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*Original Article*

# Clinical observation of laparoscopic radical hysterectomy for cervical cancer

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**Abstract:** To evaluate safety, feasibility and the improvement of surgical method of laparoscopic extensive hysterectomy and pelvic lymph node dissection in patients with early-stage cervical cancer. Clinical data were prospectively collected from patients with IA2-IIA cervical cancer who underwent laparoscopic extensive hysterectomy (n1=22) and laparotomy (n2=23) in Department of Obstetrics and Gynecology in the Subei People's Hospital from June 2010 to August 2013. The successful rates in two groups of operation were 100%. Blood loss, postoperative hospital stay, complication rate, postoperative recovery of gastrointestinal tract and bladder function of the laparoscopy group of the laparoscopic group were all better than those of the laparotomy group, and there were significant differences (all $P < 0.05$). But in the laparoscopy group, the operative time was longer than the laparotomy group with statistical significance ($P < 0.05$). There was no statistically significant difference in the number of excised lymph nodes and the duration time of postoperative urinary catheterization between the two groups ($P > 0.05$). Laparoscopic extensive hysterectomy and pelvic lymph node dissection can fully meet the requirement of laparotomy. It has the properties of minor trauma and rapid recovery. The clinical efficacy is superior to laparotomy surgery. The results indicated laparoscopic is an ideal method for the treatment of early cervical cancer.

**Keywords:** Laparoscopic surgery, cervical cancer, clinical efficacy

## Introduction

Cervical cancer is the second most common and the third leading cause of cancer fatalities among women worldwide [1]. In China, cervical cancer is the most common gynecologic cancer among women [2]. In early cervical cancer, radical hysterectomy has been considered the standard treatment method [3]. And the open radical hysterectomy (ORH) and lymph node dissection is the mainstream surgical treatment in the early 1900s [4]. Over the last decade, laparoscopic radical hysterectomy (LRH) has evolved as a new operative technique for the management of early cervical cancer. Laparoscopy has revolutionized the practice of gynecologic surgery. For the treatment of gynecologic malignancies, applications of advanced laparoscopic techniques continue to be defined. More recently, the morbidity and mortality rates associated with the newer technique have been examined by many researchers [5-9]. In this research, we compare a group of women who underwent laparoscopic radical hysterectomy for early stage cervical cancer to a matched cohort that underwent open radical hysterectomy and evaluate the surgical outcomes for both groups.

## Material and methods

### *Patients*

We reviewed the records of all patients with stage IA1 to IIA cervical cancer who were treated and followed up between June 2010 and August 2013 at Subei people's Hospital in China. We excluded patients who received radiation or concurrent chemoradiation therapy as primary treatment, as well as those who received neoadjuvant chemotherapy, radiation, or concurrent chemoradiation therapy before radical hysterectomy, and those we lost their contact in the follow up. Finally, 45 cases entered into our study. Of all them, 22 patients

**Table 1.** Patient characteristics, histology and stage

| | Laparoscopy (n1=22) | Laparotomy (n2=23) |
|---|---|---|
| Mean age, years (range) | 44 ± 1.5 | 46 ± 2.3 |
| Stage | | |
| IA2 | 1 | 2 |
| IB1 | 13 | 9 |
| IB2 | 3 | 8 |
| IIA | 5 | 4 |
| Histology | | |
| Squamous | 19 | 19 |
| Adenocarcinoma | 2 | 1 |
| Adenosquamous | 0 | 1 |
| Other | 1 | 2 |

underwent laparoscopic radical hysterectomy, and the rest underwent open radical hysterectomy in a similar clinical setting with the same surgical team was conducted, Patient characteristics are presented in **Table 1**.

*Operation*

ORHL: Open radical hysterectomy and lymph node dissection was performed as routine.

LRHL: The abdomen is insufflated $CO_2$ through a Veress needle just above 3 cm of the umbilicus where an 11-mm camera port is introduced to exposure the Pelvic lymph node , the pressure is 13-15 mmHg. One 8-mm Troca is introduced at the level of and 10 cm laterally to the supra-umbilical incision. The other two 8-mm robotic ports are introduced on the McBurney point and anti-McBurney point. The patient is then placed in extreme Trendelenburg position. After exploring the Pelvic organs elaborately, the radical hysterectomy is started by dissection of the ovarian vessels and uterine artery by bipolar coagulation and selective coagulation and cutting. Firstly, the round ligaments are then coagulated and cut, dissecting the broad ligament of uterus, and then cut the infundibulopelvic ligament. If the patients are young and they want to reserve fertility and the ovaries seem normal, we leave the hemi-ovary or bilateral ovaries selectively. To those old and who don't require fertility, we cut the bilateral ovaries and tuba uterina. The procedure then continues with opening of the retroperitoneum lateral to the external iliac artery and all spaces paravesical and pararectal as well as the obturator fossa are opened in search for the Pelvic lymph nodes. The ureters are mobilized to the level of the ureteric tunnel. Opening the paravesical, fully exposed the main ligament and uterine artery above it, transect the uterine artery and 3-4 cm main ligaments with the Ultrasonic scalpel Opening the pararectal with Ligasure forceps, exposed the sacral ligament, then transect it more than 2.5 cm with the Ultrasonic scalpel. Place the Uterus lifting cup to ensure to cut the enough vaginal (**Figure 1**).

