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Total Microlaparoscopic Radical Hysterectomy in Early Cervical Cancer

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ABSTRACT

Background and Objective: In less than 2 decades, laparoscopy has contributed to modification in the management of early cervical cancer patients, and all comparisons between open and laparoscopic-based radical operations showed an identical oncological outcome. The aim of this study is to describe surgical instrumentations and technique to perform total microlaparoscopy radical hysterectomy in early cervical cancer patients and report our preliminary results in terms of operative time and perioperative outcomes.

Methods: Between January 1, 2012, and March 25, 2012, 4 consecutive early cervical cancer patients were enrolled in this study.

Results: We performed 3 type B2 and 1 type C1-B2 total microlaparoscopy radical hysterectomy, and in all cases concomitant bilateral salpingo-oophorectomy and pelvic lymphadenectomy were carried out. Median operative time was 165 minutes (range: 155 to 215) (mean: 186), and median estimated blood loss was 30 mL (range: 20 to 50). Median number of pelvic lymph nodes removed was 12 (range: 11 to 15). All procedures were completed without 5-mm port insertion and without conversion. No intraoperative or early postoperative complications were reported.

Conclusions: This report suggests a role of microlaparoscopy in the surgical management of early cervical cancer with adequate oncological results, superimposable operative time, and perioperative outcomes with respect to standard laparoscopy.

Key Words: Microlaparoscopy, Radical hysterectomy, Cervical cancer.

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INTRODUCTION

In less than 2 decades, laparoscopy has definitely contributed to modification in the management of cervical cancer patients. After laparoscopy's introduction in 1990,[1] several studies have documented the safety and feasibility of laparoscopic radical hysterectomy in early-stage cervical cancer patients (ECC).[1–10] In the first period, laparoscopy was considered assistance to a radical vaginal approach (LARVH), whereas more recently there is general agreement about the achievability to perform all of the procedures by laparoscopy (TLRH).[2,3] All comparisons between open and laparoscopic-based radical operations for the treatment of women with ECC show an identical oncological outcome.[2,4,6,8]

In recent years, many efforts have been made by laparoscopic surgeons to further reduce the surgical invasiveness of minimally invasive approaches by reducing the trauma of access ports by reducing their diameter to 3 mm or performing single-port surgery. The evolution of even more minimally invasive surgery toward microlaparoscopy (M-LPS) and single-port laparoscopy (LESS) has been supported by different goals: (1) To extend to even more minimally invasive techniques the benefits already realized for laparoscopy versus laparotomy in terms of postoperative pain, recovery time, and cosmetic results; and (2) to perform laparoscopic procedures with the least-invasive approach with the assumption of minimizing the risk of incisional complications.

Recently, different studies showed an early postoperative benefit in terms of pain for patients who underwent hysterectomy by LESS with respect to patients treated using standard laparoscopy (S-LPS).[11,12] Regarding M-LPS hysterectomy, Ghezzi et al[13,14] recently found that ports can be safely reduced in size without a negative impact on the surgeon's ability to perform total hysterectomy and that M-LPS appears to have no advantage over S-LPS in terms of postoperative pain. We have recently shown that both M-LPS and LESS hysterectomy can be performed safely and seem to be associated with halving of early postoperative pain, with a lower request of analgesia compared with standard laparoscopy.[15]

To our knowledge, there are no reports about total M-LPS radical hysterectomy. The following are our preliminary results and surgical technique obtained with total M-LPS radical hysterectomy in ECC patients.

MATERIALS AND METHODS

Between January 1, 2012 and March 25, 2012, 19 cervical cancer patients were referred to the Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, Catholic University of the Sacred Heart in Rome, Italy. All of these patients were prospectively evaluated for M-LPS treatment. Inclusion criteria were FIGO stage IA2-IB1 cervical cancer with no evidence of lymph node and/or adnexal and/or corpus uteri involvement at computed tomography/magnetic resonance imaging; uterine size <12 weeks' gestation; no history of previous xifo-pubic abdominal major laparotomic surgery (laparotomy for peritonitis, bowel resection, etc); body mass index (BMI) <35; and American Society of Anesthesiologists score <II.

