

LAPAROSCOPIC SIGMOIDECTOMY FOR COLONIC DIVERTICULAR DISEASE – CASE REPORT

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LAPAROSCOPIC SIGMOIDECTOMY FOR COLONIC DIVERTICULAR DISEASE – CASE REPORT (Abstract):

The aim of this presentation is to show the feasibility of resection and stapled anastomosis using laparoscopic technique. *Material and method:* A 48 years old male was admitted in our clinic with a colonoscopic diagnosis of diverticular disease limited to the sigmoid colon. The symptoms included abdominal pain in the left lower quadrant, vomiting and flatulence lasting for a couple of months. The operation started with laparoscopic diagnosis, followed by the insertion of the additional trocars. We dissected the sigmoid mesentery using by-polar cautery, followed by transection of the recto-sigmoid junction with a linear laparoscopic stapler. Resection of the colon was completed outside the abdomen and the operation was finished using a transanal stapled colorectal anastomosis, inside the abdomen, under laparoscopic control. *Results:* The recovery of the case was simple, painless, without wound infection or abdominal sepsis, early mobilization and return to full activity.

KEY WORDS: COLON, DIVERTICULAR DISEASE, LAPAROSCOPY

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INTRODUCTION

Laparoscopic colorectal procedures are mostly performed for non-malignant diseases. There are some authors [1-4] who reported series with laparoscopic resection for malignancies (palliative or radical resections).

MATERIAL AND METHOD

Our case is the first one who was operated in Iași using stapled anastomosis in a laparoscopic approach. A man, D.V., 48 years old, from Iași was admitted for abdominal pain in left lower quadrant and vomiting lasting for a couple of months.

Clinical evaluation and colonoscopy in the Institute of Gastroenterology and Hepatology demonstrated a short segment colonic diverticular disease and a colonic polyp (35 cm from the anal verge) which was endoscopically resected. The patient also presented second degree reflux esophagitis hepatic steatosis, moderate obesity and internal hemorrhoids. A short course of symptomatic therapy proved non-beneficial for the patient.

Thus he was admitted in our clinic for laparoscopic colonic resection. The operation was performed under general anesthesia with the patient in the lithotomy position, with the operator on the right side. The first stage of the operation was laparoscopic inspection of the abdominal cavity. The working trocars were introduced in the left and right midclavicular line – paraumbilical and below, according to sigmoid colon anatomy and position (the sigmoid colon was large and fatty). We divided the line of Toldt for separation of the colon from abdominal wall in order to mobilize the left colon for future colo-rectal anastomosis (Fig. 1). We transected the sigmoid mesentery with by-polar cautery and scissors (without clips or ligature) close to sigmoid wall, with significant difficulty because fat obstructed direct view of vascular anatomy. A linear laparoscopic stapler was used to transect the colon at the recto-sigmoid junction (Fig. 2).

The colon was pulled outside the abdomen through a small separate incision (5 cm) in the left lower quadrant and transected using open technique. The recto-colic anastomosis was finished inside the abdomen using a transanal circular stapler under laparoscopic assistance. The abdominal cavity was washed and drained laparoscopically (Fig. 3) and the operation was finished with the closure of the abdominal wounds.

RESULTS

The operative time was 190 minutes. Recovery was simple although the patient spent three days in ICU for surveillance. Postoperative antibiotic prophylaxis included Sulperazone and

Metronidazol for 5 days. Postoperative pain was minimal and the patient returned to normal oral intake 6 days post-operative. The drainage was removed in the 7th post-operative day when the patient was discharged free of symptoms. The patient remained free of symptoms during the following check-ups.

We believe it was a successful management of a difficult case, that would have raised serious problem in open surgical technique. We wish to underline the importance of the stapplers which made this operation possible.

