

Quality of Life:

The Continent Ileostomy

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Ten patients are presented in whom a continent ileostomy (internal ileal reservoir or Kock Pouch) was constructed. The series is unique in that it includes the first such ileostomy successfully constructed in this country. The other 9 patients, for a variety of reasons, sought conversion from a standard ileostomy with an external appliance, to a continent ileostomy. Eight of 9 were successfully converted. Subsequent loss of continence has occurred in 2 of the patients due to reduction or intussusception of the nipple valve. In one of the two, a satisfactory level of continence appears related to adequate pouch size. The second patient is seriously inconvenienced by a varying level of continence in part related to slow development of pouch size. Seven of the 10 attest to a dramatic improvement in life style, and illustrate the high level of patient satisfaction with a continent ileostomy.

In 1969 Kock described his experience with 5 patients in whom an internal ileal reservoir had been created following total colectomy for ulcerative colitis.⁷ The reservoir created produces a continent ileostomy, eliminates the need for an external appliance, and is serviced by catheterization 2 to 4 times daily. Professor Kock's evaluation of his first 25 patients was published in April of 1971,⁸ and it was this article that stimulated my interest.

FOR MANY YEARS surgeons have been interested in the effects on the experimental animal of recirculating small intestinal loops and reversed or antiperistaltic segments of the small bowel. As early as 1887 Halsted published a study on *Circular Suture of the Intestine*.⁵ The adverse effects of many of these procedures have been recorded in the surgical literature.

Case Reports

Case 1. P. P., a 34-year-old man, had 10 year history of ulcerative colitis and sigmoidoscopic and radiologic progression with development of strictures despite recent weight gain and relative clinical quiescence of the disease.

Total colectomy, abdominoperineal resection and construction of a Type A Kock pouch were performed on 8/25/71. The postoperative course was complicated by transient small bowel obstruction. The patient was discharged on 9/12/71, continent of feces and catheterizing four times daily. Lysis of a single adhesive band was required one month later.

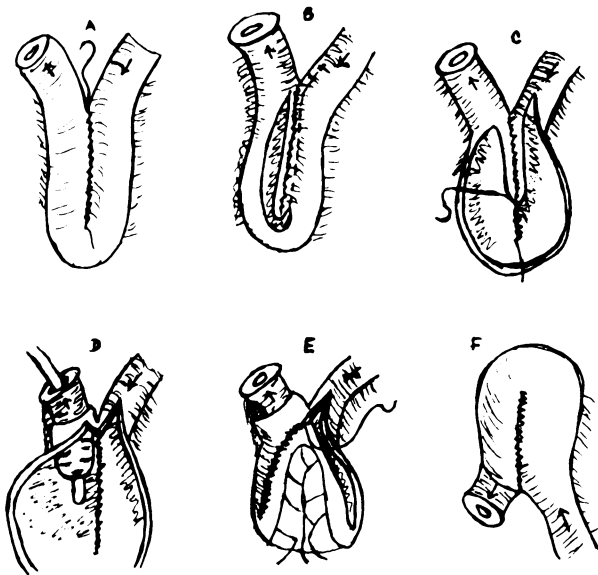
Comment. Forty-two months after construction of the Pouch, the patient catheterizes the Pouch 5-6 times daily. He wears a temporary appliance only when he has severe viral diarrhea. Catheterization requires 2-5 minutes. There have been no evident ill effects. We believe this to be the first successful Kock Pouch constructed in the United States.

Case 2. K. D., a 24-year-old man, had a history of colitis since 1966. In July of 1970 total colectomy and ileostomy were performed elsewhere. Proctectomy had been advised because of persistent rectal disease, and on 6/8/72 abdominoperineal resection and construction of a Type A Kock Pouch were performed at the Stamford Hospital. Absence of any free

In the late 1940's and early 1950's papers appeared describing anal ileostomies with sphincter preservation following colectomy.^{3,11} Because good results were few, and an incontinent perineal ileostomy is impossible to care for, these procedures gained no acceptance. Attempts at sparing the uninvolved rectum in patients undergoing total colectomy for ulcerative colitis are still made, and an occasional successful ileoproctostomy is the rare exception to the usual failure. In 1955 Valienti and Bacon described an ingenious pantaloons pouch for perineal pull-through,¹² but again incontinence precluded wide application of this technique.

