JOURNAL OF LAPAROENDOSCOPIC & ADVANCED SURGICAL TECHNIQUES
Volume 16, Number 3, 2006

Case Report

Synchronous Laparoscopic Sigmoid Resection and Hysterectomy with Transvaginal Specimen Removal

STEFAN BREITENSTEIN, MD,[1,*] KONSTANTIN J. DEDES, MD,[1,*] MATTHIAS BRAMKAMP, MD,[1] THOMAS HESS, MD,[2] MARCO DECURTINS, MD,[3] and PIERRE-ALAIN CLAVIEN, MD, PhD, FACS[1]

ABSTRACT

Introduction: **Laparoscopic sigmoid resection for recurrent or complicated diverticulitis and laparoscopically assisted hysterectomy for leiomyomas of the uterus are common procedures. A synchronous combination of these two interventions with the advantage of using the vaginal stump as a route for removal of the specimen has not previously been described.**

Materials and Methods: **We used a transvaginal extraction of the uterus and the colorectal segment, followed by a totally intra-abdominal circular stapler anastomosis. The procedure is performed via four trocar incisions, obviating the need for a laparotomy.**

Results: **Two women suffering from diverticulitis and symptomatic uterus myomatomas were treated by combined laparoscopic sigmoid resection and laparoscopically assisted transvaginal hysterectomy. Both patients had an uneventful intraoperative course.**

Discussion: **This new approach, combining two operations, is feasible and leads to almost perfect cosmetic results, cumulatively shorter hospitalization, and good patient satisfaction. Cooperation with a gynecologist as well as experience in advanced laparoscopic surgery is essential.**

INTRODUCTION

DIVERTICULAR DISEASE is one of the most common benign disorders of the colon in the industrialized world. Elective surgery is indicated after recurrent episodes of diverticulitis, and the laparoscopically assisted procedure has become the preferred option in many institutions.[1,2]

Leiomyomas of the uterus are the most common tumor in women of reproductive age, and the most common indication for hysterectomy.[3] Hysterectomy for benign diseases can be performed via abdominal or vaginal access and laparoscopically assisted methods have emerged as the preferred approach. In laparoscopically assisted hysterectomy, mobilization of the adnexae and the uterus is assisted endoscopically while the resection of the uterus is performed transvaginally.

The combination of laparoscopic sigmoidectomy with laparoscopically assisted hysterectomy has not previously been reported. However, transvaginal extraction has been described for different kinds of specimens.[4] These reports show successful procedures with a very low complication rate.

[1]Department of Visceral and Transplantation Surgery, University Hospital of Zurich, Zurich, Switzerland.
Departments of [2]Gynecology and [3]Surgery, Kantonsspital Winterthur, Winterthur, Switzerland.
*These authors contributed equally to this work.

We present a new technique of synchronous endoscopic operations using the vaginal stump as a route for all specimen removal instead of a Pfannenstiel incision.

CASE REPORTS

Case 1

A 50-year-old woman in good general condition presented with pain in the lower abdomen. Investigations including computed tomography revealed an intra-abdominal abscess due to covered, perforated sigmoid diverticulitis. Furthermore, an enlarged uterus with multiple leiomyomas was described. The diverticulitis was successfully treated conservatively with antibiotics. Colonoscopy 2 months later confirmed the diverticular disease without neoplastic colon disease. The indication for elective sigmoidectomy was given. A hysterectomy was also recommended by the gynecologist due to recurrent bleeding disorders related to a large uterine fibroids. The patient was fully informed and consented to a synchronous hysterectomy. The patient had no prior abdominal surgery, no deliveries, and no medications in her medical history.

The intraoperative course was uneventful. Perioperative antibiotic prophylaxis with cephalosporin and metronidazol was continued until postoperative day 2.

Morphine was given by subcutaneous injection until postoperative day 1, then nonmorphine analgesics were orally used. Food intake was gradually increased. On postoperative day 7 the patient developed colitis positive for *Clostridium difficile*, and became asymptomatic under oral vancomycin. She was discharged on postoperative day 15. At 4-week postoperative follow-up she showed no abdominal or gynecological problems.

