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Short Communication

Fecal incontinence after ileal pouch-anal anastomosis in patients with ulcerative colitis

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Abstract

Objective: Total proctocolectomy with ileal pouch-anal anastomosis (IPAA) has become the restorative procedure of choice for medically refractory ulcerative colitis (UC). In patients who undergo proctocolectomy with IPAA, fecal continence outcomes are an issue. The present study evaluated fecal incontinence in patients who underwent IPAA for UC.

Methods: This was a case series study. We reviewed the clinical records of all patients who had undergone a proctocolectomy with IPAA for UC at the Colorectal Department of Shiraz University of Medical Sciences, Iran, between January 2010 and December 2022. Each patient completed a Cleveland Clinic Florida Fecal Incontinence Scoring System (CCFFIS) questionnaire to evaluate fecal incontinence one year after the closure of the colostomy. Data analysis was conducted utilizing various statistical measures such as mean, count (percentage), chi-square, and one-way ANOVA tests. The entire analysis was performed using SPSS 26 software. *P* values less than 0.05 were deemed statistically significant.

Results: From January 2010 to December 2022, 159 patients who underwent IPAA surgery were included in the study. Of these patients, 108 (67.9%) had no complaint about fecal incontinence (score 0). The median CCFFIS score was 2.19, and there were no significant differences between gender, age, technique, and number of procedures regarding fecal incontinence (*P* values 0.475, 0.125, 0.319, and 0.376, respectively).

Conclusion: This study confirmed that total proctocolectomy with IPAA is a complex surgery that could have good functional results if patients are selected carefully and an experienced surgeon performs the procedure.

Keywords: Ulcerative colitis, Ileal pouch-anal anastomosis, Fecal incontinence

Introduction

Ulcerative colitis, an inflammatory bowel disease that affects the colonic mucosa, is a chronic condition characterized by periods of quiescence and activity (1,2). Despite the significant advancements in medical treatments, a considerable percentage of ulcerative colitis (UC) patients, ranging from 15% to 25%, still require surgical intervention. In cases of medication complications, dysplasia or cancer, and medically refractory UC, total proctocolectomy with ileal pouch-anal anastomosis (IPAA) has emerged as the preferred restorative procedure (3). The procedure is performed as a one-, two-, or three-stage process depending on the patient's risk profile. Generally, the two-stage procedure with a protective ileostomy is the most common variation. A three-stage procedure is carried out in emergencies where patients have significantly reduced general health conditions or rely on high doses of immunosuppressive therapy. The initial step involves subtotal colectomy and terminal ileostomy with the formation of a Hartmann pouch. In the second stage, once the patient's condition has stabilized, the remaining part of the proctectomy is performed along with the IPAA and a protective ileostomy. The loop ileostomy is subsequently removed in the third step (4,5).

Several studies have demonstrated the feasibility and safety of laparoscopic total proctocolectomy. Recent reports have also indicated a reduction in major and minor complications, intraoperative blood loss, and length of hospital stay (6,7). The functional outcomes for most patients are satisfactory, with early and late complication rates ranging from 26% to 33% and 29% to 63%, respectively (2).

Fecal incontinence, which refers to the involuntary loss of liquid or solid stool, is a debilitating condition that significantly impacts a patient's quality of life (8). Although not life-threatening, it is highly distressing and often disabling. Many individuals feel too ashamed to discuss

this symptom with their healthcare provider. Incontinence can arise from intestinal diseases that cause inflammation or reduce the capacity of the rectum or neorectum, as well as from a faulty anal sphincter mechanism. In patients who have undergone IPAA, both of these factors may be present and contribute to incontinence. Various scoring systems have been developed to evaluate these patients, including the Cleveland Clinic Florida Fecal Incontinence Scoring System (CCFFIS), a validated and user-friendly tool (9,10).

For patients who undergo proctocolectomy with IPAA, fecal continence outcomes are a matter of concern. It appears that individuals with UC experience an improved quality of life following restorative proctocolectomy. However, limited research exists on the quality of life and functional outcomes of IPAA patients (8,11).

The present study aimed to assess fecal incontinence in patients who underwent IPAA for UC and to investigate the impact of the surgical technique and number of operations on fecal continence after IPAA in a specialized center for colon and rectal diseases in Shiraz, Iran.

Methods

This study was a case series study, reviewed and approved by the ethics committee of Shiraz University of Medical Sciences (ethical code: IR. SUMS.REC.1400.251). Moreover, informed written consent was obtained from all participants.

