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Original Article

Laparoendoscopic Single-site Radical Hysterectomy With Pelvic Lymphadenectomy: Initial Multi-institutional Experience for Treatment of Invasive Cervical Cancer

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ABSTRACT **Study Objective:** To describe the feasibility, safety, and outcomes of women with stage I cervical cancer treated with laparoendoscopic single-site surgery radical hysterectomy (LESS-RH).

Design: A retrospective descriptive study (Canadian Task Force classification III).

Setting: Multiple academic teaching hospitals.

Patients: Women with Fédération Internationale de Gynécologie et d'Obstétrique FIGO stage IA1 to IB1 cervical cancer.

Interventions: LESS-RH as the primary therapy for cervical cancer performed by a gynecologic oncologist with expertise in LESS. A multichannel, single-port access device; a flexible-tipped 5-mm laparoscope; and a multifunctional instrument were used in all cases. Clinicopathologic, surgical, and perioperative outcomes were analyzed.

Measurements and Main Results: Twenty-two women were identified in whom a LESS-RH was attempted; 20 (91%) successfully underwent the procedure, including 19 in whom pelvic lymphadenectomy (PLND) was completed. Of the 2 converted procedures, 1 patient underwent 2-port laparoscopy secondary to truncal obesity, and 1 patient underwent conversion to laparotomy secondary to external iliac vein laceration during PLND. The median age and body mass index were 46 years and 23.3 kg/m^2, respectively. The median number of pelvic lymph nodes removed was 22. One patient experienced an intraoperative complication, and no patient required reoperation. The margins of excision were negative. One patient with 2 positive pelvic nodes and 1 patient with microscopic parametrial disease received adjuvant chemosensitized radiation; 3 additional patients received adjuvant radiation therapy secondary to an intermediate risk for recurrence. After a median follow up of 11 months, no recurrences were detected.

Conclusion: LESS-RH/PLND is feasible and safe for select patients with stage I cervical cancer. Larger studies are needed to confirm whether the increased technical difficulty of this procedure justifies its use in routine gynecologic oncology practice. Journal of Minimally Invasive Gynecology (2014) 21, 394–398 © 2014 AAGL. All rights reserved.

Keywords: Cervical cancer; Laparoendoscopic single-site surgery; Radical hysterectomy

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The use of minimally invasive techniques for the treatment of cervical cancer and other gynecologic malignancies is increasingly common. In women with early-stage cervical cancer, equivalent oncologic outcomes and reduced perioperative morbidity are observed in retrospective studies when radical hysterectomy and

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lymphadenectomy procedures are performed via laparoscopic or robotic-assisted approaches compared with an open abdominal approach [1–5].

Laparoendoscopic single-site surgery (LESS) represents 1 of the newest innovations in minimally invasive surgery and has several potential applications in gynecologic oncology [6]. It is considered an evolving surgical approach aimed at further minimizing the invasive nature of surgery. Rather than using multiple abdominal incisions, as in traditional or robotic-assisted laparoscopy, procedures are performed through a single, small incision positioned at the base of the umbilicus. Experience using LESS for both benign and malignant gynecologic conditions is rapidly expanding [7–9]. Studies across surgical disciplines report the feasibility and safety of LESS for the performance of complex pelvic procedures [10–13]. Although conflicting reports exist, several studies suggest improved patient satisfaction and cosmesis scores and lower narcotic requirements with LESS compared with conventional laparoscopic or robotic-assisted methods [14,15].

Our research group previously reported on the first case studies and technique of LESS radical hysterectomy and pelvic lymphadenectomy (LESS-RH/PLND) for the treatment of early-stage cervical cancer [16,17]. The aim of this study was to describe the feasibility, safety, and early outcomes associated with the performance of LESS-RH/PLND in a larger series of women with stage I cervical cancer.