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FIG. 1. Construction of Kock pouch.

peritoneal cavity necessitated extensive lysis of adhesions. Marked scarring of the medial rectus obviated a truly oblique course for the ileostomy. The postoperative course was marred by partial obstruction; and recurrent obstruction due to dense adhesions proximal to the pouch necessitated readmission in January of 1973 with major operative intervention and ultimate pouch resection.

Comment. While this patient was never continent, and now is crippled by short bowel syndrome, he can not be considered a true pouch failure but rather a failure due to dense adhesions—complications of his original peritonitis and subsequent surgical intervention.

Case 3. L. D., a 19-year-old woman, underwent total colectomy and abdominoperineal resection for toxic megacolon elsewhere in March 1971. She was unable to retain an appliance intact longer than 36 hours. On 6/21/72 reconstruction to a Type A Kock Pouch was performed. Her course was complicated by ureterolithiasis and a suture line leak with pelvic abscess. She was discharged 8/9/72, 7 weeks after her initial surgery. Following discharge she continued to wear an appliance until full fecal continence was attained 8 months after surgery.

Comment. Like many of the Type A pouches, continence was not achieved until pouch capacity increased. Now, 31 months after surgery, she catheterizes 4-6 times daily depending on diet and wears an appliance only for severe viral diarrhea. She achieves full flatus control by plugging the stoma when she feels this to be socially important.

While each of the successful reservoir patients were delighted with their improvement in life style, it was apparent that full continence with the Type A pouch was lacking in both instances. Dr. Kock now discovered that failures of a Type C pouch, which relied on a valve constructed by intussuscepting a nipple of the efferent limb, had occurred because of reduction of the nipple. He then revised the procedure and 32 additional cases have achieved immediate and total and sustained continence.

The revised Type C pouch is constructed as follows. Slightly more than 10 cm of terminal ileum is left untouched. Two 15 cm legs are sutured at the antimesenteric border with continuous triple O chromic to form a "U." The antimesenteric border is opened with an extension of 3 cm on the afferent limb to separate inlet from outlet of the reservoir. The mucosa is oversewn with continuous catgut. After deep scarification of the serosa of the more proximal 7 cm of the efferent limb, this area is intussuscepted to form a 3-4 cm nipple. The intestine is fixed with 6-12 sutures of non-absorbable suture over a #28 catheter used as a strut. The base of the "U" is brought to the apex of the inlet and the reservoir closed with two layers of continuous catgut. The reservoir is inverted between the leaves of the mesentery and valve function tested by catheterizing the outlet, injecting air with the afferent limb occluded, and removing the catheter. Following deflation by again inserting the catheter, a low ileostomy opening is made and a canal made through the rectus muscle in a medial and caudal direction. The efferent limb is drawn through the canal and the pouch carefully secured circumferentially with interrupted non-absorbable sutures to the anterior peritoneum. The lateral space is closed and a flush (½-1 cm) ileostomy matured with interrupted catgut. Introduction and retention of a #28 plastic catheter to ensure ease of catheterization is vital. The catheter is then left in place in the reservoir and attached to drainage for 7 days, after which time intermittent catheterization by the patient is begun.

Case 4. M. D., a 27-year-old woman, underwent total colectomy for ulcerative colitis in April 1972. Since colectomy she had had arthritic problems related to active disease in the retained rectal segment. She desired conversion because of stoma and appliance problems as well as deep emotional concern over the appliance. On 2/7/73 abdominoperineal resection and construction of a Type C Kock Pouch was performed. She was discharged on 2/25/73 totally continent and catheterizing twice daily.

