
SHORT- AND LONG-TERM OUTCOMES OF ILEAL POUCH-ANAL ANASTOMOSIS FOR ULCERATIVE COLITIS

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Ileal pouch-anal anastomosis was an important advancement in the treatment of ulcerative colitis. The aim of this study was to determine whether early complications of ileal pouch-anal anastomosis in patients with ulcerative colitis are associated with poor late functional results.

PATIENTS AND METHODS: Eighty patients were operated on from 1986 to 2000, 62 patients with ileostomy and 18 without. The early and late complications were recorded. Specific emphasis has been placed on the incidence of pouchitis with prolonged follow-up.

RESULTS: The ileostomy was closed an average of 9.2 months after the first operation. Fourteen patients were excluded from the long-term evaluation; 6 patients were lost to regular follow-up, 4 died, and 4 patients still have the ileostomy. Of the 4 patients that died, 1 died from surgical complications. Early complications after operation (41) occurred in 34 patients (42.5%). Late complications (29) occurred in 25 patients as follows: 16 had pouchitis, 3 associated with stenosis and 1 with sexual dysfunction; 5 had stenosis; and there was 1 case each of incisional hernia, ileoanal fistula, hepatic cancer, and endometriosis. Pouchitis occurred in 6 patients (9.8%) 1 year after ileal pouch-anal anastomosis, 9 (14.8%) after 3 years, 13 (21.3%) after 5 years, and 16 (26.2%) after more than 6 years. The mean daily stool frequency was 12 before and 5.8 after operation. One pouch was removed because of fistulas that appeared 2 years later.

CONCLUSIONS: Ileal pouch-anal anastomosis is associated with a considerable number of early complications. There was no correlation between pouchitis and severe disease, operation with or without ileostomy, or early postoperative complications. The incidence of pouchitis was directly proportional to duration of time of follow-up.

DESCRIPTORS: Ulcerative colitis. Ileoanal anastomosis. Ileostomy. Pouchitis.

The development of the ileal pouch-anal anastomosis (IPAA) technique was an important advancement in the treatment of ulcerative colitis. Total colectomy cures the gastrointestinal symptoms and eliminates the risk of cancer, and the ileal pouch-anal anastomosis preserves anorectal functions. This procedure is now widely accepted and because of its advantages has been increasingly performed in most patients with ulcerative colitis. Surgical treatment is being

indicated sooner and more frequently. Many of these patients are young with a long life expectancy. Patient satisfaction with the procedure is high (73.3%)^{1,2}. However, patients may experience various episodic or continuous symptoms. We have observed that

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postoperative complications even when the operations were performed by highly qualified surgeons were not negligible, and in the long-term follow-up, the results were not as good as expected.

The aim of this study was to determine whether early complications of IPAA in patients with ulcerative colitis are associated with poor late functional results. Specific emphasis has been placed on the incidence of pouchitis with prolonged follow-up.

PATIENTS AND METHODS

Eighty patients underwent IPAA from 1986 to 2000. Forty patients were female. The mean age of first symptoms was 26.6 years.

The average time between first symptoms and diagnosis was 1.4 years and between first symptoms and operation was 4.8 years. Diagnosis was based on clinical, endoscopic, and histopathological criteria. Mean follow-up was 9.0 years. Two hundred operations were performed, an average of 2.5 operations / patient. The surgical procedure consisted of abdominal proctocolectomy and construction of a 15 cm ileal J-pouch using staplers or hand-sewn (first 9 cases). All patients had preoperative bowel preparation and all received antibiotics.

Thirty-one patients had a colectomy and ileostomy performed previously. Later on, 26 underwent IPAA, receiving a J-shaped ileal pouch with ileostomy, and 5 without ileostomy.

Forty-nine patients underwent IPAA, with ileostomy in 36 and without in 13. The ileostomy was closed 9.2 months on average after the first operation.

