



# Comparing laparoscopic versus open ileal pouch-anal anastomosis: current issues and future considerations

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Widespread advancement in laparoscopic surgical technique particularly over the last decade, has resulted increasing adoption of this approach in restorative proctocolectomy (RP) and ileal pouch-anal anastomosis (IPAA).

RP is the definitive procedure in the surgical management of ulcerative colitis (UC) and familial adenomatous polyposis (FAP), where proctocolectomy eliminates the risk of developing neoplasia in both conditions, and provides relief of symptoms in UC particularly in patients who have remained refractory to medical treatment (1,2). Indications for the operation have extended to selected cases of Crohn's Disease (CD), and indeterminate colitis (IC) (3,4).

Since the days when Kock showed that the ileum was a suitable reservoir as a continent ileostomy, Parks and Nicholls in 1978 described the creation of the IPAA which has thenceforth been established as standard treatment. Successful operative outcomes enable patients to preserve bowel continuity and retain their ability to defecate per anally, and avoid the medical and psychosocial complications associated with permanent stomas. In addition, the creation of a reservoir for stool storage aims to replicate rectal function and minimize bowel dysfunction in the long term.

In the original procedure as described for ulcerative colitis, the surgery consisted of a proctocolectomy, mucosectomy of the remnant rectal stump, creation of an S-shaped pouch from the terminal ileum, pulled through the denuded rectum and anastomosed at the mid-anal canal with a covering ileostomy (5). Although RP-IPAA is commonly performed in colorectal centers worldwide, there remains considerable heterogeneity in numerous elements

of this surgical procedure, which have evolved with time in keeping with experience and emerging evidence (6). These aspects include the type of approach (open, laparoscopic-assisted, hand-assisted laparoscopic, totally laparoscopic, or robotic), optimal pouch design and configuration, method of anastomosis (hand-sewn or stapled), and selective use of defunctioning loop ileostomy. Several systematic reviews and meta-analyses have attempted to address these issues (7-9), however these are largely based upon retrospective and/or non-randomized studies, and robust level 1 evidence has remained scarce in literature (10,11).

In the current issue of *World Journal of Surgery*, an interesting and pertinent case-matched comparative analysis has been published, comparing laparoscopic versus open IPAA in terms of long-term functional and quality of life outcomes (12). This article addresses the ongoing debate surrounding the benefits and shortcomings of the laparoscopic approach, and also highlights several issues regarding RP-IPAA that merit further discussion.

Firstly, since the earliest experience with laparoscopic proctocolectomy and subsequent pouch formation described in 1992 (13,14), the nomenclature of the types of approach to this surgical procedure has still not been standardized. Continued innovation and refinement in laparoscopic surgical technique over time have allowed us to witness the evolution from the initial use of an additional small abdominal incision to facilitate the operation, to the subsequent 'incision-less' totally laparoscopic procedure where specimen retrieval and pouch creation were performed through the proposed ileostomy site in the

right iliac fossa (RIF). Furthermore, single-port RP-IPAA represents the development of yet another minimally-invasive approach (15).

The Cochrane review compared open versus laparoscopic-assisted IPAA for UC and FAP, wherein laparoscopic IPAA was defined to include all laparoscopic cases irrespective of the number of trocars used, while laparoscopic-assisted IPAA included those cases in which an additional small abdominal incision (e.g., Pfannenstiel or subumbilical midline incision) was made (8). How 'small' this incision should be was not clearly specified.

Many studies from those published earlier in the 1990s and 2000s to more recent publications, do not make such a distinction between totally laparoscopic RP-IPAA and laparoscopically-assisted approach. In fact, in contrast to the Cochrane definition, most studies consider the use of abdominal incisions placed at the proposed RIF ileostomy site, peri-umbilical or suprapubic region for specimen delivery and pouch creation, a 'totally laparoscopic' procedure (16,17).

This includes the LapConPouch randomized trial which stipulated the use of a 4 cm umbilical incision for evisceration of the colon and extracorporeal construction of the ileal-anal pouch (18). In addition, hand-assisted laparoscopic cases have been considered and even grouped together with laparoscopic cases, and used for comparison against the conventional open approach. Conversion into laparotomy generally constitutes any unplanned abdominal incision to perform parts of the operation. Similarly, this has also been inconsistently defined. Some authors have specified that the unplanned incision should be longer than 6 cm to be considered a conversion, while some others defined the use of open techniques to manage unanticipated intraoperative difficulties as a conversion, regardless of the length of incision (16,17,19).

