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Conversion of Failed Ileal Pouch-Anal Anastomosis to Continent Ileostomy

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PURPOSE: We report the results of converting 42 failed ileal pouch-anal anastomoses to a continent ileostomy (using the Barnett modification of the Kock pouch) performed in the course of 1,334 consecutive continent ostomy procedures. METHOD: Results were obtained from a data registry that tracks long-term outcomes of consecutive continent ostomy procedures performed by 12 surgeons in five centers in the United States. RESULTS: Forty of the 42 patients with failed ileal pouch-anal anastomoses have a functioning continent ostomy. Two patients have had pouch excision. Quality of life for the patients with ileal pouch-anal anastomoses as measured by the SF-36 index improved postoperatively. Long-term outcomes for the patients with ileal pouch-anal anastomoses were similar to those for the larger population of patients who underwent the continent ostomy procedure for other reasons. CONCLUSION: Conversion of a failed ileal pouch-anal anastomosis to a continent ileostomy is a satisfactory alternative to the Brooke ileostomy in appropriate cases. [Key words: Failed ileoanal pouch; Continent ileostomy; Ileal pouch-anal anastomosis; Restorative proctocolectomy]

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During the past decade, the ileal pouch-anal anastomosis (IPAA) has become the most frequently used procedure for managing patients who require total colectomy. The operation is performed most often for ulcerative colitis or familial adenomatous polyposis. The IPAA eliminates the need for an external appliance to control fecal effluent (as required by the Brooke ileostomy) while maintaining normal anal routes of defecation. The IPAA, however, is not suitable for some patients for technical or other reasons, and a significant number of patients experience failure of the IPAA pouch (5 to 15 percent in various reports).[1–4]

This article reports the experience of five United States centers involving 12 surgeons who use the Barnett modification of the Kock pouch to take the place of failed IPAAs. The Barnett technique has been described in previous publications.[5] The procedure uses a collar of ileum, continuous with the pouch, wrapped around the access segment at the base of the valve, and an isoperistaltic access segment, both intended to reduce valve slippage.

We assessed the effectiveness of the continent ileostomy in patients with failed IPAAs. We also compared the postoperative experience of these patients with failed IPAAs with the larger universe of patients who underwent the continent ileostomy for other reasons. This latter group included patients with Brooke ileostomies, failed Kock pouches, and those who underwent primary proctocolectomies.

PATIENTS AND METHODS

The five collaborating centers have all reported consecutive cases to a centralized database since 1988. Questionnaires used for the database tracked clinical and quality-of-life outcomes data. The primary instrument used to track quality-of-life changes was the SF-36, which has emerged as a generally accepted quality-of-life evaluation instrument. The SF-36 uses eight scales that separately measure patient self-assessment of general health status, physical functioning, role limitations from physical health problems (Role Physical), role limitations from emotional problems (Role Emotional), bodily pain, social functioning, vitality, and mental health. The reliability, validity, and conceptual development of the SF-36 have been documented extensively.[6–9]

At the time of initial surgery, patients were informed of the ongoing data registry and were told that they would be contacted periodically for several years to obtain postoperative clinical data. An administrative system has been put in place to assure that postsurgery patient history is maintained and kept current. All patients in this patient registry were routinely mailed follow-up questionnaires annually for a minimum of five years after surgery. Efforts were made to locate patients who did not complete these mailed questionnaires using an escalating series of interventions including repeat mailings, home telephone calls, and the use of private investigating agencies to locate patients who may have moved.

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We identified all patients in the database for the period between January 1, 1989, and December 31, 1996. The 1989 start date was selected because IPAA revisions were begun after that date. We separated the study population into two groups: those undergoing the continent ostomy procedure to replace a failed IPAA and a much larger population undergoing a continent ostomy for other reasons. The overall response rate for our follow-up activities was 89.7 percent for the general continent ileostomy population and 95.2 percent for the failed IPAA population. The average interval between initial operation and receipt of the last follow-up questionnaire was 3.6 years for the patients with failed IPAAs, and 3.4 years for the general continent ileostomy populations. The differences were not statistically significant.