All peri-operative complications as well as early (within 1 month) and late (more than 1 month) complications after discharge from hospital were recorded. All complications, even small ones and not procedure-related, were recorded. Information was obtained regarding bowel function, anal continence, abdominal pain, and need for drugs before and after surgical treatment. Minor incontinence was defined as the presence of spotting on underwear at least once a week.

The diagnosis of pouchitis was made based on clinical, endoscopic, and histological manifestations. Clinical evaluation included the length of time between IPAA and the first episode of pouchitis, the number of episodes (one, multiple, or chronic), and

the result of treatment.

Fourteen patients were excluded from the long-term evaluation: 6 patients were lost to regular follow-up; 4 died; and 4 still have the ileostomy (1 of whom refuses closure for personal reasons).

At each consultation, every 6 months, the patient's recent history was recorded and he or she underwent a clinical and endoscopic examination. Random biopsy was taken only in cases of clinically suspected pouchitis.

STATISTICS

Comparisons of proportions were made with the χ^2 test. Values of less than $p = 0.05$ were considered statistically significant.

RESULTS

Mortality

Four patients died. One death was caused by surgical complications. Two patients died of cancer, 1 hepatic and 1 colonic. One patient died from causes not related to ulcerative colitis or its surgical treatment.

Postoperative morbidity

EARLY COMPLICATIONS

Thirty-four patients (42.5%) presented 41 complications after IPAA .

The following early complications related to the J-pouch were diagnosed: 7 leakages of pouch-anal anastomosis (11.5%), 2 were re-operated, 1 of which resulted in death with pelvic sepsis; 4 subcutaneous wound infections; 4 intestinal obstructions (6.5%) handled conservatively; and 1 each of the following vaginal secretion (for more than a month), fever of unknown etiology, cerebral vascular accident and bleeding requiring reoperation.

The total number of ileostomies constructed was 68 including 62 IPAA with ileostomies and 6 performed for treatment of leakage, 4 after ileostomy closure and 2 after IPAA without ileostomy. The following early complications related to ileostomy were diagnosed: ileostomy disfunction and dermatitis. Fourteen patients had complications after the ileostomy closure: 1 had a subcutaneous wound infection; 5 had anastomotic leakage; and 8 had an intestinal obstruction, 1 of whom underwent reoperation.

Five patients with anastomotic leakage after ileostomy closure underwent reoperation, and 4 new ileostomies were performed and successfully closed later on. One patient underwent intestinal resection and suture. He presented an incisional hernia that required surgical correction.

Six of 18 patients undergoing IPAA without ileostomy presented early complications (33.3%). Anastomotic leakage occurred in 2 patients (11.1%) requiring reoperation with construction of a defunctioning loop ileostomy that was closed later on. Two patients presented with perianal dermatitis, 1 with urinary retention and 1 with an intestinal obstruction.

LATE COMPLICATIONS

Twenty-five patients presented 29 late complications: 16 had pouchitis, 3 associated with stenosis and 1 with sexual dysfunction; 5 had stenosis; and 1 each had incisional hernia, ileoanal fistula 2 years after creation of the J-pouch, hepatic cancer, and endometriosis.

Seventeen patients who had a defunctioning ileostomy presented the following late complications: 11 had pouchitis, 5 had stenosis, and 1 each had ileo-anal fistula, hernia, endometriosis, and sexual dysfunction. The fistula appeared 2 years after IPAA , and the pouch was excised 6 years after IPAA surgery.

Seven patients of the 16 undergoing IPAA without ileostomy presented 8 late complications: 5 had pouchitis and 3 had stenosis. The stenosis were treated successfully by anal dilatation.

There was no statistically significant association regarding frequency of complications and the performance or not of ileostomy during the IPAA surgery. ($p = 0.592$).

Pouchitis

Pouchitis occurred in 16 patients an average 36.5 months after the closure of the ileostomy (range 1 to 72 months). It was acute in 8 patients and chronic in 8. There were 7 patients who underwent the IPAA surgery with a toxic megacolon; none developed pouchitis.

The association of postoperative complications and pouchitis were analyzed (Table 1). The χ^2 test did not show strong statistical evidence of association between the variables ($p = 0.113$).