Case 5. T. P., a 26-year-old man, underwent total colectomy in 1969 for ulcerative colitis. Active disease was present in the retained rectum. For a variety of reasons related to occupation and life style, wearing an ileostomy appliance was difficult and impossible. On 7/9/73 abdominoperineal resection and construction of a Type C Kock Pouch was performed. He was discharged on 7/20/73 catheterizing 2-4 times daily and totally continent between catheterizations.

Case 6. M. M., a 28-year-old woman, underwent total colectomy for toxic megacolon in December of 1968. An abdominoperineal resection was necessary on 12/31/68 because of massive hemorrhage. Repair of a small bowel fistula was achieved on 2/7/69. Severe limitations in her life style and aversion toward appliances led to desire for conversion, and on 1/4/74 resection of a large multiloculated left ovarian cyst, cholecystectomy, and construction of a Type C Kock pouch were performed. Partial small bowel obstruction relented on 1/19/74 and she was discharged on 1/26/74 catheterizing 4-5 times daily and totally continent between catheterizations.

Case 7. J. C., a 29-year-old woman, had a total colectomy

and abdominoperineal resection for ulcerative colitis on 10/29/70 elsewhere. Because of inability to retain an appliance longer than 48 to 72 hours, and social and psychological problems attributable to the appliance, she sought conversion to an internal ileal reservoir. On 6/3/74 the ileostomy was revised and a Type C Kock Pouch was constructed. She was discharged on 6/15/74 catheterizing every 4-6 hours and totally continent between catheterizations.

Case 8. C. M., a 33-year-old man, had a total colectomy and abdominoperineal resection for ulcerative colitis in November of 1973. Despite ostomy therapist consultation, he was unable to retain an appliance longer than 48 hours. There were severe limitations on his desired level of physical activity (contact sports) and he desired conversion to a continent ileostomy. On 6/20/74 lysis of adhesions and revision of the ileostomy to a Type C Kock pouch was performed. On 6/28/74, one day after initiation of intermittent pouch catheterization, a low spiking temperature began. Incision and drainage of an intraperitoneal abscess was performed on 7/5/74 with the appearance of small bowel content on 7/6/74. Retrograde gastrografen study on 7/8/74 confirmed the presence of a leak from the pouch suture lines. Maintenance with constant pouch catheterization and initial IV feedings led to cessation of the leak by 7/11/74 and oral Vivonex was then begun with progressive healing over the next 8 days. He was discharged on 7/20/74, catheterizing every two hours during the day and totally continent between catheterizations. By 8/13/74 he was catheterizing 3-4 times daily. Four months after surgery he suddenly became intermittently incontinent. Colonoscopy of the pouch and small bowel studies revealed a small pouch, absence of the nipple sutures and presumptive evidence that the valve was intususcepting. Because of the flush stoma control of leakage has been a major problem.

Comment. We are deferring attempts at operative correction in hopes that pouch size increase may lead to satisfactory control.

Case 9. R. F., a 49-year-old man, had a total colectomy and abdominoperineal resection on 1/29/58 for ulcerative colitis. He had been well since his surgery and was well adjusted to his appliance, but now required stomal revision because of retraction of the upper medial lip of the stoma and consequent appliance leaks. Despite my recommendation that simple stomal revision be performed, he desired conversion to a continent ileostomy and on 6/24/74 conversion to a Type C Kock pouch was performed. At this time resection of the terminal 30 cm of ileum was necessitated by what appeared to be Crohn's Disease but on microscopic was interpreted as ulcerative ileitis (mucosal involvement). Initial high output with electrolyte depletion finally stabilized, and he was discharged on 7/17/74 catheterizing as necessary (usually twice in the morning and at shorter intervals during the afternoon and evening). Four months after surgery minor episodes of incontinence occurred. Colonoscopy of the pouch and proximal ileum with biopsy and small bowel x-rays established a diagnosis of Crohn's Disease. Despite probable valve intususception, presence of a large pouch has provided a satisfactory level of continence.

Comment. The presence of progressive enteritis precludes any optimism about the ultimate outlook for this patient. Surgical intervention with sacrifice of the pouch and additional small bowel will probably be required.