Case 2

A 39-year-old woman presented with a history of 3 episodes of uncomplicated diverticulitis. Colonoscopy confirmed a diverticular disease of the sigmoid colon. She reported coexistent dysmenorrhea and hypermenorhea with uterine fibroids. The patient, having given birth once, requested the removal of the uterus, refusing conservative treatment options. The patient requested a synchronous treatment with a single anesthesia, since her medical history included an open appendectomy and a gynecologic diagnostic laparoscopy.

This patient's intra- and postoperative courses were uneventful except for a urinary tract infection treated with antibiotics. Morphine was delivered by patient-assisted control until postoperative day 1, then nonmorphine analgesics were orally used and food intake was also gradually increased. She was discharged on postoperative day 9. Follow-up at 4 weeks showed abdominal and gynecological recovery.

Surgical technique

The operation is performed by a teamwork of a colorectal surgeon and a gynecologist, assisted by two residents. The patient lies in a modified lithotomy position. An open pneumoperitoneum is carried out using a small median supraumbilical incision. After insertion of the camera, the working trocars are placed under visual control: a 10-mm trocar above the symphysis, a 10-mm trocar in the left lower quadrant (both RIWO-ART metallic trocar; Richard Wolf, Treier, Switzerland) and a 12-mm trocar in the right lower quadrant (Endopath®; Ethicon, Switzerland) (Fig. 1). The operation begins with the mobilization of the left-side colon from the sigmoid colon to the left colon flexure. After dissection of the sigmoid vessels, the mobilization of the proximal rectum is performed by dissection of the rectal mesentery up to the distal resection line. This is followed by cutting through the proximal rectum with the endoscopic stapler. After dissection of the sigmoid mesentery toward the proximal resection line, the colon is also separated with the endoscopic stapler. The resected rectosigmoidal colon is deposited pericecally, while either the laparoscopically assisted (case 1) or the totally vaginal (case 2) hysterectomy is performed. After the transvaginal removal of the uterus, a metallic grasper is introduced through the vaginal stump to easily withdraw the colonic specimen. (Fig. 2A). The stapler head (Premium Plus, CEEA; Tyco, Switzerland) is then maneuvered in the abdominal cavity prior to closure of the vagina by the gynecologist (Fig. 2B).

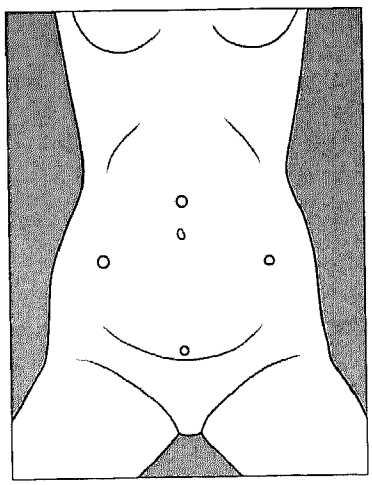

FIG. 1. Four trocars are placed: a 12-mm supraumbilically, a 10-mm above the symphysis, a 10-mm in the left lower quadrant, and a 12-mm in the right lower quadrant.