We began capturing SF-36 data preoperatively and postoperatively in July 1991. Accordingly, the subpopulation of patients for whom SF-36 data is available is smaller than the total patient population under study.

Eighty-three of the patients from the total patient population were diagnosed preoperatively with Crohn's disease. Two of the patients with failed IPAAs were diagnosed preoperatively with Crohn's disease. An additional 17 patients from the general population were diagnosed with Crohn's disease postoperatively, and 1 patient with failed IPAA was diagnosed postoperatively. We are currently preparing a separate report that analyzes the postoperative experiences of the patients with Crohn's disease.

The primary reason for conversions to continent ileostomy in all cases was incontinence, with associated skin excoriation, pain, and frequent bowel movements. Two patients also reported stenosis, and one had a pouch vaginal fistula.

RESULTS

A total of 42 patients undergoing the continent ileostomy procedure after a failed IPAA were identified. The total patient population undergoing this procedure during the simultaneous period for other reasons consisted of 1,334 patients. In four of the original patients with IPAA, the original pouch was retained and used to construct the new continent ileostomy; the operating surgeon constructed a new valve, access segment, and collar. In 38 of the patients with IPAA, a new pouch was constructed.

Table 1 provides selected demographic data for the two patient populations. The patients with failed IPAAs were more likely to be female and younger than the general continent ileostomy population, although the differences were not statistically significant by unpaired *t* test. Ninety patients (6.7 percent) of the general continent ileostomy population were known or subsequently found to have Crohn's disease. The corresponding number for the failed IPAA population was 3 (7.1 percent).

Table 1.
Demographics

	General Population	Failed IPAA Population
Number of male patients	604 (45)	16 (38)
Mean age (yr)	41.9	34.3
Number of female patients	730 (55)	26 (62)
Mean age (yr)	40.2	37.4
Preoperative diagnosis of Crohn's disease	83 (6.2)	2 (4.8)
Postoperative diagnosis of Crohn's disease	7 (0.5)	1 (2.4)

IPAA = ileal pouch-anal anastomosis.
Figures in parentheses are percentages.

For the period studied, the distribution of indications among the general continent ileostomy population was 1,038 (77.8 percent) conversions from an initial Brooke ileostomy (BI), 62 (4.6 percent) conversions after failure of a Kock pouch, and 192 (14.4 percent) patients who underwent the continent ileostomy as the primary procedure with simultaneous total proctocolectomy.

Table 2 shows pouch success rates for the two populations. Forty (95.2 percent) patients of the failed IPAA population reported fully functioning pouches. Two were excised, one after development of a pouch vesical fistula, the other after emergence of Crohn's disease, which had not been diagnosed at the time of the original colectomy. One thousand one hundred eighty-four (88.7 percent) patients of the general population reported fully functioning pouches. One patient with failed IPAA died months after the operation of unrelated causes with a functioning pouch. Twenty-five (1.9 percent) patients of the general population died during the postoperative follow-up, all >90 days postoperatively. Pouch status at the time of death could not be determined reliably for this patient subset.

Table 3 contrasts the complications (both medical and surgical) experienced by the patients with failed IPAAs with those experienced by the general continent ileostomy population. The patients with failed IPAAs experienced readmissions more frequently

Table 2.
Postoperative Pouch Status

Pouch Status	Failed IPAA Patient Pouch Status		General Population	
	No. of Patients	%	No. of Patients	%
Fully functioning	40	92.9	1,184	88.7
Pouch excised	2	4.7	116	8.7
Intact pouch with temporary ileostomies awaiting closure	0		9	.7
Deceased	1	2.4	25	1.9

Table 3.
Postoperative Readmission Rates

	Former IPAA (N = 42)		General Population (N = 1334)	
Patients readmitted	19 (45)		536 (40)	
Mean readmissions		2.3		2.2
Medical readmissions	18 (43)		300 (22)	
Mean medical readmission rate		2.3		1.7
Surgical readmissions	14 (33)		403 (30)	
Mean surgical readmission rate		1.7		1.7

Figures in parentheses are percentages.

