

Advanced Gynecologic Laparoscopy in a Fast-Track Ambulatory Surgery Center

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ABSTRACT

Background/Objectives: It has been shown that major gynecologic laparoscopy is safe in hospital ambulatory settings, but there is little data to suggest the same in freestanding ambulatory surgery centers. This study evaluates the safety and efficacy of advanced gynecologic laparoscopic surgery using a fast-track model in freestanding ambulatory surgery centers and discusses our institution protocols.

Methods: Retrospective, multicenter review was conducted of major gynecologic surgeries from August 1st 2010 to September 30th 2011 in 3 surgical centers with one primary surgeon. All patients were treated for symptomatic uterine leiomyomas and/or endometriosis. Primary outcome measures were unplanned admissions and discharge within 23 hours.

Results: One hundred and thirty-four patients underwent major laparoscopic gynecologic surgery with a total of 160 procedures: 77 stage IV endometriosis treatment including 7 disk excisions of endometriosis from the large bowel, 3 ureteroneocystostomies and 1 partial bladder resection, 38 myomectomies, and 34 hysterectomies including 12 modified radical hysterectomies. The overall unplanned admission rate was 4.5%. One hundred and thirty-one patients (97.7%) were discharged within 24 hours after surgery. Three patients (2.2%) were transferred to the hospital postoperatively: 1 patient for observation of postoperative anemia and 2 patients for postoperative fever. Three patients (2.2%) were admitted to the hospital after discharge: 1 patient for postoperative ileus, 1 patient for postoperative fever, and 1 patient with septic pelvic thrombophlebitis. These postoperative issues all resolved without complication, and all patients had an uneventful follow-up.

Conclusions: With appropriate resources and an experienced surgeon, advanced laparoscopic surgery can be safely performed in a fast-track ambulatory surgery center with a high rate of discharge within 23 hours and low unplanned readmission rate.

Key Words: Ambulatory surgery center, Endometriosis, Fast-track surgery, Hysterectomy, Laparoscopy, Myomectomy.

INTRODUCTION

The role of laparoscopy for major abdominal surgery has been well established, especially in the field of gynecology.^{1,2} Multiple studies have shown that laparoscopic surgery results in lower morbidity, better visualization, decreased blood loss, decreased postoperative pain, and faster recovery.³⁻⁵ As endoscopic surgeons continue to advocate for minimally invasive surgery, a logical next step is to improve efficiency by using ambulatory care settings. There has been tremendous growth in the use of ambulatory surgery centers in the United States, which is likely due to the increased efficiency and decreased cost.⁶⁻⁹ Specialized surgical teams are routinely employed in ambulatory surgery centers, improving teamwork, communication, and readiness for the unanticipated needs of the surgeon. These factors increase productivity, which likely contributes to the decreased cost. However, there are limitations to free-standing surgery centers, such as decreased reimbursement, which can be slightly offset by instruments choice, limited external resources in certain geographies, and decreased availability for immediate intraoperative consultation.¹⁰

Although it has been shown that major gynecologic laparoscopic surgery is safe in a hospital ambulatory surgery site, there is limited data to suggest that this same safety and efficiency is also true in freestanding ambulatory surgery centers.¹¹⁻¹⁷ This study attempts to evaluate the safety and efficacy of major gynecologic laparoscopic surgery in the ambulatory care setting and discusses the fast-track protocols at our ambulatory surgery center.

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MATERIALS AND METHODS

This study is a retrospective, multicenter cohort analysis of consecutive major abdominal surgeries performed at free-standing surgery centers by a primary surgeon. Institutional review board approval was obtained. Data was collected from chart review of 134 consecutive patients who had major laparoscopic surgery at 3 ambulatory surgery centers from August 1st 2010 to September 30th 2011. Major gynecologic surgery was defined as fertility sparing-treatment of stage IV endometriosis, myomectomy, or hysterectomy. No patients were excluded. Data was collected from 3 freestanding ambulatory surgery centers, and the same primary surgeon performed all surgeries. In California, ambulatory surgery centers are not permitted to keep postoperative patients beyond 23 hours and 59 minutes after surgery. Therefore, the main outcome measures were discharge by 23 hours and 59 minutes and unplanned postoperative admissions.

Our surgical protocols are as follows. After patients have been identified as appropriate surgical candidates, they are scheduled for surgery at either an affiliated hospital or an ambulatory surgery center based on their current state of health. Patients who are American Society of Anesthesia category 1 or 2, defined as, healthy or with only mild systemic disease, are eligible for surgery in one of the ambulatory surgery centers. Prior abdominal surgery, chronic pain, size of fibroids, or stage of endometriosis are not exclusion criterion for surgery at an ambulatory surgery center. The ambulatory surgery centers are equipped with 2 to 4 operating rooms and 3 to 12 beds for preoperative preparation and postoperative recovery. The nurses are staffed 2:1 during the day and night and work in 8-hour shifts. The surgery centers remain open 24 hours if a patient remains overnight; otherwise, they will close after the last patient is discharged. The most common indications for continued observation include postoperative pain and/or nausea. The surgery centers have access to bedside hematocrit and blood chemistry labs and a complete laboratory service that picks up samples from 8 AM to 10 PM daily. Each surgery center is located within 5 to 15 minutes of a full-service hospital, in the event of an emergency.

