

Case Report

Laparoscopic colorectal surgery: new paradigm towards excellence

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ABSTRACT

There is evidence accumulated that the laparoscopic approach is equivalent or superior to an open operation for a broad spectrum of colorectal procedures. Laparoscopic colectomy has been accepted late due to its technical complexity and favorable outcome. This is because of its steep learning curve, concerns with oncological outcomes, lack of randomized controlled trials (RCTs) and initial reports on port-site recurrence after curative resection. As the field continues to evolve surgeons are gaining increasing experience with more complex procedures, including total abdominal colectomies and low pelvic dissection. These advances expand the spectrum of indications that are appropriate for laparoscopic approach and the number of patients who potentially benefit from the technique.

Keywords: Laparoscopic, Colorectal, Colectomy, Randomized controlled trials, Pelvic dissection

INTRODUCTION

Laparoscopic colorectal surgery has done more now since its inception 30 years ago. Now almost 40-50% of all colorectal resection for both benign and malignant disease are done with laparoscopic modes.^{1,2} After the description of the holy plane for total mesorectal excision (TME) for rectal cancer, rectal resection has become more common and radicality of malignancy is also maintained.³⁻⁵ Since then, several landmark studies have confirmed equivalent, non-inferior or improved short and long term perioperative and oncologic outcomes of laparoscopy when compared to traditional open resection.⁶⁻¹² Laparoscopic MIS techniques have shown to result in earlier return of bowel function, earlier initiation of diet, shorter index hospitalization length of stay, decreased postoperative pain, and improved cosmetic results.^{7,13} With advancements in laparoscopic platforms, instruments, technical skill and early training during surgical residency, laparoscopy has become, in many instances, the default surgical approach for many surgeons within the abdominal cavity.

Table 1: Clinical classification of diverticulitis; adapted from Kohler et al.¹⁷

Grade	Clinical features	Symptoms
I	Symptomatic uncomplicated disease	Fever, abdominal pain, CT evidence of diverticulitis
II	Recurrent symptomatic disease	Recurrence of above symptoms
III	Complicated disease	GI bleeding
		Phlegmon
		Abscess
		Perforation-purulent/faecal peritonitis
		Stricture
		Fistula
		Obstruction

Diverticular disease of colon and its complications are very common problem in the western world. It is

especially common in elderly ladies, patients with constipation, obesity and diet poor in roughage. With increasing life expectancy, changing lifestyle and changing food habits; diverticulosis is now seen commonly in Indian population too. Diverticula can develop in any part of large intestine but are most common in the sigmoid colon. Complications are more common in sigmoid diverticula. Symptomatic patients may present with pain abdomen, tender abdominal lump, gastrointestinal bleeding. Patients may suffer from diverticular inflammation (diverticulitis) leading to an attack of acute abdominal pain. This may get complicated with a diverticular perforation followed by abscess formation in the abdomen or severe fecal contamination in the abdomen. The first laparoscopic colectomy was done in 1991, and laparoscopic colectomy for the treatment of diverticular disease either in an elective or emergency setting was feasible from 1996.^{15,16}

Table 2: Modified Hinchey classification; adapted from Wasvery et al.¹⁹

Classification	
0	Mild clinical diverticulitis
Ia	Confined pericolic inflammation-phlegmon
Ib	Confined pericolic abscess
II	Pelvic, intrabdominal or retrocolic abscess
III	Generalized purulent peritonitis
IV	Faecal peritonitis
Fistula	Colo-vesical/-vaginal/-enteric/-cutaneous
Obstruction	Large/small bowel obstruction

CASE REPORT

Case 1

A 48-year-old businessman from North India presented to us with h/o left lower quadrant pain abdomen for 15 days; following which patient noticed passing of gas bubbles while passing urine; he gave history of burning micturition but denied any history of blood in urine. He also had fever with chills for which he consulted a general physician who had advised broad spectrum antibiotics. He recovered from fever with the treatment but the pneumaturia persisted. Patient also had history of constipation for a long period of time for which he was on regular treatment. There was no other history of any comorbidity.

Patient was evaluated for these symptoms. CECT abdomen was done which revealed sigmoid diverticulosis with inflammatory phlegmon with colovesical fistula; cystoscopy confirmed the presence of fistula at the dome of the urinary bladder. Sigmoidoscopy also revealed presence of diverticuli in sigmoid colon.

