

Laparoscopic surgery in acute small bowel obstruction. Our experience

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SUMMARY: Laparoscopic surgery in acute small bowel obstruction. Our experience.

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Small bowel obstruction (SBO) is a very common condition, in the vast majority of cases caused by post-operative adhesions. It often requires surgical treatment. Traditionally, this consisted of a laparotomy, but nowadays a laparoscopic approach is also possible.

This study discusses 24 cases of SBO and compares them with literature data. Successful complete laparoscopic treatment was feasible in 9 patients, while conversion to laparoscopically-assisted surgery or laparotomy was required for the others.

RIASSUNTO: La laparoscopia nelle occlusioni intestinali acute del tenue. Nostra esperienza.

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L'occlusione intestinale del tenue è una condizione clinica di assai frequente riscontro e le aderenze postoperatorie ne rappresentano certamente la causa più frequente; il trattamento chirurgico si avvale oggi della possibilità di un approccio anche laparoscopico.

Scopo di questo studio è confrontare i risultati da noi ottenuti nella chirurgia open vs laparoscopica dell'occlusione intestinale e con i dati della letteratura. Nella nostra casistica abbiamo considerato 24 pazienti affetti da occlusione intestinale del tenue e trattati chirurgicamente con approccio miniminvasivo: in nove casi l'intervento è stato portato a termine per via laparoscopica, mentre negli altri casi è stata necessaria una conversione.

KEY WORDS: Bowel obstruction - Laparoscopic surgery.
Occlusione intestinale - Chirurgia laparoscopica.

Introduction

Acute bowel obstruction is the cause of abdominal pain in 15% of patients (1) admitted for surgery and often requires urgent surgical intervention. In 83.2% of cases it is secondary to post-operative adhesions, while hernias are the cause in 3.1% and cancer in 2.9% (2,3).

Bowel obstruction was once considered a contraindication to laparoscopic surgery due to the high risk of iatrogenic injuries and the poor view permitted by the distended bowel loops (2). However, improved surgical techniques and the increased availability of new surgical instruments have encouraged the use of a minimal-

ly invasive approach (4). The most recent EAES (European Association for Endoscopic Surgery) guidelines confirm the safety of this approach with the Hassan technique for the treatment of radiologically and clinically diagnosed acute bowel obstruction not improved with conservative management (5).

We report our experience in the minimally invasive treatment of small bowel obstruction, discussing our results in terms of etiology, duration of the surgical procedure, length of hospitalization, conversion rate, and morbidity.

Patients and methods

Between 2004 and 2009 24 patients (15 female, 9 male, age 34-76 years, mean 55) underwent laparoscopic surgery for small bowel obstruction. In this retrospective analysis we excluded patients who had undergone previous abdominal surgery, patients with a high grade of intestinal distention, patients with a colorectal occlusion and patients who had obstructing cancer.

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The obstruction was due to adhesions in 18 cases, with 12 having a single adhesion and 6 multiple adhesions. 3 patients had an internal hernia, 2 had adhesions secondary to Crohn's disease and 1 had gallstone ileus. In patients whose bowel obstruction was caused by a single band, the surgical history was positive for appendectomy in 5 cases, hysterectomy in 3 cases, cholecystectomy in 2 cases, oophorectomy in 1 case and c-section in 1 case.

Laparoscopy was possible in 9 out of 24 patients (40%), while conversion to an open procedure was necessary in the remaining 15 (60%). In 9 of these, conversion was required due to multiple adhesions, Crohn's disease or gallstone ileus. A laparoscopically-assisted approach was used in the remaining 6 patients, of whom 5 underwent ischemic bowel resection and 1 a repair of iatrogenic intestinal perforation (this patient had an intestinal occlusion secondary to multiple adhesions).

In the patients treated with laparoscopy, the operating time was 85 ± 20 minutes (range 65-105) and duration of hospitalization was 4 ± 2 days (range 2-6). In the cases converted to open surgery the operating time was 130 ± 30 minutes (range 100-160) and duration of hospitalization was 6 ± 2 days (range 4-8).

With the exception of the patient requiring conversion to an open approach due to an iatrogenic injury, who was discharged on postoperative day 6 after an uneventful postoperative course, there were no intraoperative or postoperative complications in either treatment group.

Discussion

According to a recent Swiss study, 35% of all patients undergoing a laparotomy will develop small bowel obstruction within 10 years, and 2-5% will need surgery for lysis of adhesions (6). The financial cost of this complication is high: in a Dutch study, it was estimated that small bowel obstruction secondary to adhesions costs the national healthcare system €57,000 Euro per 100,000 inhabitants a year (7), whereas in the UK it is estimated as around £500 million every 10 years (8).