Prior to surgery, each patient undergoes a 1-hour preoperative appointment to prepare the patient on the details of the surgery and postoperative care. This includes the routine minor bowel preparation, which includes high-calorie clear liquid diet and 1 or 2 enemas the night prior to surgery, common postoperative discomforts, and routine postoperative care. They are given prescriptions to fill

prior to surgery for 200 µg vaginal misoprostol for cervical softening, Motrin 600 mg, oxycodone 5 mg, Colace 100 mg, and omeprazole 20 mg and ondansetron 4 mg. They are given a detailed information packet with all of the information clearly described for reference. This visit is ideally completed with both the patient and their postoperative caregiver (eg, partner, parent, friend) so both parties can hear the information and ask questions.

On the day of surgery, patients arrive at the surgical center 1.5 hours prior to their scheduled surgery times. Once in the operating room, they are positioned on a beanbag in dorsal lithotomy position using Allen stirrups with their arms adducted. Care is taken to ensure that there are no pressure points. Regarding surgical technique, a uterine manipulator and Foley catheter are placed in all cases. A closed entry technique with the Veress needle and concurrent carbon dioxide gas insufflation is used, as previously described.¹⁸ Following the establishment of pneumoperitoneum, a 12-mm camera port is placed at the umbilicus. Thereafter, 3 additional 5-mm ports are placed, in the right lower quadrant, the left lower quadrants, and suprapubically. With a large myomatous uterus, placement of accessory trocars may vary in order to optimize triangulation or visualization.

The treatment of endometriosis is carried out per previously described protocols for fertility-sparing treatment of endometriosis.^{2,19} These techniques involve precise and directed excision and ablation of all endometriotic implants and restoration of normal anatomy. Bowel and bladder surgery in the treatment of endometriosis is completed as previously described.^{2,20-22} The laparoscopic procedures for fertility-sparing endometriosis include chromopertubation, hysteroscopy, cystoscopy, and proctoscopy. The approach to myomectomies is based on fibroid location, size, and quantity. A laparoscopic-assisted myomectomy is performed to decrease blood loss, operating time and iatrogenic spread of potential sarcoma if the fibroid is >9 cm and non-pedunculated, there are multiple myomas totaling ≥ 15 cm² or there are >35 cm non-pedunculated myomas.²³⁻²⁵ The laparoscope is used to identify anatomy, treat concurrent endometriosis, and remove the smaller fibroids. A 4-cm suprapubic mini-laparotomy incision is made to morcellate the fibroids, remove the larger fibroids, and close the uterine defects. In cases of pedunculated myomas, even very large myomas are done laparoscopically if an electric morcellator is available. If not available, a 4-cm mini-laparotomy is made to morcellate the fibroid as described.

Total laparoscopic hysterectomies are performed in the usual fashion and are accompanied by cystoscopy in all cases. Twelve of the hysterectomies in this series were completed as modified radical hysterectomies for endometriosis and/or adhesions that included extensive dissection of the paravesical, pararectal, rectovaginal, and vesicovaginal spaces; desiccation of the round ligament as close to the pelvic sidewall as possible; ureterolysis; and desiccation of the uterine vessels at the origin.

RESULTS

One hundred and thirty-four women underwent major laparoscopic gynecologic surgery. There were 160 total surgical procedures: 77 conservative stage IV endometriosis treatment including 7 disk excisions of bowel endometriosis, 3 ureteroneocystostomies, and 1 partial bladder resection; 38 myomectomies; and 34 hysterectomies (Table 1). In the 38 women who underwent myomectomy, the average weight of the leiomyomas was 240 g (range 5 g–3400 g). In the hysterectomy group, the average uterine weight was 283 g (range 46 g–950 g).

The overall unplanned admission rate was 4.5%. One hundred and thirty-one patients (97.7%) were discharged within the 23 hours of surgery. Three patients (2.2%) were transferred to hospital immediately after the operation. One laparoscopic hysterectomy patient and 1 laparoscopic myomectomy patient developed a fever greater than 38.3°C so were transferred to the hospital. They subsequently had a negative infectious workup and were discharged home with uncomplicated follow-up. One laparoscopic myomectomy patient developed acute anemia immediately after the operation and was transferred to the hospital for continued observation and subsequent blood transfusion. She was discharged home without further event and had an uncomplicated follow-up.

Of the 131 patients who were discharged within 23 hours, 3 patients (2.2%) were later admitted to hospital. One hysterectomy patient developed a postoperative ileus, which resolved with conservative management. One hysterectomy patient developed a fever greater than 38.3°C and subsequently had a negative infectious workup. One fertility-sparing treatment of endometriosis patient developed a fever and pain postoperatively, which had a negative infectious workup and was responsive to heparin. She was diagnosed with septic pelvic thrombophlebitis. Each of these patients were discharged home with uneventful follow-up (Table 1).