Table 4.
Readmissions for Surgical Procedures in Patients After Conversion of Failed IPAA

Complications	
Major	
Slipped valve	4 (9.5)
Fistula	4 (9.5)
Bowel obstruction	1 (2.4)
Pouch removal	2 (4.8)
Laparotomy for strictures	1 (2.4)
Minor	
Hernia repair	1 (2.4)
Stoma revision	5 (11.9)

Figures are number of readmissions and (percentage).

Table 5.
Patient's Response to Quality-of-Life Question "Life after the continent ileostomy is . . ."

Response	Former IPAA		General Population	
	No.	Percent	No.	Percent
Much better	34	85.0	810	75.8
Better	6	15.0	173	16.2
Same	—	0.0	33	3.1
Worse	—	0.0	29	2.7
Much worse	—	0.0	23	2.2
Total	40		1,068	

(45 *vs.* 40 percent) than did the patients without IPAAs. For patients readmitted once, no statistically significant differences in the mean number of readmissions for the two patient population subsets were noted (2.3 *vs.* 2.2 readmissions). The patients with failed IPAAs experienced more medical complications than did the general continent ileostomy population (43 *vs.* 22 percent) and experienced a higher mean number of readmissions for medical reasons (2.3 *vs.* 1.7 readmissions). Both differences were statistically significant. In both subsets, however, the leading reasons for medical readmissions were similar and included medical treatment of pouchitis, small-bowel obstruction, and pouch fistula. Patients were considered to have pouchitis on the basis of the appearance of symptoms, such as loose effluent and cramping, which responded to antibiotic treatment. Eleven (26 percent) of our patients with failed IPAAs experienced symptoms of pouchitis, of which 3 (7 percent) experienced symptoms severe enough to warrant hospitalization. The percentage of patients admitted for surgical reasons and the average number of surgical readmissions for the two populations were similar.

Table 4 provides a frequency distribution for the patients who required follow-up surgery, aggregated by the type of surgery required. Major complications included pouch failure leading to excision, valve slippage, and fistula formation involving either the valve or the pouch. Minor complications included stoma revisions and hernia repairs, usually accomplished as an outpatient.

Table 5 shows that 40 (100 percent) of the patients with failed IPAAs who retained their pouch rated their life after the continent ileostomy as better or much better than before. This compares with 983 (92 percent) patients of the general continent ileostomy population who rated their lives after surgery as better or much better than previously.