Patient underwent laparoscopic dissection of colo-vesical fistula with separation of urinary bladder from sigmoid colon, urinary bladder repair with sigmoid colectomy with stapled colorectal anastomosis using circular stapler. Patient allowed liquids orally 1st day of surgery; abdomen drain removed 3rd day of surgery and discharged on 4th day.

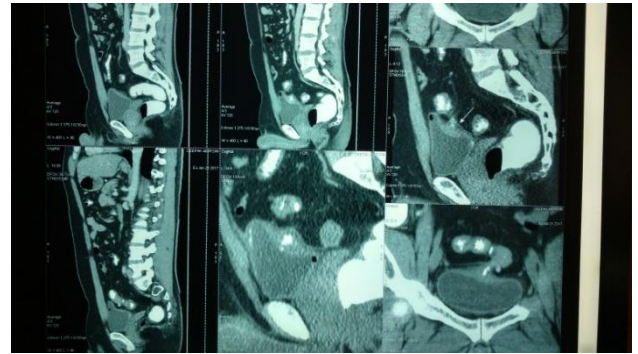


Figure 1: CECT abdomen showing colovesical fistula between sigmoid colon and dome of urinary bladder.

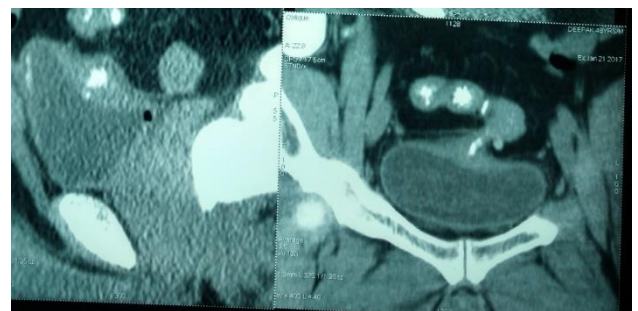


Figure 2: CECT abdomen showing colovesical fistula between sigmoid colon and dome of urinary bladder.

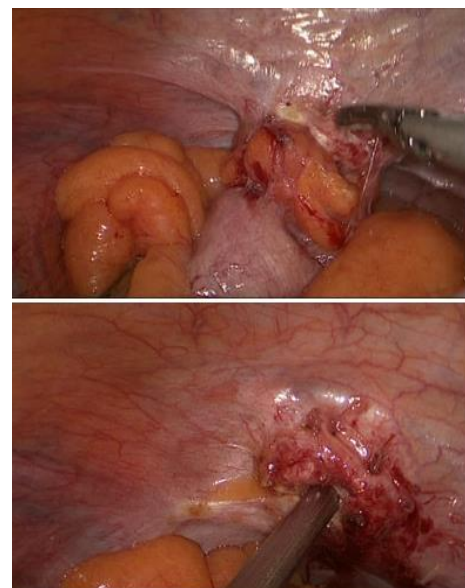


Figure 3: Operative photograph of colovesical fistula, photos showing fistulous opening at the dome of urinary bladder.

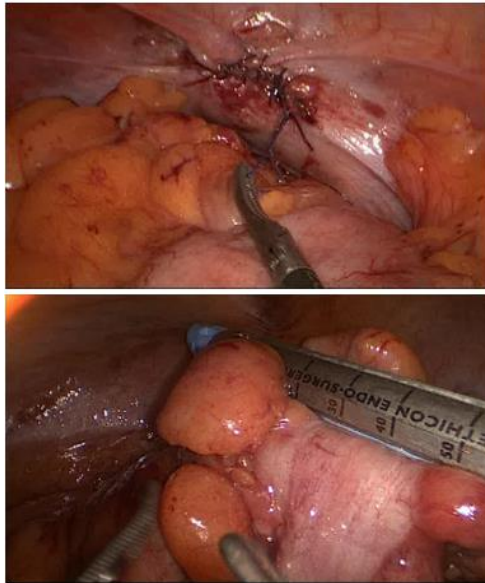


Figure 4: Operative photograph showing repaired urinary bladder and transection of sigmoid colon.

Case 2

Carcinoma sigmoid colon

A 53-year-old male presented with chief complaint of bleeding per rectum and constipation; h/o weight loss and anorexia present. Sigmoidoscopy show growth at recto-sigmoid junction, biopsy s/o adenocarcinoma; CECT show mass at the rectosigmoid colon and no distant metastases.