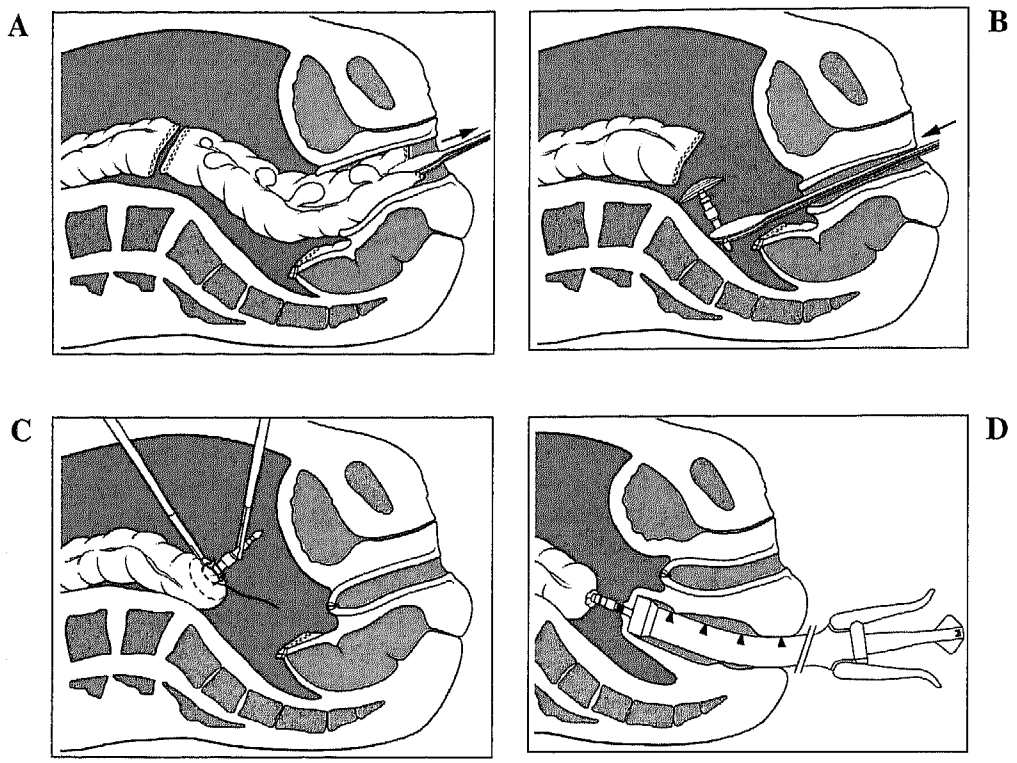

FIG. 2. **A:** Transvaginally inserted grasper for removal of the resected sigmoid colon after vaginal hysterectomy. **B:** Transvaginal insertion of the stapler head in the abdominal cavity. **C:** Purse-string suture around the stapler head performed laparoscopically. **D:** Colorectal anastomosis using a circular transanal stapler.

Pneumoperitoneum can now be re-established. After cutting the stapled resection line, the stapler head is placed in the colon. A purse-string suture, stitched intra-abdominally (Fig. 2C), is used to close the colon, followed by a laparoscopically controlled colorectal anastomosis using a circular 31-mm transanal stapler (Premium plus CEEA, Tyco, Switzerland) (Fig. 2D). The anastomosis is checked for leakage and vascularization as well as tension. After hemostasis and flushing of the pelvis, the instruments are removed. Finally the 4 small skin incisions are closed by suture stitches. The length of each wound is between 8–15 mm.

DISCUSSION

Despite the absence of randomized controlled trials comparing open *versus* laparoscopic sigmoid resection for diverticular disease, the laparoscopic approach has gained wide popularity and acceptance by patients and physicians. Advantages including shorter hospitalization and improved cosmetic results have been reported by numerous matched-control and prospective cohort studies.[5] Although the major part of the laparoscopic procedure can be performed via 5–12 mm trocars, a Pfannenstiel or gridiron incision is required for extraction of the specimen and insertion of the stapler head into the colon. These minilaparotomies are associated with a higher risk for wound complications such as infections, hematomas, and incisional hernias and are cosmetically inferior to the trocar incisions.[6,7]

In cases with contraindications for vaginal hysterectomy, laparoscopic or abdominal hysterectomy should be performed. Although data on laparoscopic transvaginal hysterectomy *versus* abdominal hysterectomy are controversial regarding complications, it is generally accepted that laparoscopic transvaginal hysterectomy leads to less postoperative pain, quicker recovery, and better quality of life in the short term.[8,9]

The possibility of using the vaginal route as an alternative for specimen extraction in laparoscopy has been proposed by a few surgeons.[4] Extraction of spleen, kidney, and other abdominal masses through a colpotomy in female patients has been described with very low morbidity (0.2%).[4] Zornig described in 1994 two cases of laparoscopic sigmoid resection and specimen removal through a colpotomy, and suggested routine use of this route in his female patients.[10] In 1996, Redwine

reported 5 cases of laparoscopically assisted transvaginal segmental resection of the colorectum. He performed open and hand-sutured anastomoses by delivering the colon loop transvaginally through acolpotomy.[11] Recently, Ghezzi reported extraction of pelvic masses (mostly benign ovarian tumors) by colpotomy in 63 patients.[4] No intra- or postoperative complications related to colpotomy were reported, and patient satisfaction was high.

