

Original Article

Fast-Track Surgery in Intestinal Deep Infiltrating Endometriosis

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ABSTRACT **Study Objective:** To evaluate the length of hospital stay (LOS) and the readmission rate in patients undergoing laparoscopic surgery to treat intestinal deep infiltrating endometriosis (DIE) with application of the concepts of fast-track surgery.

Design: Retrospective study of women undergoing laparoscopic treatment of intestinal DIE (Canadian Task Force classification II-3).

Setting: Tertiary referral private hospital.

Interventions: We evaluated 161 women who underwent laparoscopic surgery between January 2010 and April 2013 for complete treatment of intestinal DIE, via either conservative surgery (rectal shaving, mucosal skinning, or anterior disk resection) or radical surgery (segmental bowel resection). After surgery, all specimens were sent for pathologic examination to confirm the presence of endometriosis.

Measurements and Main Results: Patients were divided into 2 groups according to type of surgery (conservative [$n = 102$] or radical [$n = 59$]), and LOS and readmission rate were measured in both groups. Median LOS was shorter in the conservative group compared with the segmental bowel resection group (19 vs 28 hours; $p < .001$). Ninety-two patients (90.2%) in the conservative surgery group were discharged to home on the first postoperative day, compared with only 38 patients (64.4%) in the segmental bowel resection group. Overall, the readmission rate was low (3.1%): 6.8% in the segmental bowel resection group and 1% in the conservative group ($p = .04$; odds ratio, 7.34; 95% confidence interval, 0.8–67.3); however, the need for repeat operation was similar in both groups (3.4% vs 1%; $p = .28$; odds ratio, 3.54; 95% confidence interval, 0.31–39.95).

Conclusion: Implementation of fast-track concepts in the laparoscopic treatment of intestinal DIE resulted in a short LOS and low readmission rate in both the segmental bowel resection and conservative surgery groups. *Journal of Minimally Invasive Gynecology* (2014) 21, 285–290 © 2014 AAGL. All rights reserved.

Keywords: Endometriosis; ERP; Fast track; Laparoscopy; Multimodal

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Integrated management of patients undergoing colon surgery has been described in the medical literature since the end of the 1990s [1] and has been referred to as fast-track surgery, Enhanced Recovery Pathway (ERP), or multimodal surgical care [2]. The concept of fast-track surgery was implemented into clinical practice on the basis of recent developments in perioperative pathophysiology and care, enabling elimination of some procedures that are not justifi-

fied in the perspective of evidence-based medicine [3]. The primary objective of this approach is to hasten recovery, decrease morbidity, and shorten hospitalization after several major surgical procedures [2,4–8]. Key elements involve preoperative patient information (oral and written), short-acting general anesthetic agents, nonroutine use of nasogastric tubes and abdominal drains, opioid-sparing analgesia, and early feeding and mobilization [9,10].

Surgery for treatment of deep infiltrating endometriosis (DIE) affecting the bowel has traditionally been regarded as a complex procedure associated with risk of postoperative complications including anastomotic leakage, rectovaginal fistula, bleeding, and abdominal abscess [11–13]. Conservative surgery (shaving and nodulectomy) may be performed by means of rectal shaving, mucosal skinning,

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and full-thickness anterior rectal wall excision/disc resection and is indicated for treatment of small rectal DIE nodules. Radical surgery (segmental bowel resection) is indicated for treatment of large DIE nodules and/or multiple intestinal lesions [14,15].

A meta-analysis conducted by Adamina et al [8] of an ERP for colon surgery that included trials with a total of 452 patients revealed a 2½-day decrease in duration of hospitalization and a significant reduction in 30-day morbidity. A recent systematic review evaluated the economic effect of ERP in colorectal surgery and showed a tendency toward improved cost-effectiveness of the program [16]. In addition, some authors have demonstrated that early discharge after colon surgery does not result in a higher readmission rate [8,17]. In the field of gynecologic surgery, Nezhat and colleagues demonstrated in the early 1990s that after both laparoscopic radical hysterectomy and laparoscopic bowel resection of DIE patients may be safely discharged within 24 to 48 hours [18–22].