Our institutional review board approved the study, and patients were informed about the M-LPS technique and signed a written informed consent acknowledging the risk of standard laparoscopic and/or laparotomic conversion. The same surgical team (1 experienced surgeon, 1 fellow, and 1 resident) performed all of the interventions.

Patient demographic (age, race), surgical (type of hysterectomy, operative time, blood loss), and postoperative (complications, discharge, bladder voiding function, ileus) data were prospectively collected. Clinical (BMI, previous neoplasms) and diagnostic information regarding actual disease (stage, grade, histotype, lymph nodes, residual disease) were also noted from paper patient charts and electronic medical records. Operative time (OT) was defined as the interval between incision start and closure. Operative complications were defined as bowel, bladder, ureteral, or vascular injuries, and an estimated blood loss (EBL) ≥500 mL. Anemia was considered when hemoglobin level was <8 g/dL, and fever was considered when body temperature was at least 38 °C in 2 consecutive measurements at least 6 hours apart, excluding the first day after surgery.

Patients were discharged home when they were fully mobile, apyrexial, and could pass urine satisfactorily. Early postoperative complications were defined as any adverse event that occurred within 30 days after surgery, and they were considered severe if they resulted in unplanned readmission, blood transfusion, or a secondary surgical procedure.

Surgical Instruments and Technique

Surgical procedures were performed with one disposable optic-view transumbilical 10-mm port (Endopath Xcel 10-mm optic-view; Ethicon Endo-Surgery, Cincinnati, OH). A 10-mm 0 ° HD-videolaparoscope (Endoeye; Olympus Winter & Ibe GmbH, Hamburg, Germany) was inserted in the umbilical port. Patients under general anesthesia were positioned in the dorsal lithotomic position with both legs supported in Allen stirrups with a Trendelenburg tilt. A reusable intrauterine manipulator (Karl Storz, Tuttlingen, Germany) was used to move the uterus. Once pneumoperitoneum (12 mm Hg) was achieved, 3 additional 3.5-mm reusable ports with conical tip were inserted, and 3-mm operative instruments (Karl Storz) were used **(Figure 1)** from choices of dissecting and grasping forceps, monopolar scissors or spatula, suction and irrigation tube (Karl Storz), and 2 types of bipolar coagulator (Take-Apart bipolar coagulating forceps [Karl Storz] and PK Molly forceps [Gyrus ACMI, Hamburg, Germany]. Monopolar scissors/hook/spatula were inserted into the suprapubic port; bipolar forceps were inserted into the left port; and the right port was used for grasping or as a suction/irrigation device. The disposition of the instruments did not change during the intervention. After pelvic and abdominal exploration and washing, the operations started with opening of the pelvic retroperitoneal spaces. Paravesical and pararectal spaces were developed with blunt dissection. Systematic removal of external iliac and obturator nodes was performed by a combination of bipolar forceps and monopolar scissors/spatula **(Figure 2)**. A free endo-bag was inserted through the umbilical port

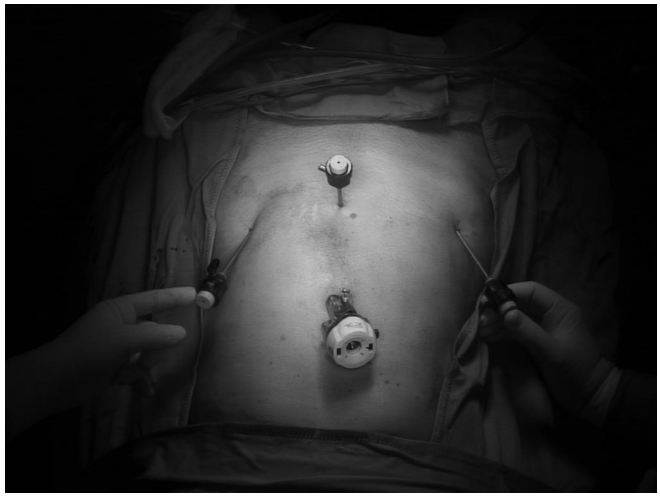

Figure 1. External vision of the surgical field: one 10/12-mm umbilical port and three 3-mm ancillary ports.