DISCUSSION

This study suggests that advanced laparoscopic gynecologic surgery can be safely performed using a fast-track model in freestanding ambulatory surgery centers with a low unplanned admission rate, a low complication rate, and high discharge rate within 23 hours. As the foundation for laparoscopic surgery in gynecology continues to grow and becomes the standard of care, the skill of individual surgeons and available instrumentation increases. Many surgeons, however, do not yet feel comfortable performing major gynecologic surgery as an outpatient surgery and certainly not in a surgery center. This study suggests that with a skilled surgeon and a trained operating room and recovery team, ambulatory surgery centers are safe and effective for major gynecologic surgery. There are several factors that contribute to the success of ambulatory surgery center surgeries: careful preoperative planning, meticulous intraoperative technique, and easy access to additional resources if needed.

Proper patient selection of low-risk surgical candidates is an important initial step to ensure safety. This includes correction of baseline anemia with iron supplementation

Table 1.
Surgical Procedures

| Surgery | Patients, <i>n</i> (%) N = 134 | Unplanned Transfer—Immediate Admission After Surgery | Unplanned Admission After Discharge |
|--|-----------------------------------|---|--|
| Treatment of stage IV endometriosis | 77 (57) | 0 | 1 (1.3) |
| With large bowel disk excision | 7 (4.1) | 0 | 0 |
| With ureteroneocystostomy | 3 (2.2) | 0 | 0 |
| With partial bladder resection | 1 (0.7) | 0 | 0 |
| Laparoscopic myomectomy or laparoscopic assisted myomectomy | 38 (28) | 2 (5.3) | 0 |
| Laparoscopic hysterectomy | 34 (25) | 1 (2.9) | 2 (5.9) |

or hormonal treatment, such as gonadotropin-releasing hormone injections, and preoperative assessment of American Society of Anesthesia category. Finally, extensive preoperative counseling prepares patients and their caregivers for common events and discomforts postoperatively. This helps alleviate the anxiety of being discharged home, which decreases postoperative admission rates. Each patient is given their medications prior to surgery so there are no lapses without pain medication or antiemetics. Additionally, patients are given the physician's pager number so that they may speak to a physician 24 hours a day.

The two most common indications for continued observation and admission to the hospital include persistent pain and postoperative nausea, which were not noted to be contributing factors in this study. The surgical techniques of using meticulous dissection, assurance of hemostasis, removal of all intra-abdominal fluid, and removal of the carbon dioxide gas appear to increase patient comfort postoperatively. Patients routinely receive intravenous Toradol postoperatively, which helps to decrease the need of narcotic drugs. This low incidence of postoperative pain is particularly impressive as a large proportion of this patient population is diagnosed with chronic pelvic pain and routinely takes narcotic pain medication. Postoperative nausea is controlled with intravenous ondansetron and metoclopramide while recovering, but each patient is also prescribed oral ondansetron to take at home. This significantly decreases nausea with narcotic pain medication and decreases the anxiety of developing nausea once discharged.²⁶

Finally, it is necessary to have an ambulatory surgery center that has easy access to additional resources in the event they are needed. The surgery centers in this study have the availability for an overnight registered nurse if the patient remains longer than the usual 4 to 6 hours postoperatively. There is the availability to have typed and crossed blood delivered in case of emergencies, and there are several hospitals within the near vicinity. However, as shown in this study, these additional resources are rarely needed. The estimated rate of unplanned admission following ambulatory surgery center was 4.5% in our study, which aligns with the previously published rates 1.1% to 5.4%.²⁷⁻²⁹

As noted, ambulatory surgery centers have multiple benefits including increased efficiency, teamwork, and productivity. There is a growing body of evidence that ambulatory surgery centers are also a safe and acceptable location in which to have major surgery. Taylor¹¹ was part

of the first team in the United States to extol the feasibility of laparoscopic hysterectomy in an outpatient setting. Subsequently, continued support has gathered for the use of ambulatory surgery centers for laparoscopic hysterectomy.¹²⁻¹⁵ Alperin et al¹⁶ recently published their data that supported the use of the outpatient setting for laparoscopic hysterectomy in patients with large uteri, with low subsequent morbidity. Despite these advantages, many procedures, which could be performed in an ambulatory surgery center, are still performed at hospitals with the possibility of decreased efficiency and unnecessary overnight stays. To our knowledge, this is the first study that shows by using proper patient selection and preparation, following strict surgical techniques, and having available resources, more advanced surgical procedures, such as treatment of stage IV endometriosis, bowel surgery, ureteroneocystostomies, and bladder resections, can be performed in fast-track ambulatory surgery centers with high patient safety and efficiency. However, it must be recognized that a very experienced surgeon with a high-volume practice performed these surgeries.³⁰ This is a limitation to the generalizability of this study, as these results might not be applicable to the general gynecologic surgeon. Nonetheless, with the continued growth of minimally invasive surgery and more specialized surgeons, the use of ambulatory surgery centers will likely continue to expand as further studies support the safety of major gynecologic surgery in freestanding ambulatory surgery centers.

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