

Three Step Ileal Pouch Surgery: Why is it Worth it?

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Total colectomy with ileal pouch is the procedure of choice in patients with ulcerative colitis (UC), familial adenomatous polyposis (FAP) and selected cases of Crohn's disease (CD). In the United States (USA) rates of inflammatory bowel disease (IBD) are increasing and, despite medical advances, new biological agents, and the emergence of multidisciplinary IBD groups, approximately one third of UC patients require surgery at some point in life.¹

Currently, in specialized centers ileal pouch surgery is successful in more than 95% of cases.² The success of the ileal pouch is measured in quality of life and depends on several factors, with perioperative complications being the main determinants of long-term function, especially septic complications secondary to an anastomotic dehiscence.³

For this reason, ileal pouch surgery has been developed in stages, minimizing morbidity and optimizing the patient's condition. This is especially important in patients undergoing emergency surgery, most of whom are malnourished and under immunosuppressive treatments.

The three stages consist of total colectomy with terminal ileostomy, followed by proctectomy and loop ileostomy 6 months after colectomy. Finally, the ileostomy closure is performed three months later, after a radiological study with water-soluble contrast showing the pouch's integrity. Less conservative alternatives include two-stage surgery (proctocolectomy with ileal pouch and loop ileostomy, followed by ileostomy closure), modified two-stage surgery (total colectomy with end ileostomy, followed by proctocolectomy with ileal pouch) and finally surgery in one stage (total proctocolectomy with ileal pouch).

In the literature, the frequency with which the three-stage approach is used varies greatly, with reports ranging from 11 to 69% of cases;^{4,5} which suggests that the choice of approach is determined more by the center and its surgical practice than by the characteristics of the patient.

Regarding functional results, the series agree that three-stage surgery has the same or better results than two-stage surgery.^{4,6-8} Something similar occurs with postopera-

tive complications and rates of pelvic sepsis. Most series, with few exceptions, report more favorable results with three-stage surgery, or similar between the two approaches. Table 1 summarizes the results of the most representative series.

A 2013 retrospective study with 147 patients over 10 years of experience demonstrated that three-stage surgery had fewer postoperative complications than two-stage surgery; however, both approaches had the same failure/pouch loss rates. Interestingly, an update of this series, now with 212 patients, did not find a greater association with complications of the two-stage surgery. Analyzing the data in detail, although the difference was not statistically significant, patients operated on in two stages had almost twice as many anastomotic dehiscences as those operated on in three (9.6 vs. 5%).⁹ Despite this, the functional results were similar between groups.

In the absence of prospective randomized controlled studies, the best available evidence is probably that obtained through analyzes using the database of the National Surgical Quality Improvement Program of the American College of Surgeons. Two studies with more than 2000 patients are the most significant. The first, from 2015, reviewed trends in ileal pouch surgery in the US from 2005 to 2011. The authors demonstrated that more than 70% of the procedures included in the database were performed in two stages. The complication rate was similar 11.5 vs. 9.4%, $p = 0.1$. However, the profile of complications was different. While the patients operated on in three stages had more infections of the surgical wound (11.5 vs. 7.3%, $p < 0.01$), the patients operated on in two stages had more intra-abdominal/pelvic infections (9.4 vs. 6.7%, $p = 0.05$) and required more reoperations (8 vs. 4.4%, $p < 0.01$). The same study also demonstrated that patients operated on in three stages received fewer perioperative corticosteroids, had less weight loss, better albumin levels, and less preoperative sepsis at the time of pouch surgery.¹⁰ In other words, at the time of pouch surgery, patients operated on in three stages were in better general condition. The second study in question analyzed the same database from 2011 to 2015. The authors compared the incidence of reoperations and complications in patients undergoing pouch surgery at the time of colectomy vs. patients in whom the pouch was delayed. Out of 2395 patients,

The authors declare that they have no conflict of interest.

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Recibido: May, 2020. Accepted: June, 2020.

TABLE 1: RESULTS OF SERIES COMPARING ILEAL POUCH SURGERY IN TWO VS. THREE STAGES

Autor	Year	n	% 3T	Complications/ Sepsis	Evacuation function
Nicholls ⁶	1989	152	62%	No difference	Best 3T
Galandiuk ⁴	1991	871	11%	3T more septic complications, less bowel obstruction	Similar results
Penna ⁷	1993	156	50%	2T more complications and reoperations	Best 3T
Heustchen ¹³	2002	554	29%	No difference at 1 and 3 years follow-up	NR
Swenson ⁸	2005	54	57%	No difference	Similar results
Lim ¹⁵	2007	335	NR	No difference	NR
Hicks ¹⁶	2013	144	19.4%	2T more complications, same AD rate	NR
Gu ⁵	2013	588	69%	Sepsis: 2T 18% vs 3T 8%	NR
Bikhchandani ¹⁰	2015	2002	27.5%	No difference	NR
Kochar ¹¹	2018	2395	34%	3T fewer reoperations and complications	NR
Lee ⁹	2019	212	25.9%	No difference	Similar results

*3T: three-stage surgery. 2T: two-stage surgery. NR: not reported. AD: anastomotic dehiscence.

34% were treated with delayed surgery and presented significantly fewer reoperations as well as complications during the first 30 postoperative days.¹¹

The reality is that the more interventions performed, the longer the time that patients will be with an ileostomy, and each intervention has its own complications (endotracheal intubation, surgical site infections, postoperative pain, hospitalizations and costs) which must be discussed in each case. Despite this, there are several advantages of a three-stage approach: a) the colon can be analyzed obtaining an accurate diagnosis of UC or CD as well as dysplasia and eventually cancer (which may require adjuvant treatment) prior to proctectomy, b) the mesentery undergoes a certain degree of stretching with the terminal ileostomy (which would allow a better pouch construction), c) the loop ileostomy minimizes the complications of a possible anastomotic dehiscence and d) the proctectomy along with its morbidity is delayed for three months allowing a better physical and mental preparation of the patient before the pouch surgery.

Patients receiving biologics constitute a particular risk

group. Although early reports found no relationship between the use of biologics and postoperative complications,^{12,13} a more recent study from the Cleveland Clinic, from 2013, with 588 patients demonstrated that the use of biologic agents is an independent variable associated with development of pelvic sepsis in multivariate analysis (HR 2.62; p = 0.02).⁵ Coinciding with this, the Cornell University group using a New York State Department of Health database conducted a retrospective study with little more than 7000 patients. The authors demonstrated that since infliximab was approved, UC patients not only continued to require surgery, but suffered more and greater complications in the post-infliximab era.¹⁴ This weakened population is precisely the group that, in our opinion, benefits the most from a three-step procedure. These considerations led us to indicate three-stage surgery in practically all cases. The possibility of a septic complication with its functional consequences is a very high price to be paid by the patient and it is the surgeon's responsibility to optimize the conditions to minimize the morbidity of an already complex procedure (Table 1).

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