We compared the incidence of pouchitis and the IPAA surgery with or without ileostomy (Table 2). There was no statistical evidence of association between the variables ($p = 0.452$).

Six patients had pouchitis 1 year after IPAA (9.8%), 9 (14.8%) after 3 years, 13 (21.3%) after 5 years, and 16 (26.2%) after more than 6 years.

Pouch failure

One pouch was removed because of fistulas that appeared 2 years after IPAA. The fistulas were not responsive to any kind of treatment. There was no sign of Crohn’s disease, and after removal of the pouch the patient become asymptomatic.

Stool frequency and continence

The mean daily stool frequency was 12 before and 5.8 after IPAA. Sixty-two percent reported a decrease of the mean stool frequency from 14 to 6, 23.4% had an increase from 6 to 9, and 14.1% had no change. Minor anal incontinence was reported by 2 patients before and 6 after IPAA.

Other symptoms and need for medication

Bleeding was reported by 47 of patients before and 10 after IPAA, and abdominal pain was reported by 41

before and 12 after IPAA. All patients except 1 received medication before surgical treatment. After IPAA, 32 needed medication occasionally as follows: 17 were medicated with metronidazole, 14 with ciprofloxacin, 14 with steroids, 4 with azathioprine, and 3 with sulfasalazine/5-ASA.

DISCUSSION

Ileal pouch-anal anastomosis has become the method of choice for the surgical treatment of ulcerative colitis. Initially, we performed a loop ileostomy in all patients. Loop ileostomy is associated with complications, is difficult to manage, requires the use of expensive bags, and requires a second operation for closure with potential morbidity. We practice at a state hospital with a long queue of patients awaiting hospitalization, explaining the long interval between the construction of ileostomy and its closure. Based on the experience of others^{3,4} we decided to use a covering ileostomy selectively only for patients thought to have an increased risk of anastomotic leakage. Preoperative use of high doses of steroids was not a formal indication to perform an ileostomy.

Another important aspect concerning defunctioning ileostomy is that of the 7 anastomotic leaks that occurred after IPAA in the ileostomy group, 2 patients needed reoperation, and 1 died. Therefore, the ileostomy did not prevent pelvic sepsis, probably due to error of construction. On the other hand, 2 patients undergoing IPAA without ileostomy needed a second surgery for treatment of leakage. Since the use of ileostomy was not randomized but was a conscious option of the surgeon, we believe that if it had not been performed, the number of complications would have been higher. An increasing number of sur-

Table 1 - Early postoperative complications and pouchitis.

Postoperative complications	Pouchitis		Total
	n (%) With	n (%) Without	
With	9 (13.6)	17 (25.8)	26 (39.4)
Without	7 (10.6)	33 (50.0)	40 (60.6)
Total	16	50	66 (100)

$p = 0.113$

Table 2 - Incidence of pouchitis and the ileal pouch-anal anastomosis with or without ileostomy.

Ileostomy	Pouchitis		Total
	n (%) With	n (%) Without	
With	11 (16.7)	39 (59.0)	50
Without	5 (7.6)	11 (16.7)	16
Total	16	50	66 (100%)

$p = .452$

geons are performing this operation without ileostomy^{2,5,6}. Mowschenson *et al.*² performed 78.5% of their IPAA procedures without ileostomy, with 9.8% of cases with anastomotic leakage requiring a diverting stoma. In our experience, the possibility of performing IPAA without ileostomy was the opposite (22.8%), with a similar percentage of leakage (11.1%). The problem is how to determine which patients should have or not have an ileostomy. Even if we knew, it is important that the patient and his or her family accept the risk of an anastomotic leak requiring additional surgery, and with a high possibility of having the pouch removed in the follow-up with creation of a permanent ileostomy.

Morbidity in this series was high, probably because patients with indication for surgery had extensive disease; most of them were undernourished, anemic, and using medication that causes immunosuppression.

