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Laparoscopic repair of small bowel and colon

A report of 26 cases

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Summary. This is a retrospective review of laparoscopic repair for enterotomies created during therapeutic or diagnostic laparoscopy in 26 women. All patients had mechanical and antibiotic bowel preparation preoperatively. The indication for operative laparoscopy was endometriosis (18), severe abdominal adhesive disease (7), and adhesions with Crohn's disease (1). Enterotomies were secondary either to CO_2 laser vaporization or excision of endometriosis and/or lysis of adhesions (23) and trocar insertion (3). The injuries included small-bowel enterotomies (9), colotomies (4), and rectotomies (13). No clinical complications related to enterotomy repair were noted. Twenty-three patients were discharged 1 day after surgery; one was discharged on postoperative day 2; and two were discharged on postoperative day 3. We concluded that small- and large-bowel enterotomies can be repaired safely via the laparoscope with minimum morbidity in patients with prepared bowel.

Key words: Small bowel – Colon – Enterotomy – Laparoscope – Operative laparoscopy

While gynecologists have used laparoscopic surgery extensively for over a decade [4–11], it has only recently been widely used by general surgeons. As general surgeons gain experience with laparoscopic techniques, we are witnessing the application of laparoscopic surgery to an increasing number of general surgical procedures [2]. While laparoscopy has been shown to diminish pain, scarring [4, 12], and hospitalization compared to similar open surgical procedures, the morbidity and efficacy of laparoscopic surgery when first applied as an alternative to an accepted open surgical procedure is speculative [13]. To help determine these risks we can often use the data accumulated during surgery for gynecologic pathology.

In this study, we review enterotomies of the small bowel, colon, and rectum created during elective diagnostic and therapeutic laparoscopy performed primarily for gynecologic pathology, and repaired by laparoscopic suture techniques. Our intent is to ascertain the efficacy and safety in prepared bowel for laparoscopic enterotomy repair.

Materials and methods

Twenty-six women (mean age 37, range 25–65 years) underwent laparoscopic repair of an enterotomy created either advertently or inadvertently during diagnostic or therapeutic laparoscopy. All patients had both preoperative mechanical bowel preparation with 4 L polyethylene glycol-3350 oral solution (Go-LYTELY, Braintree Laboratories Inc., Braintree, MA), and 1 g metronidazole (Flagyl, G.D. Searle, Chicago, IL) at 11:00 p.m., the night before surgery. Intravenous cefoxitin (Mefoxin, Merck, Sharp and Dohme, West Point, PA) was administered 1 h prior to surgery. The indications for surgery were endometriosis (18), pelvic adhesions (7), and adhesions with Crohn's disease (1).

Enterotomies were secondary to CO_2 laser vaporization or excision of endometriosis and/or lysis of adhesions adjacent to or involving the bowel wall (23) and trocar insertion (3). The three enterotomies related to trocar insertion occurred in patients who had prior abdominal surgery. The injuries included small-bowel enterotomies (9), colotomies (4), and rectotomies (13). All repairs were single-layer running closures incorporating mucosa, submucosa, and serosa when available. Suture material was either 3-0 silk or 4-0 polydioxanone suture (PDS, Ethicon, Somerville, NJ) using a curved or straight needle and intracorporeal or extracorporeal tying.

After the repairs were complete, evaluation was performed using one of the following methods. To evaluate small-bowel and colon closures, the abdominal and pelvic cavities were filled with lactated Ringer's (Baxter), and the bowel was observed under the fluid. This area was then inspected for air bubbles, which would indicate that the closure was not airtight. To evaluate the rectosigmoid colon repairs, the posterior cul-de-sac was filled with lactated Ringer's and

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a sigmoidoscopy was performed, again observing for air bubbles. (Sterile milk or indigo carmine was used to further insure that the closures were complete.)

Postoperatively patients received 1 g cefoxitin for three doses every 6 hours. Patients were given clear liquids orally after nausea resolved and were advanced to regular diet as tolerated.

Results

The enterotomies were repaired successfully in all patients with no need for laparotomy. They all tolerated soft to regular diets within 72 h of surgery. Two patients developed postoperative fevers in excess of 38.5° C. Both were moderately obese patients and the fevers were believed to be related to postoperative atelectasis as they resolved promptly with pulmonary toilet.

Twenty-three patients were discharged from the hospital within 24 h of surgery. One patient was discharged on postoperative day 2, and two on postoperative day 3. Each of the latter three patients underwent surgery early in our experience and had been kept for observation of low-grade fever or prolonged postoperative nausea.