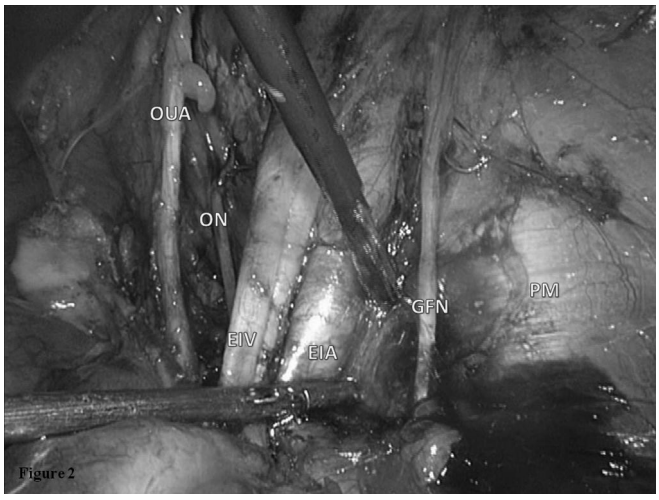

Figure 2. Right pelvic lymphadenectomy. EIA = external iliac artery; EIV = external iliac vein; GN = genitofemoral nerve; ON = obturator nerve, OUA = obliterated umbilical artery, PM = psoas muscle.

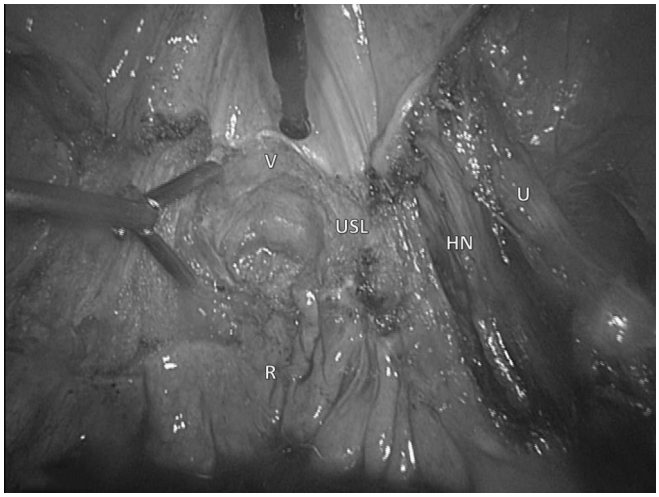

Figure 3. Dissection of the posterior paracervix. HN = hypogastric nerve; R = rectum; U = ureter; US = uterosacral ligament; V = vagina.

after removing the camera; then after replacing the camera, lymph nodal specimens were put into the endo-bag, removed throughout the umbilical port after removing the camera again, and sent for frozen section analysis. The uterine artery was identified, coagulated, and sectioned at the origin from the umbilical artery with bipolar forceps. The uterosacral ligament was transected after separation of the hypogastric nerve after Okabayashi's pararectal space development with combination of mono- and bipolar instruments **(Figure 3)**. The paracervical tissue and the uterosacral ligaments were transected combining mo-