Mortality rate related to surgery was low (1.25%). These data are in agreement with other reports^{7,8}. Of the 3 deaths in the late follow-up, 2 patients died of cancer, 1 of which was colonic. It is well known that patients with ulcerative colitis are at an increased risk for development of carcinoma of the colon and rectum. Whether to perform IPAA in patients with carcinoma complicating ulcerative colitis is not entirely clear based on the literature⁹. We indicate the procedure as long as a radical cancer surgery is possible to perform in patients with a relatively favorable long-term prognosis from cancer based on stage and grade^{9,10} and in patients whose pouches will not be exposed to subsequent radiation therapy¹¹.

Ileal pouch-anal anastomosis is a technically demanding operation that can be associated with serious complications. The number of patients with early complications was high (34 = 42.5%), but only 10 (12.5%) needed a

second operation. Nevertheless, our data show that IPAA with or without ileostomy is associated with elevated incidence of early complications and should be performed only in specialized centers.

Pouch-anal anastomotic stricture was more frequent in the group undergoing IPAA without (31.3%) than with (4.7%) ileostomy and was easily corrected by digital dilatation in every case.

Anal dilatation required in transanal mucosectomy in hand-sewn IPAA or the transection of bowel at the transitional zone damaging the internal sphincter in stapled IPAA imply a risk of incontinence. It was considered as a minor disability by our patients. The infrequency of anal irritation is also a reflection of good continence and minimal stool leakage.

Small bowel obstruction is observed frequently before ileostomy closure and remains a potential problem after closure⁸. In our experience, 69% of the 13 cases occurred after ileostomy closure. According to Meagher *et al.*⁸, the number of patients suffering an episode of small bowel obstruction following IPAA will increase for up to 10 years after operation, as might be anticipated after any major abdominal procedure.

Sexual dysfunction following IPAA is uncommon.

Only one pouch was excised in this series.

Pouchitis was the most frequent late complication and clearly related to a worse outcome. It was directly proportional to the length of follow-up.

The etiology of pouchitis remains unknown. Possible causes are fecal stasis resulting in bacterial overgrowth and infection¹², microbial imbalance¹³, production of volatile fatty acids^{14,15}, ischemia¹⁴, oxygen free radical injury¹⁶, nitric oxide¹⁷, deprivation of short chain fatty acids^{18,19}, and extracolonic manifestation of ulcerative

colitis. Penna *et al.*²⁰ reported a strong correlation between primary sclerosing cholangitis and pouchitis, suggesting a common link in their pathogenesis. Teixeira *et al.*²¹ showed that pouchitis was more frequent in patients with extra-intestinal manifestations.

The reported rates of prevalence of pouchitis in patients undergoing surgery for ulcerative colitis vary between 5%²² and 47%²³.

Acute pouchitis was more frequent (21.3%) than chronic pouchitis (4.9%), as described by others^{22,24,25}. Penna *et al.*²¹ reported a cumulative risk of developing pouchitis 1, 2, 5, and 10 years after IPAA of 16%, 23%, 36%, and 46%, respectively. Luukkonen *et al.*²² found a cumulative risk of 50% at 4 years and a 7 % at 6 years. Heuschen *et al.*²⁴ reported a cumulative risk of 50% of pouchitis at 8 years after IPAA. Yu *et al.*²⁶ found after 10 years of follow-up an overall incidence of any complication of 48%, 50% of these due to pouchitis.

There was no correlation between pouchitis and early postoperative complications.

Pouchitis was more frequent in the group undergoing IPAA without ileostomy, and we do not know how to explain this finding. The correlation between complications after operation and incidence of pouchitis was expected but not statistically significant. Patients that experience complications in general are the ones with more extensive and severe disease, and pouchitis could be accepted as an extracolonic manifestation of ulcerative colitis. To what extent the presence of extraintestinal manifestations should influence the choice of surgical treatment is not clear. Further studies are required to address this issue⁷.