Methods

This was a retrospective, institutional review board–approved study performed at 4 academic institutions (Massachusetts General Hospital, Boston, MA; Greater Baltimore Medical Center, Baltimore, MD; Cleveland Clinic, Cleveland, OH; and Catholic University of the Sacred Heart, Rome, Italy). Gynecologic oncology surgeons with expertise in advanced laparoscopy and laparoendoscopic single surgery performed all procedures with the assistance of fellows-in-training. All women undergoing primary surgical management for the treatment of stage IA1 to IB1 cervical cancer using the LESS approach were identified. Clinical data were abstracted from computerized medical record systems.

Procedures were performed under general anesthesia. Preoperative bowel preparation was administered at the discretion of the surgeon. All patients received perioperative antibiotics and venous thrombosis prophylaxis with sequential compression devices with or without preoperative heparin injection. Patients were placed in the dorsal lithotomy position with arms tucked at their sides. An orogastric tube placed to decompress the stomach was removed postoperatively, whereas Foley catheter drainage was maintained for a period of time left to the discretion of the surgeon.

The LESS-RH/PLND technique has been previously described in detail by our research group [16,17]. A condensed description of the procedure is reported here. The RUMI uterine manipulator and the Koh Colpotomizer (both from Cooper Surgical, Trumball, CT) were used as described by Frumovitz and Ramirez [18]. Alternately, either the V-Care (ConMed Corporation, Utica, NY) or Clermont-Ferrand uterine manipulator (Karl-Storz, Tuttlingen, Germany) was used. A 1.5- to 2.5-cm incision was made near or through the base of the umbilicus, and the peritoneal cavity was accessed using the Hasson technique. A commercially available multichannel port (Olympus QuadPort, TriPort or TriPort+ [Olympus America Inc., Center Valley, PA]; Covidien SILS Port [Covidien, Mansfield, MA]; or the Gelpoint Advanced Access Platform [Applied Medical, Rancho Santa Margarita, CA]) was introduced, and a carbon dioxide pneumoperitoneum was established.

A 5-mm standard definition laparoscope with deflecting tip (EndoEye, Olympus America Inc.) was used in all cases. A variety of endoscopic tools were used for tissue dissection and vessel sealing including ultrasonic shears (SonoSurg, Olympus America Inc. and Harmonic Scalpel; Ethicon Endo-Surgery, Cincinnati, OH) and bipolar coagulation devices (LigaSure, Covidien; Gyrus Lyons Forceps, Olympus America Inc.; and THUNDERBEAT, Olympus America Inc.). Standard laparoscopic instrumentation was used in conjunction with an articulating grasper (Covidien) at the discretion of the surgeon.

The surgical procedure for radical hysterectomy and pelvic lymphadenectomy was performed based on traditional principles (Video 1 and 2). The order in which the procedures were performed and the type of radical hysterectomy performed, from class B1 to C according to Querleu and Morrow's classification, was at the discretion of the surgeon [19]. Lymph nodes were removed with endoscopic bags, whereas the hysterectomy specimen was delivered vaginally. Vaginal cuff closure was performed either transvaginally or using LESS. Closure of the umbilical fascial incision was performed with a 0.0 delayed absorbable suture in a continuous fashion.

Statistical analysis was performed using GraphPad InStat version 3.10 for Windows (GraphPad Software, San Diego, CA).

Results

Between October 2010 and July 2013, 22 women were identified in whom a LESS-RH was attempted; 20 (91%) successfully underwent the procedure. Pelvic lymphadenectomy was performed in conjunction with LESS-RH in 19 women. Of the 2 converted procedures, 1 patient underwent 2-port laparoscopy (with the single port and an additional 5-mm port) secondary to truncal obesity, and 1 patient underwent conversion to laparotomy secondary to an external iliac vein laceration during the pelvic lymphadenectomy. The latter patient received an intraoperative blood transfusion and required anticoagulation for a postoperative deep venous thrombus distal to the injury. A second patient was