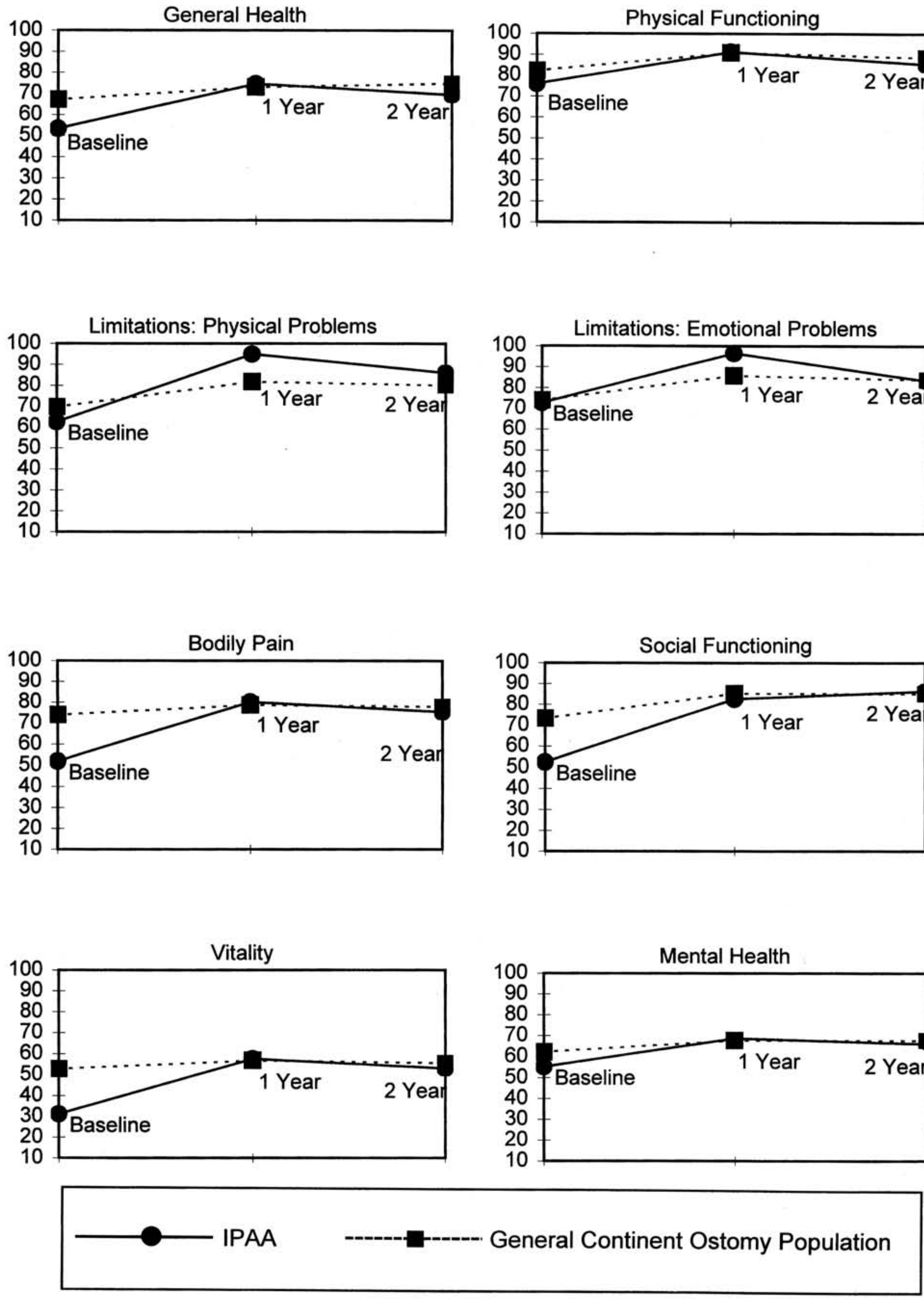

Figure 1. Quality-of-life changes measured by SF-36. IPAA = ileal pouch-anal anastomosis.

Figure 1 shows preprocedure and postprocedure quality-of-life indices measured by the SF-36 instrument. For nearly every measure, the results were similar: the patients with failed IPAAs began the study sicker than the general continent ileostomy population. Within two years, the patients with failed IPAAs became either identical or superior to the general continent ileostomy population on each quality-of-life indicator. The patients with failed IPAAs preoperatively showed lower SF-36 scores than did the general continent ileostomy population but improved faster.

DISCUSSION

Based on our case review, we conclude that the continent ileostomy can be used as an effective treatment for patients when a primary IPAA procedure fails. This is consistent with results reported by previous authors. Hulten *et al.*[10] reported five failed IPAAs successfully converted to a Kock continent ileostomy. (One of the reported cases had a pouch removal within one year because of valve slippage.) Ecker *et al.*[11] reported five conversions of failed IPAAs (of which only one failed and was converted to a Brooke ileostomy). Kortmann and Hoitsma[12] reported good results in seven cases converted to continent ileostomy from IPAA with high patient satisfaction after five-year follow-up. Both Hulten[13] and Vernava and Goldberg[14] concluded that the continent ileostomy procedure should be considered for patients who were not candidates for an IPAA procedure and for those whose IPAA had failed.

