39 Laparoscopic or open surgery for IBD?

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LEARNING POINTS

- Almost all colorectal procedures are feasible and safe when performed laparoscopically.
- The main advantage of laparoscopic surgery is superior cosmesis.
- Traditionally, short-term improvements, particularly reduced hospital stay and costs, are used as endpoints when comparing laparoscopic surgery with open surgery. This may need to be reassessed with the introduction of enhanced recovery programs.
- The true benefit of laparoscopic surgery compared to open surgery must be sought in long-term results e.g., reductions in recurrence rate in Crohn's disease, incisional hernia, postoperative adhesions, and postoperative infertility.

Introduction

Laparoscopic surgery for IBD is technically difficult in patients who have fragile tissue, thickened mesentery, dense adhesions, and skip lesions and in those who are malnourished or immunosuppressed. Despite these concerns, multiple early reports document advantages of laparoscopic surgery over open surgery for IBD. Laparoscopic surgery is performed more frequently for Crohn's disease (CD) than for ulcerative colitis (UC).

In recent years, advances in technology and surgical laparoscopic skills have lead to increased use of laparoscopic surgery in IBD including in more complex procedures.

Laparoscopy for Crohn's disease

Ileocolectomy

Although there have been few randomized controlled trials, multiple reports have shown advantages of laparoscopic ileocecal resection over open surgery for primary CD [1,2]. Milsom et al. [3] randomized 60 patients with ileocecal Crohn's to have laparoscopic surgery or open surgery: the laparoscopic surgery group had better postoperative pulmonary function, morbidity, and reduced length of stay. In addition, the laparoscopic surgery group had earlier return of bowel function, a finding replicated elsewhere [2,4]. Postoperative pain and analgesia requirements are also significantly reduced by laparoscopic surgery [4]. This enables earlier hospital discharge and reduced direct and indirect costs [1]. Performing ileocolectomy totally laparoscopically as compared to laparoscopy assisted, in which the bowel is mobilized laparoscopically and then delivered and resected extracorporeally, has no advantage and increases operating time and cost [5].

Other studies report that laparoscopic surgery reduces blood loss [6], wound infection, intra-abdominal abscess formation [1], and postoperative bowel obstruction [7]. However, most studies report only short-term outcomes and many of these may need to be reassessed with the increasing introduction of enhanced recovery programs, which enable quicker recovery of both laparoscopic surgery and open surgery patients.

In the future, studies will need to focus on the long-term benefits of laparoscopic surgery. The most obvious benefit is cosmesis [8], which is particularly important for young

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patients with CD. Data regarding both short- and long-term quality of life (QOL) following laparoscopic ileocolic resection for CD is surprisingly scarce. Although some studies found body image to correlate strongly with cosmesis, others report no difference in quality of life between laparoscopic surgery and open surgery patients [1,8].

With regard to recurrence of CD after primary resection, a meta-analysis reported reduced recurrence after laparoscopic surgery as compared to open surgery [7]. The meantime of recurrence was similar: 60 and 62 months, respectively. However, a more recent meta-analysis reported similar recurrence rates [9].

Conversion rates to an open procedure vary from 0 to 16.7% [10]. Risk factors for conversion are the indicators of more complex and hence more technically challenging disease. They include internal fistulae, a palpable mass, recurrent disease, smoking, steroids, extracecal colonic disease, and preoperative malnutrition. As surgical experience increases, it is likely that conversion rates will decrease. However, timely conversion to an open procedure should not be seen as a failure.

Small bowel resection and strictureplasty

This is a straightforward laparoscopic surgery procedure, but all of the small bowel must be assessed for coexisting strictures. This is usually done by "walking down the bowel" between two laparoscopic instruments.

Fecal diversion (stoma formation)

Fecal diversion by ileostomy or colostomy using laparoscopic surgery has the advantages reported above over open surgery, as no incision except for the stoma is made.

Colonic resection

Segmental colectomy for isolated disease, proctocolectolectomy for pancolitis or ileo-rectal anastomosis (synchronous or delayed) have all been performed by laparoscopic surgery. Although there are few reports in the literature, laparoscopic surgery appears to permit shorter hospital stay and quicker return to baseline partial and full activity and employment than open surgery [11]. In addition, in the short-term, recurrent disease requiring further surgery may be reduced after laparoscopic surgery compared to open surgery [11].

