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Original Article

Management and Outcome of Rectal Injury During Gynecologic Laparoscopic Surgery

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ABSTRACT **Objective:** To assess the incidence and management of accidental rectal injury during gynecologic laparoscopic surgery.
Design: A retrospective study with review of outcomes (Canadian Task Force classification II-3).
Setting: A tertiary care/research/university hospital.
Patients: Patients with colon injury during laparoscopy for gynecologic diseases at Samsung Medical Center, Seoul, Korea, from January 2000 to April 2012.
Intervention: Use of absorbable suture or staples in primary repair of injured colon.
Measurements and Main Results: From January 2000 to April 2012, 12 354 patients underwent laparoscopic surgery. Rectal injury occurred in 15 women (0.12%). Their median age was 42.5 years (30–49), and the median length of injury was 3 cm (0.7–7). Among 13 patients with rectal injuries recognized during surgery, 10 patient injuries were repaired primarily with interrupted absorbable sutures without converting laparotomy, 1 patient underwent laparoscopic low anterior resection with Endo-GIA, 1 underwent open primary repair, and 1 underwent open low anterior resection. Two rectal injuries were detected after surgery. One of these patients underwent primary repair under laparotomy at day 4 after surgery. The other patient had development of a rectovaginal fistula requiring open segmental resection 30 days after primary laparoscopy despite conservative management, including percutaneous drainage and prophylactic antibiotics.
Conclusion: Rectal injury during laparoscopy in the gynecologic field can be repaired successfully without the need for a colostomy regardless of mechanism of injury and the size of injury if adequate rectal tissue is available and recognized during surgery. Journal of Minimally Invasive Gynecology (2013) 20, 166–171 © 2013 AAGL. All rights reserved.

Keywords: Complication; Laparoscopy; Primary repair; Rectal injury

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Laparoscopic surgery has become the standard treatment method for various intraabdominal and pelvic procedures in gynecology [1]. The popularity of laparoscopic surgery can be ascribed to its superior cosmesis and early return to normal activity. Moreover, laparoscopic surgery is currently accepted as a safe and efficient method to treat early-stage gynecologic cancer [2–4].

Despite its advantages, laparoscopy remains associated with morbidity, including accidental injury to the bladder, ureter, bowel, and major vessels, and conversion to laparotomy. According to the American Association of Gynecologic Laparoscopists' (AAGL) membership survey of laparoscopy-assisted vaginal hysterectomy, the overall rate of complications was 6%, and the rate of bowel injury was 1% on the basis of 14 911 procedures [2]. The frequency of complications during gynecologic laparoscopic surgery ranged from 0.4% to 3% in other reports [1,5–7].

Accidental rectal injury during surgery is an uncommon but potentially serious complication of gynecologic laparoscopic surgery. Intraoperative management strategies of accidental rectal injury include colostomy or primary repair, low anterior resection, or segmental resection under

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laparotomy or laparoscopy. There have been many reports on operative complications in laparoscopy [1,7–11], but accidental rectal injury has not been the focus of a detailed study. In this study, we used data gathered from our institutional experience with rectal injury during laparoscopy to review the management and outcome of rectal injury in 15 cases of laparoscopy at our institution.

Materials and Methods

Of the 12 354 cases of laparoscopic surgery for gynecologic disease including benign and cancerous lesions from January 2000 to April 2012, 15 were complicated by intraoperative rectal injury. Eight surgeons were involved for laparoscopic surgery. The Institutional Review Board of the Samsung Medical Center approved this study protocol. All procedures were performed at the Samsung Medical Center, Seoul, Korea, and data were reviewed retrospectively. Electronic patient records containing operative notes and postoperative management details were reviewed, and the data collected included the timing of presentation/recognition, length of injured site, type of surgery, postoperative antibiotics, length of hospital stay, drainage, and perioperative outcome. Operative time was defined as the time from the umbilical skin incision to completion of skin closure. The estimated blood loss was calculated by the anesthesiology unit as the difference between the total amount of suction and irrigation plus the difference in the total weight of gauzes before and after surgery. Statistical analysis was performed with SPSS (version 12.0; SPSS, Inc., Chicago, IL).