This case series is unique in the high number of cases reported, approximately six times the number of cases reported by any previous author. Our experience using the continent ostomy as a replacement for failed IPAAs showed the following with an average of 3.39 years' follow-up:

1. The patients with failed IPAAs experienced very low levels of pouch failure rates.
2. The patients with failed IPAAs after operation greatly improved their quality of life as measured by SF-36 scores.
3. Postoperatively, the patients with failed IPAAs experienced similar rates of postoperative complications but had more frequent readmissions for medical complications than did those patients undergoing continent ileostomy for other reasons, including conversion of Brooke ileostomy and Kock pouches.

The procedure requires surgeons who are experienced in the technique and a commitment to provide support services for an extended postoperative period.

CONCLUSION

The continent ileostomy offers an alternative, with a high degree of patient satisfaction, to those patients who face the loss of an IPAA.

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Invited Editorial

To the Editor—It is incumbent on surgeons to review critically and publish their experience. This allows assessment of results, widespread peer review, and advancement of knowledge. The authors are commended for their presentation. Several aspects, however, deserve additional discussion.

The Barnett modification of a Kock pouch uses the afferent limb of small bowel to construct the nipple valve and wraps a portion of the residual efferent limb around the nipple valve. This is supposed to serve as an inflatable collar similar to that used in a gastric fundoplication. The Barnett pouch is more complicated than the three-limb S-pouch described by McLeod and Fazio.[1] The more recent modification, which involves stapling the nipple valve to the side wall of the pouch, seems to have significantly reduced the problem of valve slippage.[2] These different types of continent ileostomy pouches have not been compared in a controlled fashion. Thus, although presenting a large series of patients with reasonable outcomes, we have no evidence that this modification of the continent ileostomy is any better than the standard procedure most centers are using. Despite many modifications and increased experience, as shown in Tables 2 through 4, this operation maintains a significant morbidity. In addition, no information was provided on the length of hospitalization or cost associated with the conversion surgery.

In only 4 of the 42 patients described in this manuscript was the old anal pouch maintained and used to construct the new continent ileostomy. The remaining 38 patients had a totally new continent ileostomy created. Although the experience is smaller, one of the us (DEB) has been able to use the old ileal pouch in five patients who were converted to a continent ileostomy for a failed ileoanal pouch. This preserves intestine and has the advantage of a partially mature reservoir being used to potentially shorten the time for accommodation after pouch construction.

The stated reason for conversion to continent ileostomy was incontinence, with associated skin excoriation, pain, and frequent bowel movements. Two patients had stenosis and one had a pouch vaginal fistula. No information is presented on medical or surgical attempts used to improve the patients' symptoms. One wonders whether some of the anal pouches might have been salvaged with aggressive medical management, sphincter evaluation, and possibly biofeedback. Several reports have described reasonable results with ileal pouch salvage *via* surgical techniques.[3–5]

The authors last published a portion of their results in 1995.[6] That report described 510 patients operated on from 1988 to 1991. The total patient population referred to in the current article is 1,376 patients operated on from 1989 to 1996. One hundred ninety-two (14.4%) of these underwent the continent ileostomy as the primary procedure with simultaneous proctocolectomy. This appears to be an excessively large number of patients receiving continent ileostomies when "the ileal pouch-anal anastomosis (IPAA) has become the most frequently used procedure for managing patients who require total colectomy" (Behrens, *et al.*, present study). One wonders how many IPAAs were performed by the authors during the study period, and if the authors do not perform IPAAs, whether the patients truly received an unbiased presentation of their surgical alternatives. Also, did patient solicitation by members of this collaborative group play a role?