Figure 5: Operative photograph of dissection of superior rectal vessel for medial to lateral dissection in carcinoma rectosigmoid junction.

Patient underwent laparoscopic anterior resection; he was mobilized on the day of surgery and allowed clear liquids next day. He was discharged on 4th post-op day.

DISCUSSION

Following its introduction in the late 1980s, laparoscopic cholecystectomy rapidly became the standard of care; success with this procedure had led naturally to the application of minimally invasive techniques to other intra-abdominal organs. Evidence has accumulated that the laparoscopic approach provides outcomes that are

equivalent or in superior to an open operation for a broad spectrum of colorectal procedures.

Laparoscopic colorectal surgery (LCRS) dates back to 1991. In the 2nd decade since this initial experience was published by Jacob et al LRCs had become a standard of care for patients requiring a wide array of colon and rectal operations.¹⁵ The use of laparoscopy is gaining widespread acceptance and is used more frequently to manage both benign and malignant colorectal conditions. A large number of colorectal studies and meta-analyses have shown that LCRS is associated with the same benefits than other minimally invasive procedures, including lesser pain, earlier recovery of bowel transit and shorter hospital stay, a shorter duration of disability, and a much better cosmetic result. The surgery is less disruptive and more accurate because the operative field is magnified and the surgeon can manipulate the laparoscope to see areas difficult to visualize in open surgery. Because there is less incisional pain, there are fewer pulmonary problems postoperatively.^{20,21} On the other hand, despite initial concerns about oncological safety, well-designed prospective randomized multi centre trials have demonstrated that oncological outcome of laparoscopy and open surgery are similar.

It had also been suggested that the short term advantages of laparoscopy were related to decrease inflammatory response. Several studies had demonstrated lower serum levels of interleukin-6 and other proinflammatory cytokines, which were sensitive markers of tissue damage, after laparoscopic colectomy than after open resection.

Laparoscopic rectal and colon cancer

Despite the initial concerns regarding the oncological safety of the laparoscopic approach, well-designed prospective randomized multicenter trials have demonstrated no difference in the incidence of metastases in the surgical wound as well as in oncological outcomes when the laparoscopic approach was compared to open surgery. The use of laparoscopy for the management of colorectal cancer is currently accepted worldwide.

Laparoscopic surgery in inflammatory bowel disease

Despite it being technically demanding, several case-control studies and randomized trials have demonstrated that a laparoscope approach for ileocolic and also for colonic diseases is as effective as open surgery with many short-term benefits in Crohn's diseases. Laparoscopic surgery also has an evolving role in the management of ulcerative colitis and familial adenomatous polyposis (FAP). Total abdominal colectomy, proctocolectomy, ileoanal pouch-anal anastomosis (IPAA) are all feasible and can be formed safely by laparoscopic approach. A recent review of literature found longer operative times among patients

having a laparoscopic operation, but similar short-term and long-term outcomes.

Laparoscopic surgery in rectal prolapse

Several different transabdominal operations are widely used for rectal prolapse, including rectopexy, recto sigmoid resection, mesh fixation, and continuation thereof. Each of these components is technically feasible using a laparoscopic approach.

Laparoscopic surgery in diverticular disease

Minimally invasive surgical techniques are well employed in performing the spectrum of surgical procedures required for diverticular diseases. Sigmoid colectomy, left colectomy and diverting ileostomy/colostomy are all eminently feasible in most cases. Fistulas between the sigmoid colon and skin, bladder, uterus or vagina are rare but do not represent a contraindication to laparoscopic approach.

The most common of these fistulas-colovesical fistulas required only minimal dissection to separate the sigmoid colon from the bladder, followed by bladder decompression with a foley's catheter for 5 to 7 days to allow healing. Preoperative or intra operative urethral stent placement may be helpful in selected cases. A combination of lateral to medial and medial to lateral techniques also may be helpful. More recently laparoscopic lavage and placement of drains has been used in the treatment of complicated diverticulitis like diverticulitis without fecal peritonitis.

CONCLUSION

Evidence has accumulated that the laparoscopic approach provides outcomes that are equivalent or superior to an open operation for a board spectrum of colorectal procedures. The benefits of minimal invasive technique for colorectal surgery can be extended to larger section of population by proper preoperative selection of patients.

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