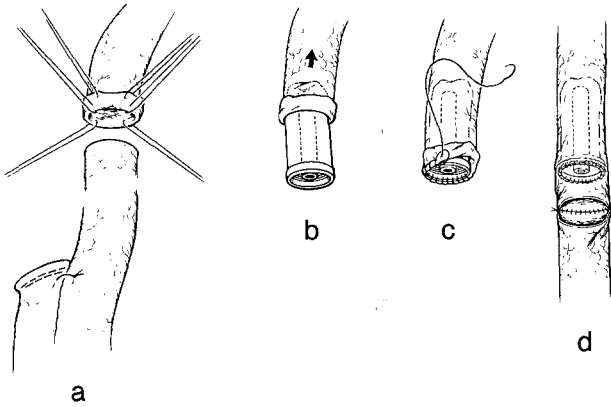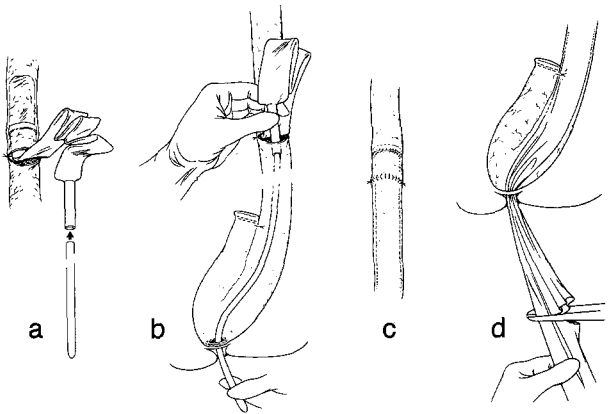

Figure 3. Completed J-pouch-anal anastomosis. Arrow indicates site of insertion of intraluminal bypass tube.

and mucosal proctectomy was performed as part of the second-stage operation.
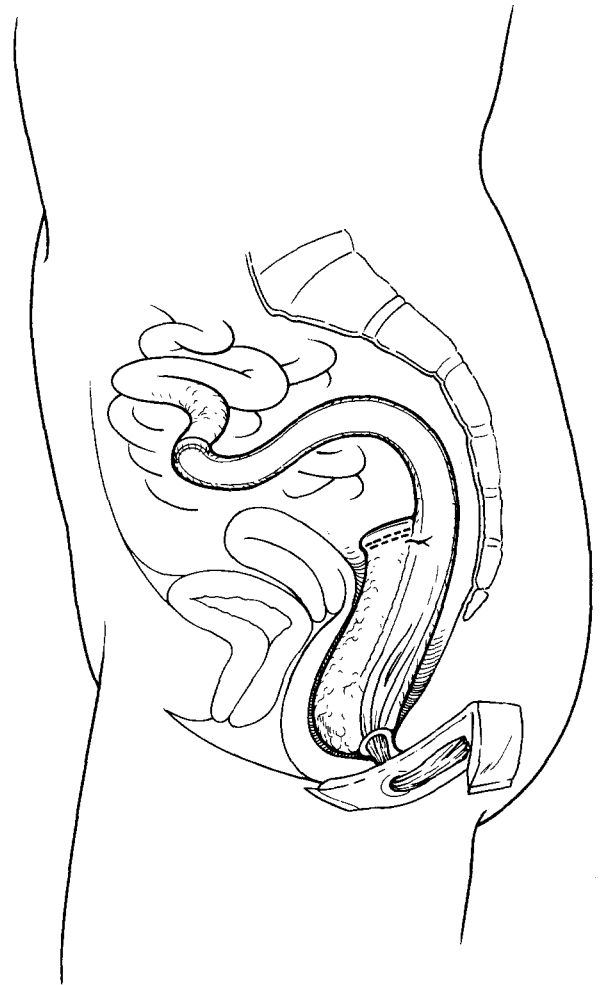
At an average of 8.7 months postoperatively (range, 4–14 months), patients were returned to

**Figure 4.** Insertion of intraluminal bypass tube.

Figure 5. Insertion of intraluminal bypass tube (continued).