The patients underwent preoperative bowel preparation consisting of a clear-liquid diet the day before surgery and a Fleets enema the night or morning before surgery. An intravenous first-generation cephalosporin was administered 5 minutes before surgery.

The procedure was performed while the patients were under general anesthesia with endotracheal intubation. Patients were prepared in a modified dorsal lithotomy position convenient for both laparoscopic and vaginal surgical approaches in a 30-degree Trendelenburg position. A 5- or 10-mm, 0- or 30-degree, rigid laparoscope was introduced after induction of pneumoperitoneum with a Veress needle and primary 5- or 10-mm trocar placement at the umbilicus. Additional trocars were then placed in each lower quadrant lateral to the inferior epigastric artery or in the suprapubic area, typically under direct visualization. Trocar sites were variable according to situational clinical decisions. When adhesions were present, adhesiolysis was always carried out to restore normal anatomy and to allow safe secondary trocar entry before commencing the planned surgical procedure. Adhesiolysis was often facilitated by the use of extra trocar sites in areas of the abdominal wall not involved with adhesions. When rectal injuries were recognized during surgery, the operative field was irrigated with saline solution and the rectum with Betadine. When the laceration was primarily repaired, a 2-layer repair is preferable, with single interrupted absorbable sutures. A rubber drain was placed at the posterior cul-de-sac after repair. To avoid the problem of incisional hernias at port sites, intraumbilical incisions were carefully inspected after removal of the primary trocar and closed with 1 or 2 sutures interrupted with 1-0 polyglactin suture material. The integrity of this rectus sheath closure was then checked with index finger palpation. Intraabdominal pressure was maintained between 10 to 12 mm Hg throughout the procedure.

Postoperative Management

In benign diseases, intravenous antibiotics were given, and drainage was maintained for 2 days according to the postoperative management protocol of our institution. For pain control, intravenous patient-controlled analgesia was used for all patients, starting 30 minutes before the end of surgery to 48 hours after surgery, and parenteral analgesia was administered on demand. Oral nonsteroidal antiinflammatory drugs were regularly provided 3 times daily when a soft diet was permitted, generally beginning on postoperative day 1. Patients were discharged on postoperative day 2. In cases of malignant disease, antibiotics and patient-controlled analgesia were administered intravenously, generally for 2 days. The drain was maintained for a period determined by the surgeon's preference. A soft diet was permitted on postoperative day 3, and patients were routinely discharged on postoperative day 7. In the case of rectal injury, broad-spectrum antibiotics (a combination of cephalosporin and aminoglycoside) were given for at least 4 days, and patients started a soft diet after passing gas. The drain was removed at 1 or 2 days after the regular diet was started to ensure there was no leakage of the repair site. Patients were permitted to be discharged after defecation. Outpatient follow-up checks were performed 1 week, 1 month, and 6 months after discharge.

Results

Rectal injury occurred in 15 (0.12%) of 12 354 overall cases of laparoscopic surgeries reviewed in our study. The median age of the affected patients was 42.5 years (30–49), and the median length of injury was 3 cm (0.7–7). The median hospital stay was 9 days (range 8–19), and antibiotics were given for 6.5 days (range 6–14). Drainage was maintained for an average of 7.2 days. The median follow-up period was 6 months (range 1–89). Incidence of surgical complications for each surgeon was similar. Approximately 60% of patients had adhesions. Among 13 patients with rectal injury recognized during surgery, 10 patients were treated primarily with absorbable sutures by interrupted suture in 1 or 2 layers without converting laparotomy by a gynecologist or general surgeon, 1 underwent laparoscopic low anterior resection, and opening conversion was carried out in 2 patients. Endo-GIA was used for anastomosis for laparoscopic low anterior resection. Of these 2, 1 underwent open primary