There are conflicting reports in the literature relating to operating time although it is generally agreed that laparoscopic surgery takes longer than open surgery.

Laparoscopic surgery for complex Crohn's disease

Complex CD, including recurrent disease, fistulae, abscesses, or phlegmon represents a challenge even for very experienced surgeons. Laparoscopic resections can be performed safely without unacceptable conversion rates. Factors that increase the conversion risk include: intraoperative intestinal injury and fistulating disease [12], particularly with duodenal or vaginal involvement. Importantly, conversion does not increase morbidity [12]. Conversion rates are greater in patients with an increased body mass index.

A successful initial laparoscopic resection for CD increases the likelihood that surgery for recurrent disease will also be possible laparoscopically and allows the benefits of laparoscopic surgery to be maintained [13].

Laparoscopy for ulcerative colitis

Experience with laparoscopic surgery for ulcerative colitis is less than that for Crohn's due to the complex nature of these procedures and the steep learning curve.

Subtotal colectomy and panproctocolectomy

Laparoscopic subtotal colectomy confers short term benefits over open surgery including reduced hospital stay, blood loss, and faster return of GI function, even in medically refractory acute severe colitis [2,14] but it has significantly longer operating times, which decrease with greater experience. Hand-assisted laparoscopic surgery, where one hand is inserted in the abdomen within a gas tight glove, enables reduced operative time with similar postoperative recovery and morbidity rates when compared to laparoscopically assisted surgery.

When laparoscopic total colectomy is performed as the initial stage of a three-stage restorative proctocolectomy, patients can proceed to subsequent restorative proctocolectomy and have their ileostomy closure done sooner than patients undergoing open surgery [15].

The arguments for laparoscopic panproctocolectomy are similar to those for ileal pouch-anal anastomosis.

Ileal pouch-anal anastomosis (IPAA)

Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) has evolved into the standard of care in selected patients with intractable ulcerative colitis. Laparoscopic surgery can be performed either in a totally laparoscopic fashion or hand assisted. Total laparoscopic IPAA has not been shown to have any significant short-term benefits over hand-assisted techniques [16]. Some surgeons perform the proctectomy through a small incision, whilst other prefer to perform it totally laparoscopically, which has been made possible by the recent development of laparoscopic angulated staplers to cross-staple the distal rectum. No data exists on the safety of this laparoscopic cross-stapling [17]. The pouch is usually formed extracorporeally.

Early series comparing IPAA by laparoscopic surgery compared to open surgery were very discouraging with a doubling of operating time, transfusion requirement and morbidity without reduction in hospital stay [17]. These results may reflect the learning curve for advanced laparoscopic surgery. A recent meta-analysis [18] concluded that laparoscopic IPAA resulted in reduced blood loss and hospital stay as compared with open surgery. However, a Cochrane review of 2009 [19] found no difference in mortality or morbidity between laparoscopic surgery and open surgery and significantly longer operating time for laparoscopic surgery than open surgery. It also reported no difference in pouch function with laparoscopic surgery or open surgery. Other recent studies have shown limited short-term advantages of laparoscopic surgery, despite increased operating time. It is possible that these differences would not have occurred if enhanced recovery protocols were used [17].

The main benefit of laparoscopic surgery is better cosmesis. When laparoscopic surgery was compared to open surgery, cosmesis was better in both sexes and body image was preserved, particularly in women. In the future, the true benefit of laparoscopic surgery for IPPA must focus on long-term outcomes. Recent evidence suggests that incisional herniae occur less frequently after laparoscopic surgery and that adhesion-related obstruction may be reduced [20]. In addition, the reduction in fertility seen after open surgery may be lesser when laparoscopic surgery is used. Future studies will need to assess sexual function after laparoscopic IPAA.

If these studies confirm the anticipated long-term benefits of laparoscopic surgery for IPAA, it will become the “gold standard,” particularly for young patients.

Conclusion

Numerous short-term advantages have been discussed for laparoscopic surgery as compared to open surgery for both CD and UC. However, the literature is lacking in quality randomized controlled trials. It will be interesting to see what effect, if any, enhanced recovery programs have on standard outcome measures such as return of gastrointestinal function and hospital stay; reported to be shorter with laparoscopic techniques. Nevertheless, laparoscopic surgery for these procedures is likely to be increasingly adopted with advantages outweighing any arguments about cost and operative time as experience increases and cohorts of surgeons trained in laparoscopic surgery at the onset of training become consultants.

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