Figure 6. Bypass tube in place.

the operating room for re-establishment of intestinal continuity after creation of a modified S-pouch with a short efferent limb. None of these patients was receiving steroids at the time of pouch-anal reconstruction. The posterior wall of the reservoir was fashioned using three 15-cm lengths of terminal ileum approximated with interrupted 2-0 polyglycolic acid serosal sutures. The anterior wall of the reservoir was opened using cutting diathermy. Four stay sutures were inserted into the lumen of the afferent limb of the S-pouch. Gentle traction was placed on these sutures to evert a cuff measuring approximately 4 cm (Fig. 8a). A 25-mm intraluminal bypass tube was unfolded and sutured to the everted cuff using the technique previously described (Fig. 8b). After the bypass tube was delivered through the efferent limb of the S-pouch, the anterior wall of the reservoir was closed with 2-0 polyglycolic acid sutures. The S-pouch was then delivered into the pelvis, the bypass tube passed through the anus, and the ileoanal anastomosis
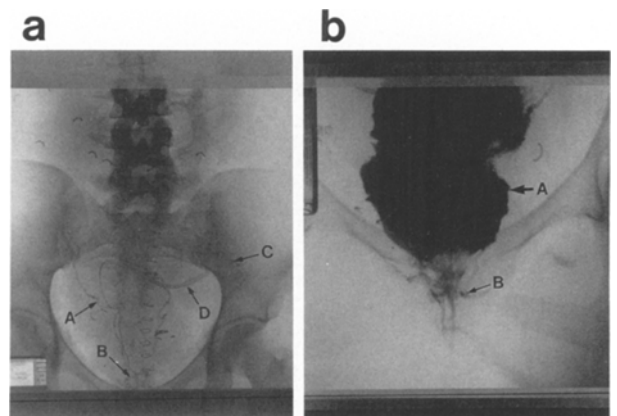
Figure 7. Transanal pouchogram. a. Scout film. b. Pouchography. A. J-pouch. B. Pouch-anal anastomosis. C. Site of bypass tube insertion. D. Radiopaque "stripe" on bypass tube.

completed with multiple interrupted 2-0 polyglycolic acid sutures (Fig. 8c). Management was otherwise identical to that for the patients previously described.

RESULTS

There were no anastomotic complications and no complications related to the intraluminal bypass tube. Significant complications are listed in Table 1. There was no mortality. The intraluminal bypass tube spontaneously dislodged and passed between 18 and 26 days postoperatively. Only the second patient in the series, whose hospitalization was prolonged by multiple complications, was still hospitalized when his Coloshield™ dislodged and passed on the 21st postoperative day.

The ileoanal anastomosis was identified at the dentate line in all patients in the handsewn group. The ileoanal anastomosis was located 1.5-2.5 cm proximal to the dentate line in the stapled group.

Manometric studies were performed in all patients 6 months postoperatively. Bowel movement frequency varied between 2 and 6 (median, 4) during the day and between 0 and 2 (median, 1) at night. Sphincter length varied from 2.0 to 4.5 cm. Resting pressure and maximal squeeze pressure were 50-88 mm Hg and 100-190 mm Hg,

Figure 8. a. Proximal bowel everted into S-pouch. b. Anastomosis of bypass tube to proximal bowel. c. S-pouch-anal anastomosis with bypass tube in place.

respectively. All patients were continent for liquid and solid feces and gas both day and night. Two patients require antidiarrheal medication regularly.

DISCUSSION

Since the concept of ileoanal anastomosis was reintroduced by Parks and Nichols[2] in 1978, restorative proctocolectomy has replaced proctocolectomy and Brooke ileostomy or Kock continent ileostomy as the operation of choice for patients requiring surgical treatment of ulcerative colitis and/or familial polyposis coli.[3, 5-8]

The history of restorative proctocolectomy has been marked by evolutionary change. The long rectal cuff has been largely replaced by one that measures no more than 5-6 cm.[9] Many institutions are now employing a circular, stapled pouch-anal anastomosis instead of the more tedious handsewn anastomosis.[4,10,11] These changes are modifications of details. The fundamental concept of proximal fecal diversion as protection for the newly constructed pouch-anal anastomosis has remained a cornerstone of the procedure in most institutions. Most experts agree that such a temporary proximal diverting ileostomy is an important adjunct to the restorative proctocolectomy. They believe this to be essential if the devastating sequelae of anastomotic leaks and pelvic sepsis are to be avoided.[1,5-9]