The lack of a consensus in what constitutes a laparoscopic or laparoscopic-assisted RP-IPAA or a conversion to laparotomy, as well as constant evolution and progress in surgical innovation and technique, will inevitably introduce potential biases which can make interpretation and comparison of outcomes between the laparoscopic versus approach challenging. Differences in short-term perioperative outcomes between these two approaches have been well described. Patients undergoing laparoscopic RP-IPAA tended to have lower blood loss, reduced postoperative pain and rates of wound infection, shorter duration of hospital stay and better cosmesis, although operative time generally tended to be longer (7,8).

The complication rates, morbidity and mortality rates did not differ between these two approaches.

Published data over the past decade indicate that laparoscopic RP-IPAA is at least as safe and effective as the open approach with comparable short-term outcomes. These observations are largely based on retrospective case series and cohort studies, as evidence from well-designed and sufficiently powered randomized trials is lacking. The first randomized controlled trial (RCT) comparing hand-assisted laparoscopic versus open RP-IPAA for UC and FAP patients did not show any significant differences in quality of life (QOL) during the first 3 months of postoperative recovery as the primary outcome (10). Another RCT compared laparoscopic versus open RP-IPAA reported no significant difference in intraoperative blood loss between these two approaches, however the trial was terminated due to inadequate patient accrual (11).

As for long-term outcomes after RP-IPAA, comparative data between the laparoscopic and open group of patients originate mainly from matched cohort studies and prospective non-randomized trials. While the results of patients who have undergone open RP have been comprehensively evaluated (20), reports of long-term functional outcomes of the laparoscopic group are relatively less ubiquitous. Inherent limitations include the relatively small eligible patient population, rising adoption of the laparoscopic approach (9), the concentration of laparoscopic technical expertise at a handful of specialized high-volume centers, and to some extent publication bias. Not surprisingly, authors have attempted to surmount these limitations by comparing these two patient groups from two different time periods.

The most common long-term outcomes evaluated are pouch function, late complications, overall patient satisfaction and quality of life. We note that among these four aspects, there are certain areas which overlap and are closely correlated. Pouch function is generally quantified using customized or standardized questionnaires (21). Symptoms include stool frequency, incontinence, use of pads, urgency, ability to discriminate gas from stools, perineal soreness and anal pain. The requirement of anti-diarrheal medications or antibiotics is usually sought. Late complications include small bowel obstruction, anastomotic stricture, pouch-related fistula, pouchitis and pouch failure (17). Pouchitis is a common condition with rising cumulative incidence over time, and considered to be a significant contributory factor to pouch failure and functional outcome (22,23). The wide disparity in the

published prevalence of pouchitis, ranging from 20–70%, has been attributed to heterogeneity in the definition of pouchitis and duration of follow-up. Similarly, the modalities of assessment of patient satisfaction and quality of life after surgery differ significantly across studies, limiting meaningful comparisons.

The current evidence supports the laparoscopic approach to be employed for RP-IPAA after judicious case selection, enabling patients to benefit from faster convalescence, better cosmesis, without compromise in long term functional outcomes. While it is ideal to seek well-designed and adequately-powered randomized trials to illustrate this, the relatively small patient numbers as clearly observed in the LapConPouch study suggest that we have to settle for long term results from cohort and case-control studies. Efforts to standardize reporting outcomes in future studies can certainly facilitate better comparability.

