The Laparoscopic Approach
in the Treatment of Diverticular Colon Disease

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ABSTRACT

Background and Objectives: The experience with treatment of diverticular colon disease (DCD) by the laparoscopic method is analyzed.

Methods: Between January 1994 and July 1997, a group of 22 patients with criteria for symptomatic diverticular disease in the descending and sigmoid colon underwent laparoscopy with average resections of 40 cm. Intra-abdominal mechanical anastomosis completed the procedure.

Results: The operative morbidity was 28%. Two cases, in acute diverticulitis phase, were reconverted to open surgery, and three cases presented postoperative rectorrhagia which ceased spontaneously. No long-term complications have been found. Postoperative hospitalization was 4-8 days (mean 5.5) and mean operative time was 165 minutes (range 120-240).

Conclusions: Nevertheless, the learning curve precise to practice this type of surgery, the acceptable morbidity-mortality rates which the laparoscopic method presents, especially with these high-risk groups of patients (age > 65, high blood pressure, etc.), encouraged us to modified the criteria indicating surgery for the disease, offering first choice operative treatment with efficiency and safety. However, we feel that those patients with acute complications of diverticular colon disease must be excluded initially for laparoscopic approach.

Key Words: Laparoscopy, Diverticular colon disease.

INTRODUCTION

Laparoscopic colon resection was introduced in 1990 for cancer and inflammatory processes.1 Lately, the use of laparoscopy in the management of colorectal carcinoma has become controversial because of reported metastatic implants in the port sites.2 But, in benign colorectal diseases, this approach is becoming an option due to the advantages of laparoscopic access.3

Diverticular colon disease (DCD) has traditionally been treated with conservative procedures, leaving surgery for the acute phase and its complications. However, the incorporation of the laparoscopic approach and the reduction of morbidity-mortality with this technique is leading to a reconsideration of the need to increase surgical indications in the chronic diverticulosis phase of the disease.4

Symptomatic diverticular disease is accompanied by pain, rectorrhagia, intestinal transit alterations and pseudo-obstruction crisis. Surgical treatment by laparoscopic approach can be safely considered initially, without having to wait to operate on these processes in the acute phase.

The indications for elective surgery in DCD has been postulated classically as recurrent acute diverticulitis, associated fistula, second-stage procedure after initial emergency surgery, immunosuppressive therapy, etc.5

The symptomatic DCD with abdominal pain, rectorrhagia, intestinal transit alterations and pseudo-obstruction, will always be considered causes for surgery.6

MATERIAL AND METHODS

Between January 1994 and July 1997, a group of 22 patients with criteria of symptomatic diverticular disease underwent surgical treatment by laparoscopic approach. The average age was 66 (range 48-83), the majority being women (15/7). Considering the group's high average age, the presence of three or more risk factors (high blood pressure, diabetes, chronic pulmonary disease (CPD), coronary ischemia, etc.) or the existence of prior abdominal pathology was predominant (Table 1).

Surgical indications are summarized in Table 2. Antibiotic and thromboembolic disease prophylaxis and mechanical colon cleaning with Bhöm solution were performed in all cases.
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Table 1. Risk factors.

| Risk Factor       | Count (Percentage) |
|-------------------|--------------------|
| Age > 65 years old| 18 (82%)           |
| High blood pressure| 16 (73%)          |
| CPD               | 10 (45%)           |
| Diabetes          | 8 (36%)            |
| Cardiopathy       | 8 (36%)            |
| Tobacco           | 8 (36%)            |
| Obesity           | 8 (36%)            |
| Anemia            | 7 (32%)            |
| Cirrhosis         | 2 (9%)             |

The laparoscopy was performed with four trocars (Figure 1). The port located in the left subcostal space (10 mm) was enlarged to 5-6 cm for the extraction of the surgical piece and to insert the head of the stapler for digestive continuity reconstruction, avoiding the necessity of a new minilaparotomy in the left lower quadrant.

All the resections affected the descending and sigmoid colon. Average resection length was 40 cm (range, 25-50), mobilization of the splenic angle being necessary to a greater or lesser degree.