Ileostomy may be associated with considerable morbidity after restorative proctocolectomy. Metcalf et al.[1] at the Mayo Clinic reported that 17 percent developed peritonitis followed ileostomy closure. Cohen et al.[5] also reported that 32 percent of 56 patients developed a variety of complications following ileostomy closure. Similarly, Becker and Raymond[7] reported a morbidity of 25 percent in 100 patients undergoing ileostomy closure following ileal pouch-anal anastomosis.
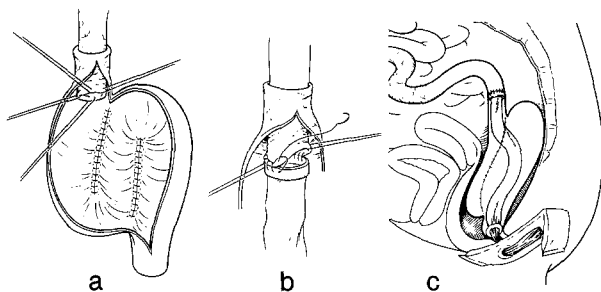
Table 1.
Complications

Patient No.	Early	Late
1	Urinary tract infection	None
2	Pneumonia, septicemia, pulmonary embolus, bleeding gastric ulcer, cytomegalovirus hepatitis	Gastric atony
3	Small bowel obstruction	Pouchitis
4	Prolonged ileus	None

Of course, the greatest liability of temporary ileostomy is the necessity for a second hospitalization and operation for closure. Personal discomfort is considerable for each patient but is difficult to quantify. Financial costs are more easily documented. The cost of this procedure ranges from $10,000 to $15,000. It requires 5–7 days in the hospital, which implies 4–6 weeks of convalescence before unrestricted physical activities and work can be resumed.

Restorative proctocolectomy without ileostomy has been attempted by some in the past. Because of the high incidence of small bowel obstruction at the loop ileostomy site, Goldberg,[9] in a symposium on restorative proctocolectomy, reported attempting single-stage restorative proctocolectomy in six patients. Five of these developed septic complications. Peck[10] reported on a series of 38 patients undergoing stapled ileal pouch-anal anastomosis without ileostomy. Five of these developed septic and/or anastomotic complications. Galandiuk et al.[12] at the Mayo Clinic reported an 11 percent incidence of septic complications in a selected group of 33 patients undergoing ileal pouch-anal anastomosis without diverting ileostomy. Most recently, Matikainen et al.[13] from Finland reported a 96 percent success rate in 25 patients receiving an ileoanal anastomosis without covering ileostomy.

In 1984, Ravo and Ger[14] introduced the concept of the intraluminal bypass tube. Since then, investigators have reported successful use of this device as part of the surgical management of a variety of complex colonic and enteric disease processes[15,16] (unpublished observations).

The present series reports successful use of the intraluminal bypass tube in lieu of proximal diverting ileostomy in seven patients. Initially, the hypothesis was tested in a series of three patients who underwent handsewn S-pouch-anal anastomosis as a second-stage procedure following emergency proctocolectomy for acute ulcerative colitis. Pouch-anal reconstruction was intentionally delayed until patients were no longer receiving steroids in order to prevent the adverse effects of steroids on anastomotic healing and on the ability to fight infection. The ileostomy was removed at the second-stage operation, and the need for proximal decompression was satisfied by the intraluminal bypass tube.

Because of the encouraging results in these pa-

tients, a second group of patients was chosen for single-stage restorative proctocolectomy without ileostomy. Again, the fundamental need for proximal fecal diversion was satisfied by the intraluminal bypass tube. Four (75 percent) of these patients were receiving high-dose steroids at the time of the definitive operation. Morbidity and functional results were essentially identical in the two groups, and morbidity of ileostomy at the time of pouch construction was avoided. In all eight patients, a separate procedure to close the ileostomy was obviated.

Because length of stay is a commonly used endpoint in assessing operative outcome, it should be noted that, when pouch-anal reconstruction has been performed using the intraluminal bypass tube instead of a diverting loop ileostomy, hospitalizations have tended to be slightly longer. Postoperative ileus has been more pronounced, and the return of bowel function has generally not occurred until 7–10 days postoperatively. To improve patient comfort during this period, the last five patients received tube gastrostomies. Bowel function tends to be chaotic when it returns, and several additional days in the hospital are usually required to regulate bowel function. Both the surgeon and the patient must be patient during this period, understanding that the additional time in the hospital is the trade-off for avoiding a second operation.

Nursing management of these patients was less complicated than anticipated. The presence of a perineal appliance was a minor nuisance when compared with the consequences of an ileostomy. Daily changes of the perineal appliance by a competent enterostomal therapist and detailed preoperative discussion of the procedure facilitated patient care.

This small series indicates that the intraluminal bypass tube can successfully be used in selected patients undergoing ileal pouch-anal reconstruction after proctocolectomy for ulcerative colitis and familial polyposis. More investigation with larger numbers of patients will be necessary to further delineate the utility of this technique.

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