Using the census sampling method, we reviewed the clinical records of all patients who had undergone proctocolectomy with IPAA for UC at the colorectal department of Shiraz University of Medical Sciences, Iran, between January 2010 and December 2022. The patient exclusion criteria were the diagnosis of Crohn's disease, indeterminate colitis on postoperative pathology, surgical indication of malignancy, and ileo-rectal anastomosis. From January 2010 to December 2022, 192 patients with UC underwent IPAA in the studied institution. Considering the exclusion criteria, 11 patients were excluded from the study, and 22 did not cooperate in completing the questionnaire. Finally, 159 patients were included in the study for final evaluation.

Each patient was invited to complete a survey one year following ileostomy reversal. The validated CCFFIS questionnaire was sent to these patients (Table 1). The scoring system comprises five elements: solid, liquid, gas, pad usage, and lifestyle alteration. These elements are associated with five different frequencies, namely never, rarely, sometimes, usually, and always, which are assigned the numerical values of 0, 1, 2, 3, and 4, respectively. Thus, the total score can range from 0, indicating full continence, to 20, indicating complete incontinence. The CCFFIS includes pad usage and lifestyle alteration and assigns equal weight to all five elements. It is worth noting that CCFFIS is highly regarded for its ease of comprehension and its correlation with patient's perception of symptoms. As a result, this instrument has received significant attention and recognition in the literature (9,10).

Table 1. Cleveland Clinic Florida-Fecal Incontinence Score (CCF-FIS)

Type of incontinence	Frequency				
	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wear pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Never: 0; rarely: < 1/month; sometimes: < 1/week; ≥ 1/month; usually: < 1/day; ≥ 1/week; always: > 1/day. Minimum score: 0 (perfect continence); maximum score: 20 (complete incontinence).

A separate checklist was used to collect demographic information, including age, sex, type of operation, number of surgeries, etc.

The variables were summarized as mean or count (percentage) as appropriate. We analyzed the collected data using descriptive statistics (chi-square test and one-way ANOVA). All statistical analyses were performed using SPSS software version 26, and P values < 0.05 were considered statistically significant.

Results

From January 2010 to December 2022, 192 patients with UC underwent IPAA in our institution. They had operations for intractable disease despite optimized medical therapy, dysplasia or carcinoma, toxic megacolon, or colonic perforation.

Among the patients with IPAA, those with cancer diagnoses and postoperative pathology with a risk of Crohn's disease, postoperative complications, and permanent ostomy were excluded. Three of the patients passed away, and one had a car accident with a complete spinal cord injury, so they were excluded from the survey. Also, 22 patients did not respond to the questionnaire. Finally, 159 patients, 87 (54.7%) women and 72 (45.3%) men, were definitively included in our study.

The mean age of the patients at the time of IPAA was 36.81 (range 13–68) years. Most patients were between 36 and 54 years old. The mean age was 37.14 for men and 36.54 for women, and there was no significant difference between the two groups (P value = 0.317).

An experienced surgeon performed all operations in the Colorectal Surgery Department of Faghihi Hospital, Shiraz, Iran, a tertiary referral center in south Iran. In all cases, a 15 cm J-pouch was made with a linear stapler, and Ileal anastomosis was done with a circular stapler No. 29 or 31. Total proctocolectomy and IPAA were done laparoscopically in 134 cases (84.3%) and with open surgery due to emergency or adhesion in 15 (9.4%) cases. In 10 (6.3%) cases, the operation was started laparoscopically but was converted to open surgery because

of adhesions or the anesthesiologist's recommendation. For 118 patients (74.2%), the operation was done in two stages, and for 41 (24.8%), it was performed in 3 stages (most of them receiving high doses of corticosteroids or immunosuppressant medications). In this center, no patient underwent a one-stage surgery (Table 2).

Of the 159 patients who completed the questionnaire one year after the ileostomy closure, 108 (67.9%) had no complaints about fecal incontinence (score 0). They did not use pads and were satisfied with the operation results and their normal lifestyle. Total proctocolectomy and IPAA had no adverse effect on these patients' daily routines.

We found that 51 (32.1%) patients experienced some degree of fecal incontinence. The patients' mean CCFFIS score was 2.19 (0–19). For better evaluation, we made subgroups based on the CCFFIS score: mild incontinence (score 1–9), moderate incontinence (score 10–14), and severe and complete incontinence (score 15 and higher). Clinically, patients showing mild intensity and most patients with medium intensity experience improvement with supportive treatments, whereas patients with a high score (more than 15) require aggressive intervention for symptom amelioration (9). Among patients with incontinence, 39 (24.5%) experienced a mild degree of incontinence (rarely or sometimes less than 1 episode per week), 4 (2.5%) patients had moderate incontinence (more than 1 episode per week but not daily), and 8 (5%) people had severe and complete incontinence (Tables 3 and 4).