*Follow up*

Follow-up consisted of a pelvic examination every 3 months during the first two years, three times a year from the third to the fifth year, and annually thereafter. TCT and HPV tests were performed every year. X-ray and CT were performed when necessary.

Statistics analysis: Statistical analysis was done using the statistical software package SPSS 19.0 and Excel 2007. The outcome for laparoscopic and open groups were compared using the Chi-square test and Fisher extract test for categorical variables and two sample student t test for continuous variables. A *P* value of 0.05 was considered significantly.

## Results

1. Average operating time was 238.6 minutes for the laparoscopic cases and 201.4 minutes for open cases ($P < 0.05$). The mean estimated blood loss was 202.5 mL for laparoscopic versus 286.6 mL for laparotomy ($P < 0.05$). The average length of stay was 8.3 days versus 10.2 days ($P < 0.05$). Shown in **Table 2**.

2. There were two patients in the laparoscopic had urine retention, as well as two in the open group ($P > 0.05$). No patients in the laparoscopic group and 1 in the open group had a postoperative wound infection ($P < 0.05$). There were no noted damage of bladder in either group ($P > 0.05$). One in the laparoscopic happened Lymphatic Cyst, and one in the open group ($P < 0.05$). Shown in **Table 3**.

3. The function of bladder (Grade 0, Grade I, Grade II) were 68.2%, 22.7% and 9.1%, respectively, in the laparoscopic. 26.1%, 26.1%, 47.8% in the open group ($P < 0.05$). The time to evacuating and defecation in the laparoscopic were

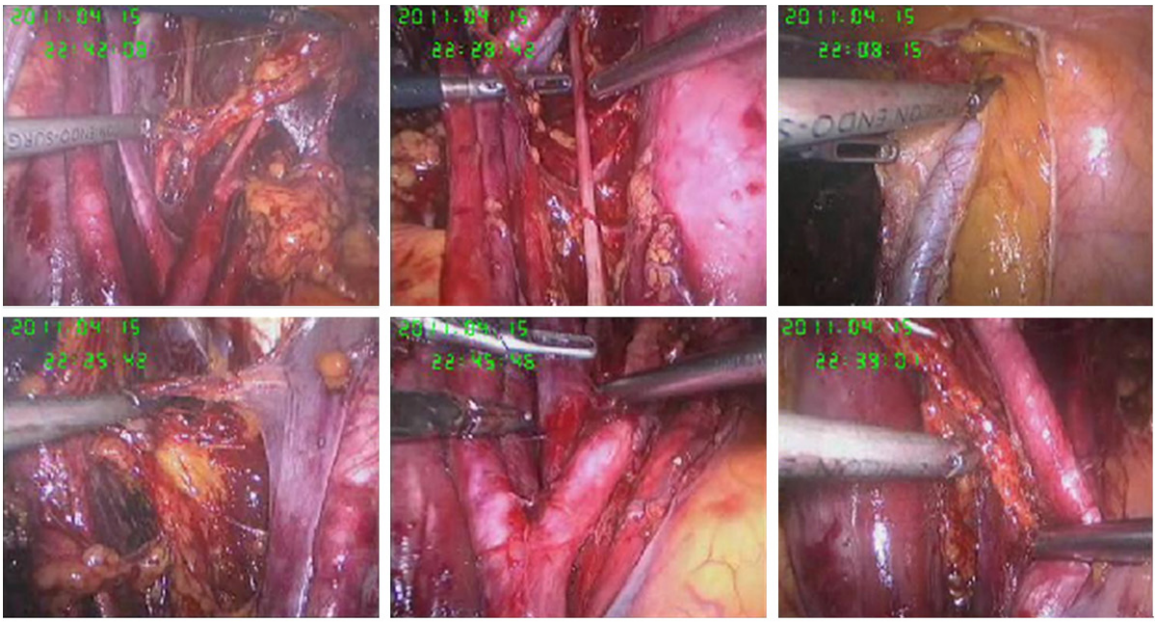

**Figure 1.** The methods of laparoscopic radical hysterectomy and lymph node dissection.

**Table 2.** Comparison of the theatre time, lymph nodes removed, blood loss, hospital stay for two groups of patients

| | Laparoscopy (n1=22) | Laparotomy (n2=23) |
|---|---|---|
| Duration, min (range) | 238.6 ± 122.7 | 201.4 ± 86.2 |
| Blood loss, ml (range) | 202.5 ± 44.2 | 286.6 ± 33.9 |
| Lymph nodes resected | 18.9 ± 3.2 | 18.2 ± 2.8 |
| Postoperative hospital stay (range) | 8.3 ± 2.4 | 10.2 ± 1.8 |

