ELSEVIER

JMIG The Journal of Minimally Invasive Gynecology

Original Article

# Laparoscopic Radical Hysterectomy and Pelvic Lymphadenectomy Can Be Routinely Used for Treatment of Early-stage Cervical Cancer: A Single-institute Experience With 404 Patients

Lu Yang, MD[1], Jing Cai, MD, PhD[1], Weihong Dong, PhD, Yi Shen, MD, Zhoufang Xiong, MD, Hongbo Wang, PhD, Jie Min, MD, Guiling Li, MD, and Zehua Wang, MD, PhD*

*From the Department of Obstetrics and Gynecology (Drs. Yang, Cai, Dong, Shen, Xiong, H. Wang, Min, and Z. Wang), and Cancer Center (Dr. Li), Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei, PR China.*

**ABSTRACT** **Study Objective:** The aim of our study was to determine if laparoscopic radical hysterectomy (LRH) can be routinely used for the treatment of early-stage cervical cancer.

**Design:** From May 2008, LRH was planned for all primarily operable cervical cancer patients after receiving informed consent in our department. The surgical and oncologic outcomes were retrospectively evaluated (Canadian Task Force classification III).

**Setting:** University teaching hospital.

**Patients and Interventions:** By August 2013, 404 patients with invasive cervical cancer were deemed operable, and all of them were subjected to upfront LRH, except 1 patient who insisted on open surgery.

**Measurements and Main Results:** The planned LRH was abandoned in 3 patients because of inoperability. The median operative time was 240 minutes (range, 100–410 minutes). The median blood loss was 300 mL (range, 50–800 mL). The median number of harvested pelvic lymph nodes was 23.5 (range, 11–54). Two patients had positive surgical margins. Intraoperative complications occurred in 7 of the patients, and a conversion to open surgery was mandatory for 2 patients (conversion rate = 0.5%). Postoperative urinary tract fistula developed in 3 patients. Sixty-nine patients underwent adjuvant therapy. The median duration of follow-up was 31 months (range, 7–69 months). Thirty patients developed recurrent disease with a median disease-free interval of 12 months (range, 6–23 months), and 24 died of disease. The estimated 3-year overall survival rate was 94.9% in the women with a tumor $\leq$ IB1 and 81.3% in those with a tumor >IB1, and the 3-year progression-free survival rates were 94.1% and 79.6%, respectively.

**Conclusion:** LRH is adequate, safe, and feasible for women with cervical cancer, and it can be routinely used for the treatment of early-stage tumors as a primary modality. Journal of Minimally Invasive Gynecology (2014) ■, ■–■ 

*Keywords:* Cervical cancer; Laparoscopic radical hysterectomy; Oncologic outcome; Surgical outcome

**DISCUSS** You can discuss this article with its authors and with other AAGL members at http://www.AAGL.org/jmig-22-2-JMIG-D-14-00404R1

Use your Smartphone to scan this QR code and connect to the discussion forum for this article now*

* Download a free QR Code scanner by searching for "QR scanner" in your smartphone's app store or app marketplace.

A laparoscopic radical hysterectomy (LRH) with pelvic and aortic lymphadenectomy was first reported by Nezhat et al in 1993 [1]. Since then, this procedure has been applied clinically in the treatment of early-stage cervical cancers. Initially, there were concerns about its time-consuming nature, questionable radicality, and technical difficulties [2,3]. However, laparoscopic surgeries offer reduced blood loss, shortened hospital stays, and an improved short-term quality of life when compared with laparotomy [4]. In the

Supported by the Key Clinical Program of the Ministry of Health, PR China.
The authors declare no conflict of interest.

Corresponding author: Zehua Wang, Department of Obstetrics and Gynecology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, 1277 Jiefang Avenue, Wuhan, Hubei 430022, PR China.
E-mail: zehuawang@163.net
[1] These authors contributed equally to this article.

Submitted August 9, 2014. Accepted for publication September 26, 2014.
Available at www.sciencedirect.com and www.jmig.org

1553-4650/$ - see front matter 
http://dx.doi.org/10.1016/j.jmig.2014.09.009

past decade, surgical oncology has been progressively evolving toward minimally invasive accesses, and numerous retrospective studies have shown that LRH was comparable with open surgery in terms of surgical outcomes and complications [5–8]. The present study sought to evaluate the feasibility and safety of LRH as the routine primary management of patients presenting with operable stage IA2 to IIB cervical cancer and to share our experiences.