Table 2. Characteristics of the patients who entered in the study

Variables	Frequency	Percent	Valid percent	Cumulative percent
Age (y)				
≤15	2	1.3	1.3	1.3
16–24	13	8.2	8.2	9.4
25–34	63	39.6	39.6	49.1
35–44	45	28.3	28.3	77.4
45–54	19	11.9	11.9	89.3
55–64	16	10.1	10.1	99.4
65–75	1	0.6	0.6	100.0
Gender				
Female	87	54.7	54.7	54.7
Male	72	45.3	45.3	100.0
Technique of operation				
Laparoscopy	134	84.3	84.3	84.3
Open	15	9.4	9.4	93.7
Laparoscopy converted to open	10	6.3	6.3	100.0
Number of procedures				
One stage	0	0	0	0
Two stages	118	74.2	74.2	74.2
Three stages	41	25.8	25.8	100.0

There were no significant differences between men and women in terms of fecal incontinence (P value = 0.475), and most patients (67.9%) had normal continence after surgery, regardless of gender.

There was no correlation between the CCFFIS score and different age groups (one-way ANOVA, P value = 0.356).

As mentioned, in this center, all patients underwent IPAA surgery in two or three stages; the details of this operation are explained in the introduction section. Also, most patients underwent laparoscopic surgery using the standard technique. We found no difference between the median CCFFIS scores of patients with two- and three-stage operations (P value = 0.376). No difference was seen among the median CCFFIS scores of the patients who underwent laparoscopy, open surgery, and laparoscopy that converted to open surgery (P value = 0.319) (Table 5).

Discussion

Our study is the first conducted with a large sample size in a vast area of southern Iran to investigate the functional results of IPPA in patients who have UC. This study showed that (67.9%) of patients had normal defecation one year after operation, and their CCFFIS score was zero, which means they did not suffer from fecal incontinence.

This study included 159 patients, and the average age of the studied population was 36.81 (range 13–68) years. Of this number, 54.7% were female, and 45.3% were male,

Table 3. CCFFIS score in patients who underwent IPAA

Variables	Number of patients			
	Frequency	Percent	Valid percent	Cumulative percent
CCFFIS score				
0	108	56.5	67.9	67.9
1	8	4.2	5.0	73.0
2	9	4.7	5.7	78.6
3	2	1.0	1.3	79.9
4	2	1.0	1.3	81.1
5	4	2.1	2.5	83.6
6	2	1.0	1.3	84.9
7	2	1.0	1.3	86.2
8	4	2.1	2.5	88.7
9	6	3.1	3.8	92.5
10	1	.5	0.6	93.1
11	1	.5	0.6	93.7
12	2	1.0	1.3	95.0
15	3	1.6	1.9	96.9
16	2	1.0	1.3	98.1
17	1	.5	0.6	98.7
18	1	.5	0.6	99.4
19	1	.5	0.6	100.0
Total	159	83.2	100.0	

CCFFIS: Comprehensive Continence Frequency and Incontinence Scale; IPAA: ileal pouch-anal anastomosis.

Table 4. Frequency of patients who underwent IPAA based on the degree of continence

CCFFIS score	Frequency	Percent	Valid percent	Cumulative percent
Continent (score = 0)	108	67.9	67.9	67.9
Mild (1–9)	39	24.5	24.5	92.5
Moderate (10–14)	4	2.5	2.5	95.0
Severe (15–20)	8	5.0	5.0	100.0
Total	159	100.0	100.0	

IPAA: ileal pouch-anal anastomosis; CCFFIS: Comprehensive Continence Frequency and Incontinence Scale.

and there was no significant difference in the average age between the two sexes. This number is consistent with other studies (7,11,12).

Continence is a significant issue for patients who have UC and are candidates for restorative surgery. However, 67.9% of our patients had normal continence, 24.5% suffered from mild fecal incontinence, and only 5% experienced complete fecal incontinence after operations. This number was comparable to the rate reported in other series (3,13,14). The overall CCFFIS score in our study was 2.19, which is almost similar to the report of Jonker et al. in 2020 (3).

According to our survey findings, there was no significant difference between women and men regarding the prevalence of fecal incontinence after the operation. These results are similar to the results of Jonker and colleagues' report (3) but not consistent with the results of the study by Mège et al in 2016 (5)

Contrary to expectations, there was no significant difference in the incidence of fecal incontinence after surgery in different age groups. Hahnloser et al, in 2007, reported that fecal incontinence increases significantly with age, possibly because sphincter strength decreases with age (15). Others reported similar results. These results are in contrast with our findings (5,13).