The authors' quality-of-life determinations compared patients before and after their conversion procedure. No comparison was performed with patients who had their failed IPAA converted to a Brooke ileostomy. Such a comparison would give the reader a better perspective on the potential life-style advantages of a continent ileostomy over a conventional ileostomy.

The authors' 1995 article excluded patients with Crohn's colitis, and the current report states that a separate review of these patients is forthcoming. The editors and readers eagerly await this data. The point that must be emphasized again is that patients with Crohn's disease are currently not candidates for the continent ileostomy or pelvic pouch procedures. Because these authors have a large experience with continent ileostomies in patients with Crohn's disease, it will be very important to see both the short-term and long-term results in this group.

The authors' article documents that conversion to a continent ileostomy is an option for patients with a failed ileoanal pouch. However, patients must be aware of the potential advantages and disadvantages (including morbidity) with continent ileostomies, the options to correct the IPAA, and their potential good function and quality of life with a Brooke ileostomy.

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LETTERS TO THE EDITOR

The Authors Reply

To the Editor—Drs. Beck and Fleshman observe that our article,[1] "although presenting a large series of patients with reasonable outcomes," offers "no evidence that this modification of the continent ileostomy is any better than the standard procedure. . . . " This misreads the purpose of our paper. We did not intend to compare the outcomes of the two pouch procedures. We narrowly focused on whether the continent ileostomy can be offered as an option to patients who fail the ileal pouch-anal anastomosis (IPAA). We believe that our 40 successful outcomes out of 42 patients amply support the conclusion that the subset of failed IPAA patients should be offered the option of an alternative pouch procedure should they wish to avoid use of an external appliance.

Regarding attempts to repair the failed pouch, none of the original IPAAs were done by our group. We saw these patients after their original surgeons had declined to do further surgery or the patients refused further perineal surgery. A common complaint of patients was that they had been carried too long with an unsatisfactory situation that would not improve. Their primary surgeons did not refer the patients to us and it was their decision to seek other means.

The question of salvage of the old pouch for use in a continent ostomy is not settled. Dr. Beck is to be commended that he was able to salvage five of five pouches. We have found that in some cases the old pouch sustained too much damage from inflammation or scarring to be used.

We agree that it would be valuable to compare the quality of life of patients with failed IPAAs who receive Brooke ileostomies with those who receive the continent ileostomy. We were unable to do so because we rarely convert to the Brooke in such circumstances.

We believe it fair to observe, however, that our previous publication detailed the experience of a very large number of patients who were converted from the Brooke ileostomy and who overwhelmingly concluded that their quality of life had improved as a result.

Much of the editorial comment dealt with the paper by Mullen *et al.*[2] published in 1995. Drs. Beck and Fleshman question whether our patients receive unbiased presentation of surgical alternatives. They suggest that the 14.4 percent incidence of primary continent ostomies in the series of 1,376 continent ostomy patients is excessive. This is a misconception. The 14 percent rate does not represent the number of continent ostomy cases done in a series of total colectomies in whom an IPAA, continent ostomy, or Brooke ileostomy could be considered. Eighty-five percent of the cases reported were conversions from existing Brooke ileostomies or failed IPAAs.

No primary IPAAs were performed in the series of 1,376 patients. This is not surprising, because our group of surgeons generally do not perform this procedure.

Nevertheless, it is our policy (especially when contemplating a primary continent ileostomy) to inform patients quite thoroughly about the IPAA procedure. We strongly urge patients to consult with surgeons who perform the IPAA and almost all our patients do so.

One of us (MP) is currently in the process of using meta-analytic techniques to survey the extant surgical literature dealing with the various surgical approaches to ileostomy. It is our hope that this report (when completed) will more directly provide evidence concerning the comparative benefits of the various surgical approaches to inflammatory bowel disease that the editorial writers request.

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