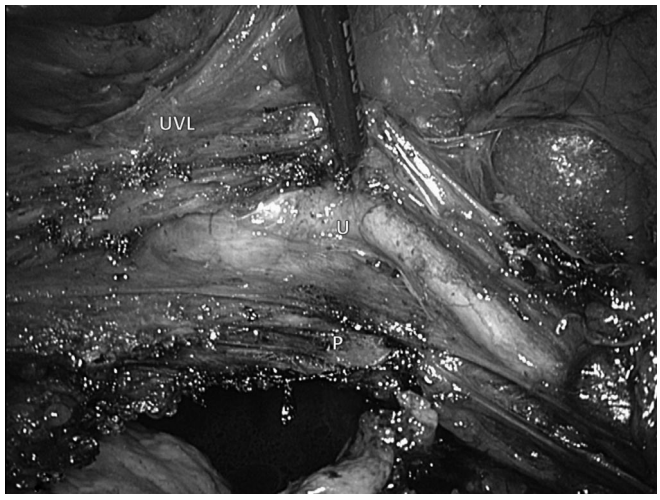

Figure 4. Dissection of the right paracervix after uterine artery section and ureteral tunnel development. P = paracervix; U = ureter; UVL = uterovesical ligament.

nopolar and bipolar devices with the "vessel by vessel" technique. Dissection of the ureteral tunnel and vesicovaginal spaces was accomplished with monopolar and blunt technique and with the aid of bipolar coagulation **(Figure 4)**. At that point, the vaginal wall was identified and transected with a monopolar hook using pure section energy to avoid postoperative ureteral and bladder complications. The specimens were removed vaginally. The vaginal cuff was then closed by laparoscopy with 0 polyglactin running sutures using a 3-mm needle holder (Karl Storz). A hydropneumatic test for bladder integrity was performed at the end of the procedure. The laparoscopic access point was not sutured but was closed only with steri-strips. Radical hysterectomy was classified according to Querleu and Morrow classification.[16]

RESULTS

During the study period, 4 of 19 consecutive cervical cancer patients (20.1%) met all the inclusion criteria and were enrolled in this trial. None of the candidate patients refused to be enrolled in the study.

Table 1 shows the clinicopathological and procedural characteristics of the study population. All patients were Caucasian. The median/mean age was 46/52 years (range: 45 to 70), and the median/mean BMI was 22.2/23.4 kg/m^2 (range: 20 to 28.5). Three patients were staged as FIGO 1A2 (2 of these had positive margins after cone biopsy), and the remaining patient was staged as FIGO 1B1. Three women had squamous histology, and 1 had an adenocarcinoma. Two patients had a moderate (G2) differentiated

Table 1.
Patients and Procedural Characteristics of the Study Population

Characteristics	Results
Age (y), median/mean (range)	46/52 (45–70)
BMI[a] (kg/m^2), median/mean (range)	22.2/23.4 (20–28.5)
Operative time (min), median/mean (range)	165/186 (155–215)
Estimated blood loss (mL), median/mean (range)	30/32 (20–50)
Intraoperative complications	0
Postoperative complications	0
Conversion to LPS/LPT[a] during hysterectomy	0
Ileus (days), median/mean (range)	1/1 (1–1)
Time to discharge (days), median/mean (range)	2/2.2 (1–3)

[a]BMI = body mass index; LPS = laparoscopy; LPT = laparotomy.

cervical cancer. In the other 2 patients, these data were not available before surgery, and definitive pathology found only intraepithelial neoplasia or carcinoma in situ. We performed 3 type B2 and 1 type C1 on the left and B2 on the right paracervix total M-LPS radical hysterectomy, and in all cases concomitant bilateral salpingo-oophorectomy and systematic removal of external iliac and superficial obturator nodes were performed.

The median/mean EBL and OT were 30/32 mL (range: 20 to 50) and 165/186 minutes (range: 155 to 215), respectively. No minor or major intraoperative complications were registered. All of the procedures were completed without 5-mm port insertion and without conversion. Foley catheter was removed 24 to 32 hours after surgery, and postmintional residual was <100 mL in all cases. Postoperative ileus was 1 day in all patients. The median time to discharge was 2 days from surgery (range: 1 to 3). No postoperative complications and readmissions were registered in the early (within 30 days after surgery) postoperative period, nor during the first follow-up visit (3 months after surgery). Definitive pathology confirmed clinical stage in 3 cases, and in one case, diagnosed endometrioid endometrial adenocarcinoma extended to the endocervix. The median number of pelvic lymph nodes removed was 12 (range: 11 to 15). Definitive histology confirmed frozen section analysis on pelvic nodes as all negative. The median/mean length of vaginal margin was 1.5/1.6 cm (range: 1.3 to 1.9). Resection margins were free of disease in all cases, and only the patient with FIGO stage IIA endometrial cancer underwent adjuvant radiotherapy. At this time (median follow-up time 7 months [range: 6 to 9]), no recurrences were registered.