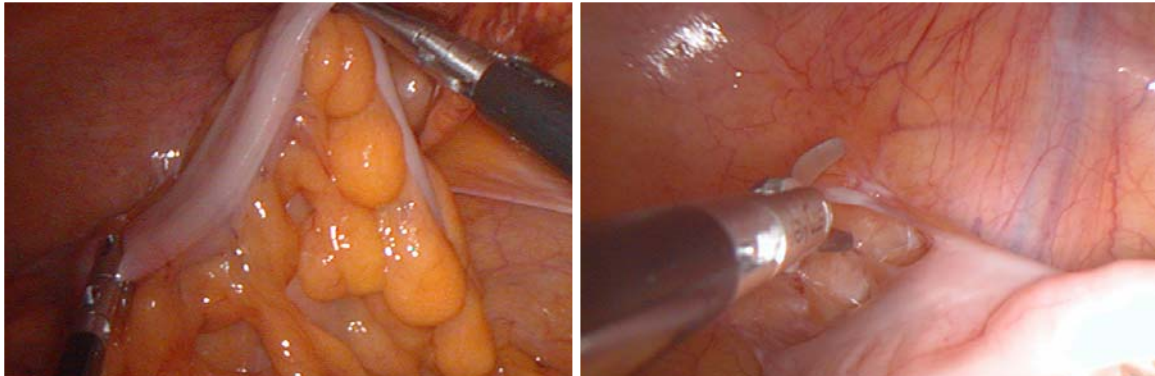


Fig. 1: Mobilization of the left colon

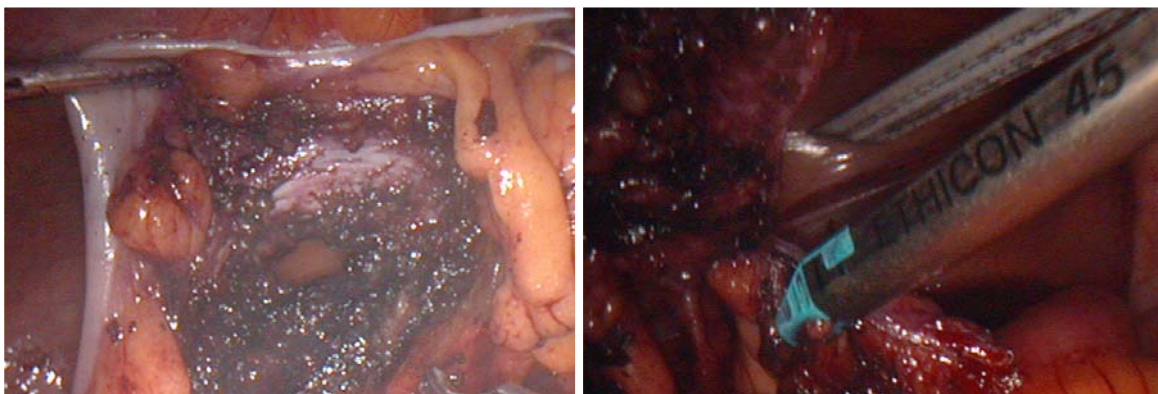


Fig. 2: Dissection of the mesosigmoid and transection with linear laparoscopic stapler the rectosigmoid

DISCUSSION

In the 19th century colonic diverticular disease was a surgical curiosity for authors like: Cruveilhier, Rokitansky, Cripps, Virchow. In the 20th century the disease became endemic in Western Europe, in US it is found in 50% of persons 60 years old, but less than 10% had symptoms, and a few of them need to be operated upon [1]. Diverticuli occurs most commonly on the anti-mesenteric surface of the bowel, usually in the sigmoid colon, between the teniae at the points where the blood vessels penetrate the wall, weakening the muscles. The diverticuli becoming manifest as a result of high intracolonic pressure. Motor studies in patients with diverticular disease reveal an exaggerated response to pharmacologic stimuli, increasing intraluminal pressures, faster frequency waves and rapid contractions (more than 5 minutes). According to the law of Laplace, the tension in the wall of a cylinder is proportional to its radius multiplied by pressure within the cylinder. The elasticity of the colonic wall decreases with age, mostly on the left side [1]. Cortesini and all demonstrated a high intraluminal pressure into the bowel lumen of individuals with symptomatic diverticular disease. Microscopically diverticuli has just mucous and peritoneal layers.

Painter and Burkitt incriminate the alimentary factor -low in fibers- for the increase of diverticular disease in the last 100 years. Gear and all using barium enema studies reported 12% diverticular disease in vegetarians and 13% in non-vegetarians.