In this study, no patient had a one-stage surgery; about three out of four patients underwent two-stage surgeries, and the others had three-stage surgeries. There was no significant difference between these groups regarding fecal incontinence and the CCFFIS score. Other studies have also found the postoperative morbidity and bowel function outcomes of different surgery types to be comparable (11,16).

Total proctocolectomy and IPAA is a complex surgery with extensive manipulation of the pelvis, and it is expected that reduction of pelvic manipulation in laparoscopic surgery will reduce the incidence of fecal incontinence. Our study showed that laparoscopic or open IPAA pouch creation did not affect the occurrence of fecal incontinence. Patients who had undergone either of the two (laparoscopic or open) surgeries had similar results in terms of fecal incontinence, which means there is no difference in functional results between these

Table 5. Comparison of CCFFIS scores according to demographic data and type of operation

Variables		CCFFIS score				*P* value*
		0	1–9	10–14	≥15	
Age groups (y)	≤15	1	0	1	0	0.356
	16–24	9	3	0	1	
	25–34	41	18	1	3	
	35–44	33	10	1	1	
	45–54	14	4	0	1	
	55–64	9	4	1	2	
	65–75	1	0	0	0	
Gender	Female	62	19	1	5	0.475
	Male	46	20	3	3	
Technique of operation	Laparoscopy	94	30	4	6	0.319
	Open	9	4	0	2	
	Laparoscopy converted to open surgery	5	5	0	0	
Number of procedures	One-stage	0	0	0	0	0.376
	Two-stage	84	26	2	6	
	Three-stage	24	13	2	2	

CCFFIS: Comprehensive Continence Frequency and Incontinence Scale; IPAA: ileal pouch-anal anastomosis

*Chi-square test and one-way ANOVA test were used; *P*-value > 0.05 was considered significant.

surgery techniques, with patients reporting similar and favorable outcomes. Maggiori et al in 2018 reported the same results, and other studies have also confirmed this finding (17,18). This finding demonstrated the safety of both methods regarding fecal continence in the hands of experienced surgeons. In all cases, pouch creation and ileal anastomosis were done with staplers, so we cannot evaluate the effect of the anastomosis technique on fecal incontinence.

Although fecal incontinence is not a fatal condition, its nature can profoundly impact an individual's quality of life and social engagement. This disorder can arise as a consequence of pelvic surgery, such as IPAA. The appropriate selection of patients plays a crucial role in preventing this complication. Our medical facility serves as a referral center for colorectal patients in the south of Iran; the decision to proceed with surgery for UC patients is made through a multidisciplinary approach involving colorectal surgeons and gastroenterologists specialized in treating inflammatory bowel disease. Furthermore, postoperative care and education are provided by a skilled team. The effective collaboration and comprehensive approach contribute to the low incidence of fecal incontinence following surgery. Multiple studies have demonstrated that institutions that perform more complex surgical procedures tend to achieve superior outcomes, a principle that holds for pouch surgery. Moreover, high-volume institutions manage adverse events better, which leads to better pouch salvage in the face of complications.

Therefore, if possible, ileo-anal pouch surgery should be conducted in high-volume specialist institutions (19).

Conclusion

Despite the remarkable progress in drug treatment of patients with UC, extensive total proctocolectomy surgery and the creation of IPAA are crucial treatment options for patients. Our study showed that despite concerns about functional complications and incontinence in defecation, IPAA leads to good long-term function with acceptable results considering incontinence. This study confirmed that total proctocolectomy with IPAA is a complex surgery that could have good functional results if patients are selected carefully and the surgery is performed by an experienced surgeon. The prevalence of inflammatory bowel disease, specifically UC, has witnessed a substantial surge in Iran, as well as other Asian nations.

Additionally, it is worth noting that most individuals affected by UC fall within the younger demographic range (20,21). Consequently, it becomes imperative to develop comprehensive and wide-ranging prospective studies encompassing multiple centers, with a larger participant pool and an extended duration of follow-up. The primary aim of such investigations would be to elucidate and ascertain the precise impact of surgical interventions on fecal continence in these patients.

Authors' Contribution

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Writing–review & editing: Maryam Kouhestani Parizi.

Competing Interests

None.

Ethical Approval

The study was reviewed and approved by the Ethics Committee of Shiraz University of Medical Sciences (ethical code IR. SUMS. REC.1400.251). Moreover, informed written consent was obtained from all participants.

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