Patients should be informed with details of the consequences of the IPAA procedure by the surgeon to avoid high expectations. Many patients hope that

after the operation they will be absolutely normal with the same quality of life they had before developing ulcerative colitis. Our data show that sometimes the results can be disappointing. The mean stool frequency of our patients after IPAA is similar to the described by other authors⁸. Even in those patients with a decreased rate of evacuations, the average number is higher than the expected in a normal person. In 37.5% of the patients, the mean stool frequency did not change or even increased. Concerning other symptoms, such as abdominal pain and bleeding, results were better, but 29.5% and 25.5% respectively showed no improvement. Six patients (9.8%) still experienced minor incontinence, which is a small number in our estimation. But it is important to remember that some patients experienced an eventual epi-

sode of major incontinence, very exceptional to be considered in this paper but enough to make the patient lose confidence for several months.

Clinical intractability is the main indication for surgical treatment. Therefore, patients expect to stop taking medication after the operation, but 52.5% of our patients needed sporadic or continuous medical treatment because of pouchitis or pouch dysfunction. Ileal pouch-anal anastomosis without ileostomy is relatively safe if the patient and the family clearly accept the risk of an early postoperative anastomotic leakage².

There is still the risk of neoplastic transformation in the pouch, mainly in cases of chronic pouchitis^{27,28} or in the remaining anal mucosa. Ileal pouch-anal anastomosis requires regular surveillance²⁴.

CONCLUSIONS

1. Ileal pouch-anal anastomosis is associated with a considerable number of early complications. There was no correlation between pouchitis and early postoperative complications.
2. Pouchitis was directly proportional to the length of follow-up. Severe disease was not associated with pouchitis.
3. Ileal pouch-anal anastomosis is the surgical therapy of choice for patients with ulcerative colitis, but the patient should be informed of the possibility of the eventual need for the use of medications after the operation, of unsatisfactory functioning of the pouch, and the possibility of late complications, including removal of the pouch.

RESUMO

TEIXEIRA MG e col. - Resultado precoce e tardio da anastomose íleo-anal com reservatório ileal na retocolite ulcerativa. **Rev. Hosp. Clín. Fac. Med. S. Paulo** 58(4): 193-198, 2003.

A anastomose íleo-anal com reservatório ileal foi um importante avanço no tratamento da retocolite ulcerativa. O objetivo deste trabalho foi determinar se os maus resultados funcionais tardios estariam relacionados às complicações precoces da anastomose íleo-anal com reservatório ileal em doentes com retocolite ulcerativa.

MATERIAL E MÉTODO: Oitenta doentes foram operados entre 1986 e 2000, 60 com ileostomia de proteção e 18 sem. Os doentes foram avaliados quanto a incidência de compli-

cações pós-operatórias precoces e tardias. Enfatizou-se a incidência de bolsite no pós-operatório prolongado.

RESULTADO: A ileostomia foi fechada em média 9,2 meses após a primeira operação. Quatorze doentes foram excluídos da avaliação tardia: seis perderam o seguimento e quatro faleceram. Quatro doentes permanecem com a ileostomia. Trinta e quatro doentes (42,5%) apresentaram 41 complicações precoces. Vinte e cinco apresentaram 29 complicações tardias: 16 bolsites, três associadas a estenose e uma a disfunção erétil; cinco estenoses e uma de cada das seguintes: hérnia incisional, fístula íleoanal, câncer hepático e endometriose. Seis doentes apresentaram bolsite um ano após a anastomose íleoanal com reservatório

íleo (9,8%), nove (14,8%) após três anos, 13 (21,3%), após cinco anos e 16 (26,2%) após seis anos. A frequência diária média de evacuação era de 12 antes e de 5,8 após a operação. Um reservatório foi removido devido ao aparecimento de fístulas dois anos depois.

CONCLUSÃO: A anastomose íleo-anal com reservatório ileal está associada com número considerável de complicações. Não há correlação entre bolsite e doença grave, operação com ou sem ileostomia ou complicações pós-operatórias imediatas. A incidência de bolsite foi diretamente proporcional ao tempo de seguimento.

DESCRITORES: Retocolite ulcerativa. Anastomose íleoanal. Ileostomia. Bolsite.

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