No clinical complications related to the laparoscopic bowel repair were noted, and no patients presented after discharge with fevers or obstructive symptoms. No fistulas occurred and all repairs/enterotomies healed without clinical evidence of infection.

Discussion

As laparoscopic techniques become familiar to the general surgeon, the reports of laparoscopic bowel surgery are increasing [1, 3, 8, 14]. To date, there have been case reports emphasizing instrumentation and technique with patient numbers insufficient to draw any conclusion regarding the morbidity or efficacy of the procedure. At present, this is the largest reported series for laparoscopic bowel surgery performed.

As this is a retrospective study, the results may reflect the disadvantages inherent in this type of research. The clinical results for the 26 patients undergoing laparoscopic bowel repair were excellent with no significant morbidity related to the bowel surgery; however, it was a heterogenous population of relatively young, healthy females with benign pathology. Despite this, it is hard to imagine, even among a comparable control group, bowel surgery by an open technique with similar clinical results and minimal hospitalization.

Based on the results of this study, we concluded that small-bowel enterotomies, colotomies, and rectotomies which occurred during laparoscopic procedures in patients who had preoperative bowel preparation may be safely repaired using the laparoscope without the need for laparotomy. Based upon these data, injuries to mechanically prepared bowel (such as those resulting from intraluminal gastrointestinal endoscopy) may be repaired using the laparoscope. This, as well as results of bowel repair in unprepared bowel (as might occur with penetrating trauma) has yet to be determined.

Recently, we have utilized a new technique for small (<0.5 cm) enterotomies in patients who had undergone a preoperative mechanical and antibiotic bowel preparation. If there is only one opening in the bowel (including both the small and large bowel), one Endoloop suture (4-0 PDS, Ethicon) is used for enterorrhaphy. The single loop is tightly applied around the perforation, and the closure verified using the methods described above. This technique is less complicated and therefore faster than a running suture. To date, we have repaired 12 enterotomies (five small bowel and seven large bowel) that occurred with CO_2 laser or cold scissors.

References

1. Cooperman AM, Katz V, Zimmon D, Botero G (1991) Laparoscopic colon resection: a case report. J Laparoendosc Surg 1: 221–224
2. Cooperman AM, Zucker KA (1991) Surgical laparoscopy. Quality Medical Publications St. Louis.
3. Lange V, Meyer G, Scharday HM (1991) Laparoscopic creation of a loop colostomy. J Laparoendosc Surg 1: 307–312
4. Nezhat C, Nezhat F, Metzger DA, Luciano AA (1990) Adhesion reformation after reproductive surgery by videolaseroscopy. Fertil Steril 53: 6: 1008–1011
5. Nezhat C, Nezhat F (1991) Incidental appendectomy during videolaseroscopy. Am J Obstet Gynecol 165: 559–564
6. Nezhat F, Nezhat C, Silfen SL (1991) Videolaseroscopy for oophorectomy. Am J Obstet Gynecol 165: 1323–1330
7. Nezhat C, Burrell MO, Nezhat FR, Benigno BB, Welander CE (1992) Laparoscopic radical hysterectomy with para-aortic and pelvic node dissection. Am J Obstet Gynecol 166: 864–865
8. Nezhat F, Nezhat C, Pennington E (1992) Laparoscopic proctectomy for infiltrating endometriosis of the rectum. Fertil Steril 57: 1129–1132
9. Nezhat C, Green B, Welander C, Nezhat F (1992) Laparoscopic treatment of obstructed ureter due to endometriosis by resection and ureteroureterostomy. A case report. J Urol 1992; 148: 865–868
10. Nezhat C, Nezhat F, Gordon S, Wilkins E (1992) Laparoscopic versus abdominal hysterectomy. J Reprod Med 37: 247–250
11. Nezhat C, Nezhat F (1992) Operative laparoscopy for the management of ovarian remnant syndrome. Fertil Steril 57: 1003–1007
12. Operative laparoscopy study group (1991) Postoperative adhesion development after operative laparoscopy: evaluation at early second-look procedures. Fertil Steril 55: 700–704
13. Peters JH, Ellison C, et al (1991) Safety and efficacy of laparoscopic cholecystectomy. Ann Surg 213: 93–102
14. Saclarides TJ, Ko ST, Airan M, Dillon C, Franklin J (1991) Laparoscopic removal of a large colonic lipoma. Report of a case. Dis Colon Rectum 34: 1027–1029