DISCUSSION

In the recent years, more attention has focused on the role of new endoscopic techniques aimed to further minimize the invasiveness of surgical treatment and minimize possible morbidity. In this context, M-LPS and LESS could represent an upgrade of standard laparoscopy in terms of surgical trauma, postoperative pain, and less damage to women's body image with visible scars.[11–14]

In this preliminary study, we describe surgical instrumentations and technique to perform total M-LPS radical hysterectomy in ECC patients. As previously reported by Ghezzi et al,[14] for total hysterectomy, our study suggests that ports can be safely reduced in size without a negative impact on the surgeon's ability to perform radical hysterectomy. Also, considering that this is a very preliminary experience, we observed no longer OT for M-LPS with respect to standard laparoscopic radical hysterectomy and superimposable perioperative outcomes.[2,6,8] The similar OT between M-LPS and standard laparoscopy could be justified by the fact that the reduction of port and instrument size from 5 to 3 mm does not influence the surgical technique. These peculiarities of M-LPS could offer some advantages of this approach with respect to single-port surgery when performing advanced surgery as radical hysterectomy and pelvic lymphadenectomy—in particular (1) different from single-port, the surgical field is the same of standard laparoscopy, maintaining the triangularization between the instruments; and (2) the third operative instrument, managed by the second surgeon, can reduce the loss of time in some specific surgical steps. It is conceivable that, different from single-port surgery, the M-LPS technique does not require a specific learning curve.

Moreover, the smaller trocars require less force to penetrate the abdominal wall, and this allows a more controlled entry and consequently the reduction of the risk of port-related injury to both the abdominal wall and the intraabdominal organs. Nevertheless, the scar-free procedure could potentially have a significant impact on patients' body image, which is not only a cosmetic result, but is also an aid to cope with a past cancer diagnosis. Other remarkable considerations have to be taken from the oncological point of view: this preliminary experience suggests that M-LPS appears to have an adequate onco-

logical performance in terms of type of hysterectomy and number of pelvic lymph nodes removed.

As far as technical limits are concerned, we can hypothesize that the smaller (3 mm vs 5 mm) bipolar grasp dimension could be insufficient to control severe hemorrhage during paracervical vessel dissection. In our previous retrospective study comparing M-LPS, single-port, and laparoscopic hysterectomy, we reported 2 cases of additional 5-mm port insertion to control a severe hemorrhage; one of these was in the M-LPS group and the other was in the single-port group.[15] Thus, waiting for more effective 3-mm new generation devices, preventive hemostasis (ie, uterine artery closure at the beginning of the procedure), and gentle surgical technique should be recommended. Moreover, the high flexibility of such little instruments could limit the capability to perform an adequate retroperitoneal dissection in the presence of fibrosis. In this study, patients' average BMI was low, and it is possible that in the surgical management of obese patients, the reduced strength of the instruments could be a limit compared with standard laparoscopy, especially for large and small bowel traction.

In this preliminary experience, we found that in well-selected cases, M-LPS radical hysterectomy seems safe and may offer a new tool in minimally invasive surgery for ECC patients. Further large and prospective, randomized trials are needed to confirm these results and to compare this technique with standard laparoscopy to identify potential advantages for the patients.

CONCLUSION

This report suggests a role of M-LPS in the surgical management of ECC with adequate oncological results and specific advantages of a further less invasive surgery than standard laparoscopy.

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