In eight patients a lysis of adhesions from previous open surgery was carried out. Anastomosis was performed extracorporeally with biodegradable ring (Valtrac) in the first two cases. All the other cases received intracorporeally colorectal anastomosis, with CEEA surgical stapler, no. 28-31 (USSC, Norwalk, CT, USA), introduced transanally.

Mesenteric vessel ligature was performed as the first surgical maneuver with clips or the EndoGIA-30 (USSC) vascular staples. The mesocolon was transected freeing the colon segment. After this dissection, the left ureter was identified.

The most distal part of descending colon and proximal rectum were then mobilized. The former was cut with the endostapler (EndoGIA blue, USSC) at the promontorium level. The anvil was introduced into the proximal segment of colon and secured. After its return into the abdomen and closure of the wound, a double-stapled anastomosis was performed. The anastomosis was checked filling the pelvis with saline solution and injecting air into the rectum. The abdomen was drained with a pelvic drainage (48-72 hours) in all cases.

**RESULTS**

The procedure was converted to a median laparotomy in two patients with sigmoid plastron in peridiverticulitis phase, which made mobilization by laparoscopy especially difficult.

With respect to early complications, three patients presented persistent postoperative rectorrhagia during the first 72 hours, which disappeared spontaneously, probably secondary to a forced maneuver during stapler introduction. One 83-year-old patient was reoperated on the fourth day for jejunal perforation, whose origin could not be established but may be attributed to electrosurgical coagulation burn. There were no anastomosis complications. One wound infection (at the level of minilaparotomy) was observed. No later complications related to the surgical procedure appeared.

The mean operating time was 150 min. (range 120-240). In the first ten patients, the time was between 3-4 hours and in the last 12 patients, 2-3 hours. Bowel activity resumed in the first 48-72 hours postoperatively, and oral intake began between the third and fourth day. The mean hospital stay was 5.5 (range 4-8), except for those patients needing laparotomy (12-15 days). There has been no postoperative mortality.

**DISCUSSION**

The laparoscopic sigmoid resection in uncomplicated diverticulitis is a technically feasible procedure in spite of the complexity of this inflammatory process. The more acute the presentation of diverticular colon disease (peridiverticulitis, phlegmon, free perforation or pericolic abscess), the more debatable the role of laparoscopic surgery in its treatment becomes. There have been a few reported successes of the laparoscopic approach in sigmoid diverticulitis with perforation or even peritonitis. However, our experience has been negative in cases operated on in the acute phase, as sepsis and involvement of the surgical specimen in the inflammatory mass made conversion necessary.
However, in chronic diverticular colon disease with crisis of pain, hemorrhage, pseudo-obstruction, recurrent acute episodes or diarrhea, a laparoscopic approach can be the technique of choice due to its efficiency and moderate morbidity-mortality compared with conventional surgery.\(^4,7,10,11\)

This is especially so, considering the high average age of patients with this pathology.\(^12\) However, it is important to point out that this is a complicated surgery, in which the thick, hypervasculated mesocolon and the inflammatory character of the diseased colon add further difficulties to a surgery in which the learning curve cannot be ignored.\(^13\)

In relation to the technique, in our opinion, it seems best to ligate and section the mesenteric vessels initially, as this will facilitate the later liberation of the mesocolon and the opening of the first transmesocolonic window.\(^14\) Likewise, it is essential to identify the left ureter and continue the intestinal liberation to the zone totally diverticula free, which usually coincides with the peritoneal reflection level.

Freeing distal colon fat can be performed correctly by laparoscopy and is fundamental to maintaining the integrity of the colorectal anastomosis. An excessively long distal end can leave diverticula which prevent adequate penetration of the circular stapler, thus obliging a termino-lateral anastomosis.

The absence of a wide laparotomic incision, the rapid restoration of intestinal transit, early mobilization and decrease of postoperative pain give this technique morbidity-mortality figures so acceptable for these high-risk patients that the criteria for surgery in the disease have been modified. However, we think that acute diverticulitis disease must be excluded for laparoscopic approach.

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