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### References

1. da Luz Moreira A, Church JM, Burke CA. The evolution of prophylactic colorectal surgery for familial adenomatous polyposis. *Dis Colon Rectum* 2009;52:1481-6.
2. Øresland T, Bemelman WA, Sampietro GM, et al. European evidence based consensus on surgery for ulcerative colitis. *J Crohns Colitis* 2015;9:4-25.
3. Panis Y, Poupard B, Nemeth J, et al. Ileal pouch/anal anastomosis for Crohn's disease. *Lancet* 1996;347:854-7.
4. Siassi M, Weiger A, Hohenberger W, et al. Changes in surgical therapy for Crohn's disease over 33 years: a prospective longitudinal study. *Int J Colorectal Dis* 2007;22:319-24.
5. Parks AG, Nicholls RJ. Proctocolectomy without ileostomy for ulcerative colitis. *Br Med J* 1978;2:85-8.
6. Remzi FH, Lavryk OA, Ashburn JH, et al. Restorative proctocolectomy: an example of how surgery evolves in response to paradigm shifts in care. *Colorectal Dis* 2017;19:1003-12.
7. Tilney HS, Lovegrove RE, Heriot AG, et al. Comparison of short-term outcomes of laparoscopic vs open approaches to ileal pouch surgery. *Int J Colorectal Dis* 2007;22:531-42.
8. Ahmed Ali U, Keus F, Heikens JT, et al. Open versus laparoscopic (assisted) ileo pouch anal anastomosis for ulcerative colitis and familial adenomatous polyposis. *Cochrane Database Syst Rev* 2009;(1):CD006267.
9. Singh P, Bhangu A, Nicholls RJ, et al. A systematic review and meta-analysis of laparoscopic vs open restorative proctocolectomy. *Colorectal Dis* 2013;15:e340-51.
10. Maartense S, Dunker MS, Slors JF, et al. Hand-assisted laparoscopic versus open restorative proctocolectomy with ileal pouch anal anastomosis: a randomized trial. *Ann Surg* 2004;240:984-91; discussion 991-2.
11. Schiessling S, Leowardi C, Kienle P, et al. Laparoscopic versus conventional ileoanal pouch procedure in patients undergoing elective restorative proctocolectomy (LapConPouch Trial)-a randomized controlled trial. *Langenbecks Arch Surg* 2013;398:807-16.
12. Lavryk OA, Stocchi L, Ashburn JH, et al. Case-Matched Comparison of Long-Term Functional and Quality of Life Outcomes Following Laparoscopic Versus Open Ileal Pouch-Anal Anastomosis. *World J Surg* 2018. [Epub ahead of print].
13. Peters WR. Laparoscopic total proctocolectomy with creation of ileostomy for ulcerative colitis: report of two cases. *J Laparoendosc Surg* 1992;2:175-8.
14. Wexner SD, Johansen OB, Nogueras JJ, et al.

- Laparoscopic total abdominal colectomy. A prospective trial. *Dis Colon Rectum* 1992;35:651-5.
15. Goede AC, Reeves A, Dixon AR. Laparoscopic restorative proctocolectomy: a 10-year experience of an evolving technique. *Colorectal Dis* 2011;13:1153-7.
  16. Campos FG, Real Martinez CA, Monteiro de Camargo MG, et al. Laparoscopic Versus Open Restorative Proctocolectomy for Familial Adenomatous Polyposis. *J Laparoendosc Adv Surg Tech A* 2018;28:47-52.
  17. Sampietro GM, Colombo F, Frontali A, et al. Totally laparoscopic, multi-stage, restorative proctocolectomy for inflammatory bowel diseases. A prospective study on safety, efficacy and long-term results. *Dig Liver Dis* 2018;50:1283-91.
  18. Antolovic D, Kienle P, Knaebel HP, et al. Totally laparoscopic versus conventional ileoanal pouch procedure--design of a single-centre, expertise based randomised controlled trial to compare the laparoscopic and conventional surgical approach in patients undergoing primary elective restorative proctocolectomy--LapConPouch-Trial. *BMC Surg* 2006;6:13.
  19. Inada R, Nagasaka T, Kondo Y, et al. A Case-matched Comparative Study of Laparoscopic and Open Total Proctocolectomy for Ulcerative Colitis. *Acta Med Okayama* 2015;69:267-73.
  20. Michelassi F, Lee J, Rubin M, et al. Long-term functional results after ileal pouch anal restorative proctocolectomy for ulcerative colitis: a prospective observational study. *Ann Surg* 2003;238:433-41; discussion 442-5.
  21. Karlbom U, Lindfors A, Pahlman L. Long-term functional outcome after restorative proctocolectomy in patients with ulcerative colitis. *Colorectal Dis* 2012;14:977-84.
  22. Karlbom U, Raab Y, Ejerblad S, et al. Factors influencing the functional outcome of restorative proctocolectomy in ulcerative colitis. *Br J Surg* 2000;87:1401-8.
  23. Turina M, Pennington CJ, Kimberling J, et al. Chronic pouchitis after ileal pouch-anal anastomosis for ulcerative colitis: effect on quality of life. *J Gastrointest Surg* 2006;10:600-6.

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