The symptoms of diverticular disease are similar to those encountered in irritable bowel syndrome (one fifth of a the general population has abdominal pain more then six times a year in UK (1/4 in USA). Out of this population Havia and Manner reported 24% with diverticular disease. Pain varies in intensity and duration and is frequently associated with heartburn, indigestion, bloating, nausea. Typical cases present without fever, leukocytosis or peritoneal irritation, despite complications. An abdominal mass might be felt in the left lower quadrant. Patients with diverticular disease often mention urinary problems (dysuria, urgency, nicturia). Inflammatory complications may associate fever, rectal bleeding, tenderness suggesting an intra-or extra-peritoneal perforation.

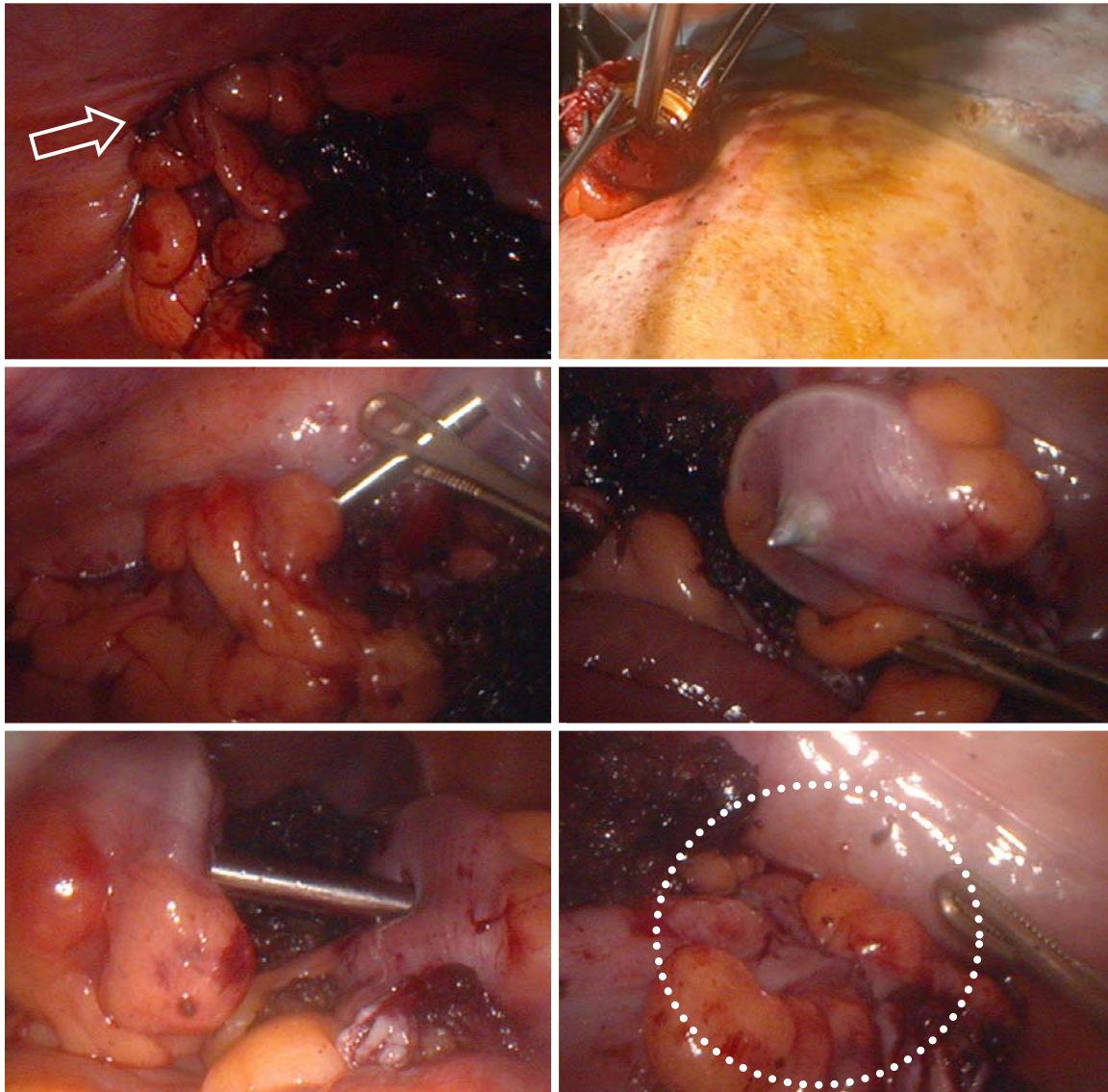


Fig. 3: Outside resection of the sigmoid and recto-colic anastomosis inside the abdomen by transanal circular stappler