In addition to the high costs, the long-term results of open lysis of adhesions are less than desirable, with recurrences of around 18% within 10 years and 29% within 30 years (2). This technique is also associated with prolonged postoperative pain, morbidity, reduced lung function and longer hospitalization (3,9).

In contrast, a minimally invasive approach has several advantages: reduced postoperative pain, blood loss, wound infection, and postoperative ileus, and shorter hospitalization (7,9-11). There also seem to be fewer postoperative adhesions (12,13), and thus a lower recurrence rate than with open surgery (14). Finally, laparoscopy often enables complete diagnosis in cases when imaging procedures have not revealed the cause of the obstruction (11,15,16).

A recent review of 19 studies (2) calculated a success rate of 55% for laparoscopy in the treatment of small bowel obstruction. Conversion to an open procedure was required in 33.5% of cases. The reasons for conversion were dense adhesions (27.7%), bowel resection (23.1%), unidentifiable cause (13%), iatrogenic injury (10.2%),

cancer (7.4%), poor exposure (4.2%), hernia (3.2%), and other (11.1%). Hand-assisted procedures with an incision of less than 10 cm were not considered as conversions. The indications for a hand-assisted technique were doubtful viable bowel, iatrogenic injury, and need for intestinal anastomosis (15,17,18).

Another study of 46 patients who had undergone laparoscopic lysis of adhesions (19) reported conversion to minilaparotomy in 2.2% of cases and conversion to an open procedure in 6.5%. The procedure was completed by laparoscopy in 91.3% of cases with no intra- or postoperative complications, and 93.5% of patients were asymptomatic at a median follow-up of 46.5 months. The authors attributed the efficacy and safety of the procedure to careful selection of patients. In fact, only 13% had dense adhesions and the cohort excluded patients whose obstruction was caused by cancer.

Single adhesions are often secondary to a previous appendectomy (4,9,17,20-24) and can cause small bowel obstruction (44%). Both these and adhesions following cholecystectomies (6) can be treated safely and successfully with laparoscopy. The presence of multiple dense adhesions increases the risk of iatrogenic perforations (17,22), especially upon insertion of the first trocar or during manipulation of the bowel loops. Smaller perforations can be repaired laparoscopically but in most cases a conversion to a laparoscopically-assisted or open procedure is advisable (2,6,10). In the latter case an increase in postoperative morbidity and duration of hospitalization is inevitable. Obviously, this is also true for patients requiring a second operation because an intra-operative injury was overlooked.

Careful selection is needed to ensure that patients will benefit from a laparoscopic approach. The following factors have been reported as increasing the need for conversion: more than 2 previous surgical procedures, bowel obstruction for more than 24 hours, bowel diameter greater than 4 cm on X-ray (5,11). In addition, laparoscopy is contraindicated in cases of peritonitis, peritoneal carcinomatosis, dense adhesions, bowel ischemia requiring intestinal resection, and high anesthetic risk (10,25).

To increase the safety of the laparoscopic approach (2,4,8,17,22,26,27) it is advisable to limit use of monopolar electrocautery as far as possible, use atraumatic graspers, taking care to grip the bowel loop and leave free the mesentery, improve exposure by adjusting the patient's position, and limit dissection to the loops responsible for the occlusion and any loops restricting the view of the operative field. As mentioned above, an open Hassan technique (6,16,19) is preferable for more dense adhesions identified by preoperative ultrasound mapping; in such cases, the trocars should be placed away from the surgical scars and the site of adhesions.

Conclusions

The use of laparoscopy to treat small bowel obstruction is limited by the difficulty in creating an adequate space among the distended bowel loops. (2,20). This, together with the difficulty in handling the loops without causing injury, is responsible for the high rate of conversion to open surgery (6-50%) (6,11) and incidence of iatrogenic intestinal injuries (3-26.9%) (6,7,19). However, its success and safety can be impro-

ved by careful patient selection according to radiological and clinical data (1,28).

Laparoscopy offers considerable benefits over open surgery: fewer postoperative adhesions, shorter hospitalization, reduced operating time, reduced postoperative pain, and reduced morbidity and mortality, provided that an adequate surgical technique is used. The decision on whether or not to subsequently convert to an open or laparoscopically-assisted approach depends on the surgeon's skills and intraoperative variables (11).

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