Case 10. L. R., a 40-year-old woman, had completion of a staged total colectomy in 1964. Clinically her disease process appeared to be segmental colitis but microscopically was read as mucosal disease. Because of uncontrolled skin and appliance problems, she sought conversion to a continent ileostomy and on

7/9/74 lysis of adhesions, right tubal ligation and conversion to a Type C Kock Pouch was performed. She was discharged on 7/21/74 after an uneventful postoperative course, to be readmitted three days later with complete small bowel obstruction. This did not relent on Miller-Abbott tube suction and on 7/29/74 extensive lysis of adhesions and Baker tube jejunostomy were necessary. The postoperative course was complicated by wound infection and pulmonary emboli responding to open drainage and Garamycin and IV Heparin respectively. She was discharged on 8/31/74 on Coumadin maintenance catheterizing 4 times daily.

Results

Of three Type A reservoirs, two have a satisfactory level of continence albeit without full continence of flatus. One patient is a total failure due to adhesions.

Of 7 Type C reservoirs, 5 are fully continent and have been since surgery. Two other Type C patients have become incontinent 4 months following their surgery.

The initial total continence of all Type C patients is consistent with Dr. Kock's experience with 37 such reservoirs.⁹ Earlier series reported from the United States^{1,2} indicate a significant percentage of patients wearing appliances immediately following surgery.

Discussion

At present the contraindications to primary construction of the internal reservoir are considered to be: high dosage maintenance steroid therapy; granulomatous colitis; and major emergency intervention in an acutely ill patient for hemorrhage, sepsis, or toxic megacolon. A relative contraindication is the presence of multiple adhesions since our most common postoperative complication has been small bowel obstruction (3 of 10 patients).

The difficulty distinguishing Crohn's Disease from ulcerative colitis is of deep concern. A number of unreported cases have required resection of the pouch because of Crohn's disease of the small bowel.

As a result of episodes of obstruction related to peanuts, sesame seeds, and kernel corn, we now recommend that these patients irrigate their pouches weekly with tap water until clear.

There are three major questions which this concept of an internal ileal reservoir poses. The first of these—Does it work? cannot be adequately answered at this time. Seventy per cent of this series are continent but communication with Dr. Kock reveals that several of his Type C reservoir patients have developed late incontinence. He has modified the formation of the nipple by offsetting the mesentery to allow more complete suture placement. Dr. Gelernt in New York has experienced a similar problem and is using additional rows of seromuscular sutures of the nipple wall.

The second question—Is it safe?—logically breaks down to two phases, the operative and the long term postoperative. The procedure does possess major opera-

tive risk elements—the suture lines are extremely long and we have had two pouch suture line leaks in these 10 patients. With experience it is probably as safe as most other major operative procedures. The long term effects are not quite as clear. Dr. Kock's initial group of patients are now 7 years since their surgery and are uniformly doing well. My first patient is now more than three years postoperative and is without evident problems. A good deal of experimental work by Dr. Kock^{4,6,10} would appear to substantiate an absence of deleterious effects on absorption. Presently, I still regard the procedure as experimental and will continue to do so until we have a significant number of patients doing well after 15 to 20 years with a continent ileostomy.

The final question—Why do it at all?—really refers to what everyone associated with health care must accept as a major concern—the Quality of Life. The answer must come from the patients—5 in this series—who have lived with a conventional ileostomy, and now have a continent ileostomy. It appears that if you are young and physically and socially active, a conventional ileostomy may not be quite your bag.

Conclusion

While advances in the medical and surgical treatment of ulcerative colitis have brought significant improvement in our ability to sustain patients, emergency colectomy all too frequently must be employed on desperately ill patients. Under these circumstances colectomy results in an heightened morbidity and mortality.

The reservoir procedure herein described, in most in-

stances, produces a continent ileostomy. Elimination of the need for an external appliance results in a more normal life style, and should encourage earlier operative intervention in patients with ulcerative colitis with a concomitant reduction in morbidity and mortality.

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