We report for the first time a combined laparoscopic sigmoid resection and laparoscopic hysterectomy with transvaginal removal of all specimens. In this method, the anastomosis is performed completely intra-abdominally, the stapler head being placed in the abdominal cavity via the vaginal stump. The most difficult stage in this procedure is the insertion of the stapler head in the colon and the closure of the surrounding colon with a purse-string suture. The intra-abdominal knot tying together with the dissection of the mesenteric fat at the colon around the stapler head required approximately 30 minutes.

Nonsurgical infections (antibiotic-related colitis and urinary tract infection) in the postoperative phase combined with difficult personal domestic situations, led to a relatively long hospitalization in both cases. However, intra- and postoperative followups were otherwise uneventful.

Despite their obvious advantages, transvaginal extraction techniques have not yet been widely accepted. Prospective randomized studies have not been carried out. One factor could be that visceral surgeons do not normally deal with vaginal surgery. Furthermore, there seems to be a reluctance to involve organs other than those directly affected by disease. There may also be concern about an increased risk of fistula development between adjacent wounds in two cavity organs. However, in the reported cases of Zornig and Redwine, no fistula formation occurred.[10,11]

We conclude that synchronous hysterectomy and laparoscopic sigmoid resection with transvaginal removal of both specimens is feasible. Advanced experience in laparoscopic colorectal surgery together with close cooperation with a gynecologist is essential. This combined technique leads to almost perfect cosmetic results and a high degree of patient satisfaction.

REFERENCES

1. Wolff BG, Devine RM. Surgical management of diverticulitis. Am Surg 2000;66:153–156.
2. Schwandner O, Farke S, Fischer F, Eckmann C, Schiedeck TH, Bruch HP. Laparoscopic colectomy for recurrent and complicated diverticulitis: a prospective study of 396 patients. Langenbecks Arch Surg 2004;389:97–103.
3. Wallach EE, Vlahos NF. Uterine myomas: an overview of development, clinical features, and management. Obstet Gynecol 2004;104:393–406.
4. Ghezzi F, Raio L, Mueller MD, Gyr T, Buttarelli M, Franchi M. Vaginal extraction of pelvic masses following operative laparoscopy. Surg Endosc 2002;16:1691–1696.
5. Guller U, Jain N, Hervey S, Purves H, Pietrobon R. Laparoscopic vs open colectomy: outcomes comparison based on large nationwide databases. Arch Surg 2003;138:1179–1186.
6. Winslow ER, Fleshman JW, Birnbaum EH, Brunt LM. Wound complications of laparoscopic vs open colectomy. Surg Endosc 2002;16:1420–1425.
7. Montz FJ, Holschneider CH, Munro MG. Incisional hernia following laparoscopy: a survey of the American Association of Gynecologic Laparoscopists. Obstet Gynecol 1994;84:881–884.
8. Garry R, Fountain J, Mason S, et al. The eVALuate study: two parallel randomised trials, one comparing laparoscopic with abdominal hysterectomy, the other comparing laparoscopic with vaginal hysterectomy. BMJ 2004;328:129.
9. Marana R, Busacca M, Zupi E, Garcea N, Paparella P, Catalano GF. Laparoscopically assisted vaginal hysterectomy versus total abdominal hysterectomy: a prospective, randomized, multicenter study. Am J Obstet Gynecol 1999; 180:270–275.
10. Zornig C, Emmermann A, von Waldenfels HA, Felixmuller C. [Colpotomy for specimen removal in laparoscopic surgery]. Chirurg 1994;65:883–885. [in German]
11. Redwine DB, Koning M, Sharpe DR. Laparoscopically assisted transvaginal segmental resection of the rectosigmoid colon for endometriosis. Fertil Steril 1996;65:193–197.

Address reprint requests to:
Stefan Breitenstein, MD
Department of Visceral and Transplantation Surgery
University Hospital of Zurich
Rämistrasse 100
CH-8091 Zurich
Switzerland

E-mail: stefan.breitenstein@usz.ch