## Patients and Methods

### *Patients*

From May 2008, in the Department of Gynecology and Obstetrics, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, LRH was planned for all operable cervical cancer patients. The diagnosis of cervical carcinoma was histologically confirmed in all patients before surgery. In addition, the pretreatment evaluation included a physical examination, vaginal pelvic examination, chest x-ray, and pelvic magnetic resonance imaging. Cystoscopy and/or proctoscopy with biopsy were performed in patients with suspicious bladder/bowel involvement. A positron emission tomography scan was recommended in case of suspicious distant metastasis. Moreover, adequate performance status and adequate functions of important internal organs such as renal, hepatic, cardiac, and pulmonary functions were considered to be essential for surgery. All patients were informed of the risks and possible complications of LRH and pelvic lymphadenectomy. Patients who underwent radical surgery between May 2008 and August 2013 were enrolled in the present study.

### *Patient Management*

All patients were operated on by the team of Professor Zehua Wang, which consists of 8 gynecologic oncologists. The technique of LRH has been described previously [9]. A harmonic scalpel was the main instrument for the dissection, division, and maintenance of hemostasis of all major surgical pedicles in our department, and LRH was performed according to the C2 type of the Querleu-Morrow classification [10]. Systematic bilateral pelvic lymphadenectomy included the dissection of the common iliac, external iliac, internal iliac, obturator, and deep inguinal lymph nodes. Para-aortic lymphadenectomy was not performed in these patients because intraoperative frozen section diagnosis of nodes was not carried out in our hospital because of insufficient man power.

In our surgery, when the bladder-cervical space was opened, we suggested the combination of blunt separation and sharp dissection to decrease the bladder injury. If the bladder were closely adherent to the cervix, we preferred the sharp dissection. When we found ureter or bladder invasion, we suggested stopping the operation and administering radiation therapy. When the ureter was unroofed, some important skills were adopted to avoid ureteral injury, postoperative ureteral stenosis, and fistula formation. We preserved the ureteral branches of the internal iliac artery, which nourish the ureter. Additionally, we preserved the connective tissue around the ureter as much as possible to avoid injuring the vessels of the tunica vaginalis, which was 1 of the key facets of the procedure to protect the patients from postoperative ureteral peristalsis. Furthermore, we particularly avoided heat injury. We preferred increasing the grip pressure and tension application when cutting the tissue to decrease the time of the procedure and, thus, decrease heat injury. We also held the function blade as far away from the ureteral and the protected tissue as possible to minimize heat damage; this should also be applied during lymphadenectomy.

In all patients, the urine catheter was removed 10 days after surgery, and the bladder function was assessed by performing postvoid residual catheterizations. In patients with a residual urine volume of more than 100 mL, the bladder was recatheterized until the resumption of normal voiding.

Adjuvant therapy was given in 2 circumstances: (1) patients with lymph node metastasis, parametrial involvement, or positive surgical margins and (2) patients with 2 or more intermediate risk factors (i.e., lymphovascular space involvement, deep stromal invasion, and tumor size $\geq$2 cm). The adjuvant radiotherapy was performed in the cancer center of our hospital. Concurrent platinum-based chemotherapy was administered in most patients undergoing adjuvant radiotherapy since 2012.

After surgery, patients underwent follow-up examinations every 3 months for 2 years, every 6 months in the third year, and once a year thereafter. The contents of the follow-up examinations included a gynecologic examination; a vaginal stump brushing cytologic examination; ultrasound examinations of the pelvis, kidneys, ureters, and bladder; and a chest x-ray.

### *Data Collection and Definitions*

Medical records were reviewed to collect data regarding disease and therapy. The following parameters were recorded: age, body mass index, Fédération Internationale de Gynécologie et d'Obstétrique (FIGO) stage, tumor size (diameter of the largest dimension of the primary tumor), histopathologic subtype, tumor grade, and involvement of the lymph nodes and parametrium. Intra- and perioperative parameters included operative time, estimated blood loss, lymph node count, status of the surgical margins, intraoperative complications, and early postoperative complications.

The operative time was measured from the first incision to the final suture. The blood loss was measured as the sum of the suctioned fluids and the weight of the sponges minus the use of irrigation fluids at the completion of the surgery. Intraoperative complications were defined as injury to the intestines, bladder, ureters, or great vessels. Early postoperative complications were defined as those that occurred within 30 days of surgery. A bladder