Evaluation of diverticular disease is straightforward once the supposition arises. Colonoscopy should demonstrate diverticuli and also exclude other conditions (ischemic colitis, carcinoma, inflammatory bowel disease, Crohn` disease, ulcerative colitis). Probably the most valuable evaluation is represented by barium enema (Fig. 4). Some authors suggested that computed tomography has a superior definition of the bowel wall thickness and the extent of extra luminal disease. Ultrasound has a high sensitivity (97,7% - Schwerk) in the diagnosis of acute and complicated diverticulitis.

Treatment of uncomplicated cases remains mostly conservative. In acute episodes therapy is based on a low residue diet and broad spectrum antibiotics for 10 days. If major complications occur (intestinal obstruction, perforation, abscess or fistula formation) surgical treatment is advisable. Surgical treatment for colonic diverticular disease varies from colostomy to resection of the involved segment with or without primary anastomosis. In 1907 Mayo, Rankin, Brown, Smithwick recommended lateral transverse colostomy and drainage of infected area in acute diverticulitis. In 1980 Thompson stated that any perforation should be sutured and covered with adjacent appendix epiploica followed by a transverse colostomy. Simple colostomy and drainage was associated with a 40% mortality in Alexander Williams's experience. Greif reported a 2% operative mortality in patients treated by resection and colostomy compared with a 12% operative mortality for those with colostomy only. Classen reported that the three stages operation for perforated diverticulitis gave a 8.5% mortality after the first stage, 0.7% after the second stage and 4% after the third stage, with an overall mortality of 11%. Madden and Tan, in 1961, introduced primary resection and anastomosis without colostomy. Farkouh performed this operation on 15 patients with no fecal contamination, with low mortality (one case) and morbidity (one case with anastomotic leak). In 1984, Ger and Ravo, presented an experimental technique for a safe colorectal anastomosis without transverse colostomy even in a present of massive contamination, by means of implanted latex silastic sheeting within the lumen of colon -"intracolonic bypass"-, with good results in the first ten patients. In 1964, Reilly recommend longitudinal sigmoid myotomy at the antimesenteric taenia in and in 1973 Hodgson proposed transversal myotomy at the two antimesenteric taenia.

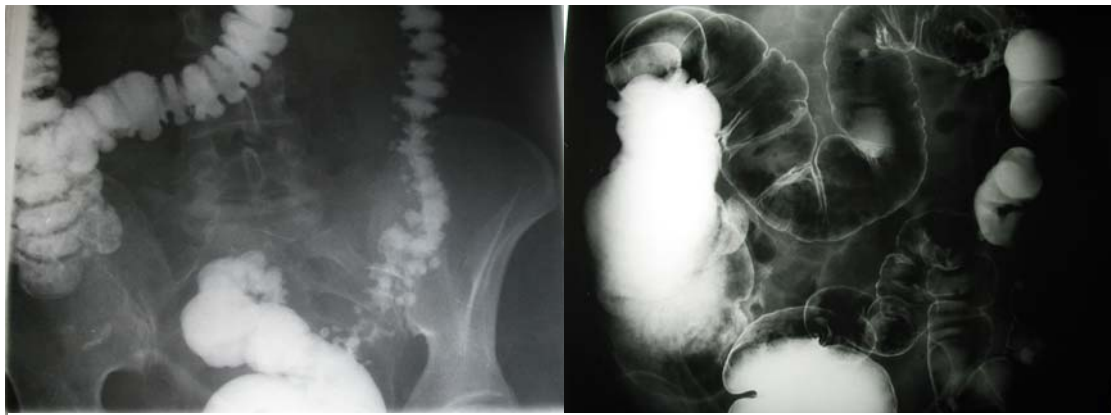


Fig. 4: Barium enema examination

The laparoscopic technique reduces the parietal aggression and achieves the same results as traditional surgery. Patients recover faster and experience less pain, with fewer wound infections, post operative hernias, less time in hospital and reduced costs. But laparoscopic colonic surgery requires extensive and highly specialized training, with few surgeons qualified to perform these procedures [2]. The procedure requires a short preoperative preparation. The day before the patient meet with anesthesiologist and is started on a clear liquids diet. Oral antibiotics may be considered. The patient may be admitted into the hospital in the morning of the laparoscopic procedure. After operation, in a day or two, the patient should be able to drink liquids; on the third day he or she may eat some solid foods. In a week the patient is able to take care himself and to go home. [2]