In the present study, we evaluated the results of application of the concepts of ERP in laparoscopic conservative and radical surgical approaches to treatment of intestinal DIE in our service, in particular insofar as the possibility of early discharge and the readmission rate.

Material and Methods

This retrospective study was conducted at Vita Batel Hospital and Sugisawa Medical Center (Curitiba, Paraná, Brazil) between January 2010 and April 2013. All women were operated on by the same gynecologist (W.K.). The study was approved by the Hospital Ethics Committee.

Inclusion criteria for the study were that all women underwent complete surgical treatment of intestinal DIE lesions and that the disease was confirmed at pathologic analysis.

Preoperative workup included transvaginal ultrasound and/or pelvic magnetic resonance imaging [23] and measurement of serum Ca-125 concentration. All procedures were performed via the laparoscopic approach.

The components of ERP of care in our service included the following [2,4]:

- Patients received oral and written preadmission information describing what would happen during hospitalization, what they should expect, and what their role was in the recovery process.
- The duration of preoperative fasting was 8 hours for solids and 4 hours for liquids.
- Standard anesthetic protocol included analgesic and nonsteroidal anti-inflammatory drugs, and opioid only when necessary.
- Intraoperative normothermia was maintained using an upper body forced-air heating cover.
- Intraoperative and postoperative fluid restriction was used, with avoidance of hypovolemia.
- Prophylaxis against thromboembolism included subcutaneous administration of low-molecular-weight heparin and use of an intermittent pneumatic compression device.
- Drainage of the peritoneal cavity was not performed.
- A nasogastric tube was not routinely used in the postoperative period. Rather, an orogastric tube was routinely placed at the beginning of the procedure to decompress the stomach of air previously insufflated from mask ventilation during induction of anesthesia, reducing the risk of gastric injury from insertion of the Veress needle [24]; it was always removed in the end of the procedure.
- Postoperative nausea and vomiting were prevented.
- A Foley catheter was not used in the postoperative period.
- Patients were encouraged to begin an oral diet at 6 hours after surgery.
- Early mobilization was encouraged.

Our standard laparoscopic surgical technique for the treatment of DIE has been published previously [11,14,15]. In general, women with one isolated rectosigmoid DIE lesion <30 mm in diameter and affecting less than one-third of the intestinal circumference underwent conservative surgery (either rectal shaving or anterior disk resection). Women with multiple intestinal DIE lesions >30 mm in diameter and affecting more than one-third of the intestinal circumference underwent segmental bowel resection.

Patients with pathologically confirmed intestinal DIE were divided into 2 groups according to the type of intestinal surgery: conservative surgery (group 1) or segmental bowel resection (group 2). Demographic and baseline data were collected for both groups and included age, body mass index, and preoperative serum Ca-125 concentration. The primary outcomes were length of hospital stay (LOS), postoperative hours (POH), readmission rate, and return to surgery rate. LOS was defined as the time from admission to discharge in days. POH was defined as the number of hours from the end of surgery to discharge from the hospital. Early discharge was defined as LOS <5 days (120 hours) [8]. Readmission was defined as readmission to the hospital within 30 days of discharge. Secondary outcomes were differences in operating time (calculated from skin incision to the last cutaneous suture), estimated blood loss, American Fertility Society reviewed score [25], number of deep infiltrating lesions [26], and complications.

Parameters were measured for both groups. Qualitative variables were compared using the Fisher exact test. The Kolmogorov–Smirnov test was used to test the presence of normal distribution in quantitative variables. Normally distributed variables were tested using the Student *t* test. Non-normally distributed variables were analyzed using the Mann-Whitney *U* test. A *p* value <.05 was considered statistically significant. Normally distributed variables were expressed as mean (SD). Non-normally distributed variables were expressed as median (range).

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