Historical data:

Moises Jacobs, from Miami, was the first to perform a laparoscopic colectomy with extracorporeal anastomosis in 1990. In the same year Joseph Uddo performed a laparoscopic Hartmann's revision with a circular stapled anastomosis [2]. The introduction of Endo – GIA stapler allowed the transection of the bowel inside the abdominal cavity. Dennis Fowler performed the first sigmoid resection in October 1990. Patrick Leahy, in 1990, resected a rectal cancer with

low anastomosis. On 26th July 1991, Joseph Uddo performed an entire laparoscopic right hemicolectomy with intracorporeal ileo-colic anastomosis. In 1991, Sacharides reported laparoscopic removal of a colonic lipoma and other small tumors which was not resectable by endoscopy. The biggest issue concerns the safety of laparoscopic colectomy for malignancy. The Society of American Gastrointestinal Endoscopic Surgeons (SAGES) issued policy statements regarding privileging [3].

Obesity adds risks and frequently laparoscopic technique is suggested to reduce postoperative complications. Surgery in obese patients carry high risks of wound complications, cardiopulmonary complications and these patients are notorious for the high incidence of commorbide conditions. Because laparoscopic colectomy requires mobilization of large lengths of mesentery, obesity is a key risk for conversion, for operative time and for side effects (pulmonary complications, anastomotic leak, postoperative ileus. [4]

Operative technique:

Resection technique for sigmoid diverticular disease starts with insertion of trocars – first at 3-4 cm above the umbilicus for scope, the second on the right midclavicular line, at the same level with the umbilical scar, the third trocar 8-10 cm below the second. These last two trocars are 5mm in size and are the operative trocars. Additional 5 mm trocars can be used for mobilization and exposure of the colon (left midclavicular line, suprapubic in the midline; on the right midclavicular line below costal margin).

The first time is laparoscopic exploration and preparation of the operative field. The omentum is retracted in the right upper quadrant. The small bowel is retracted the right lower quadrant. Patient is placed in Trendelenburg position and tilted on the right to help with exposure. The exposure continues with the sigmoid colon and mesentery. Dissection starts with the peritoneum along the aorta, to the origin of the inferior mesenteric artery using cautery or a harmonic scalpel. Vascular division preserves the left colic artery and a variety of methods can be used to achieve that (harmonic scalpel, Ligasure, intracorporeal knots or a vascular stapler). The inferior mesenteric vein is divided in a similar fashion. Dissection of the Told's fascia is started from the midline, living the iliac vessels, ureter, nervous trunks and kidney in a posterior plane.

Left colon and splenic flexure are mobilized using cautery, harmonic scalpel or Ligasure. Division of the mesorectum is followed by division of the colorectal junction using an Endo-GIA stapler. Sometimes a second application is necessary. It is better to use two small stapplers instead of a long one. Colonic resection is made outside the abdomen using a separate incision. The anvil of the stapler (at least 29 mm) is introduced, fixed and the colon is introduced back into the abdomen. The abdominal cavity is inflated again, the rectal stump is perforated with the tip of a circular stapler, introduced through the anus. The stapling device is closed with great care to prevent rotation of the bowel, tension in the anastomosis or tissue being retained between stumps. The stappled line is checked visually and with gas introduced in the rectum No drains are necessary.

CONCLUSIONS

Sigmoidectomy for diverticular disease and diverticulitis are often difficult to perform because of inflammatory changes and large fatty sigmoid mesentery. Laparoscopic technique is an excellent approach though not yet the gold standard. A smooth performance of this technique depends on: the quality of the equipment; perfect knowledge of the operative steps; exposure of operative field; the experience of the surgical team.

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