**Table 3.** Complications for two groups

| | Laparoscopy (n1=22) | Laparotomy (n2=23) |
|---|---|---|
| urine retention | 2 | 2 |
| Infection of incision | 0 | 1 |
| Lymphatic Cyst | 1 | 1 |
| Damage of bladder | 0 | 0 |
| Rate of complications | 13.64% | 17.39% |

longer than in the open group ($P < 0.05$). Shown in **Table 4**.

## Discussion

Treatment of early cervical cancer with surgery, including radical hysterectomy and pelvic lymphadenectomy. Traditional open surgery due to trauma, recovery slow, long hospital stay and other shortcomings are increasingly being replaced by minimally invasive surgery. With more and more advanced surgical instruments, continue to accumulate experience, technology has become more sophisticated, laparoscopic surgery has been widely used in early cervical cancer cure [10]. Many scholars believe that laparoscopic surgical resection, number of lymph node dissection and postoperative 5-year recurrence rate reached laparotomy results.

In 2007, K. ZAKASHANSKY et al [11] conducted a retrospective study of clinical cases, including 30 cases of early cervical cancer patients underwent open surgery, and 30 cases underwent laparoscopic surgery. The results showed that regardless of the amount of blood loss, intraoperative lymph node dissection during surgery or in the number of hospital days, the laparoscopy is superior to open surgery. They account that laparoscopic treatment is applied early cervical cancer is safe and reliable, it is recommended. However, the average operative time was significantly longer than the laparoscopic group open group. In a study done in 2009 the results obtained Mario Malzoni etc [12] almost the same with K. ZAKASHANSKY outcome. Early 2013 Lu Qi et al [13] reported a radical hysterectomy and pelvic lymph node dissection in 25

**Table 4.** Comparison of the functions of the bladder and rectum for the post-operation patients

| | the function of bladder | | | Recovery time (h) | |
|---|---|---|---|---|---|
| | 0 | I | II | evacuating | defecation |
| Laparoscopy (n1=22) | 15 (68.2%) | 5 (22.7%) | 2 (9.1%) | 5.6 ± 2.3 | 64.2 ± 10.9 |
| Laparotomy (n2=23) | 6 (26.1%) | 6 (26.1%) | 11 (47.8%) | 9.4 ± 1.9 | 118.8 ± 15.6 |
| Value *P* | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |

patients with early cervical cancer patients undergoing laparoscopy, the average operative time was 232 min, mean intraoperative blood loss was 120 ml, the average hospital stay was 3.3 days day, everyday activities can be performed after a median time of 2 days, intraoperative accident occurred. Postoperative voiding dysfunction in which a person has suffered, and one person found asymptomatic lymphocele after nine months at the time of the review. In recent years, our hospital laparoscopic radical hysterectomy and pelvic lymph node dissection, and actively improve on the traditional operation. 1. Fully exposed to the bladder, rectum side nest, it is easier to achieve removal of the uterus sacral ligament and cardinal ligament standards. 2. Place cite Palace, a more exposed uterosacral, cardinal ligament, ureter, blood vessels, so that the anatomical clarity and avoid unnecessary surgery injury. 3. When removal of the uterus, displacement cite Palace cup, can stretch the vaginal wall, the expansion of the vaginal vault, cut a sufficient length of the vaginal wall. 100% of the surgery is successful, no vital organ injury, and death occurred without laparotomy. By comparison with the open group, the average amount of bleeding laparoscopic surgery group, the average length of stay, and the average time to pull the catheter body injury indicators are better than the laparotomy group and similar to the above-mentioned literature. And we found that the difference between the two groups in intraoperative lymph node dissection was not statistically significant numbers. Laparoscopic surgery longer than the laparotomy group, which is the extent of surgical instruments and skilled surgeon about. After conventional treatment with low molecular weight heparin, no cases of deep vein thrombosis. In laparoscopic group 2 cases of postoperative urinary retention, complete remission after aggressive treatment, 1 case of wound infection, may be associated with physical and other relevant. The overall postoperative complication rate was 9.38%, significantly lower than the open group (12.9%), which advanced experience of others with us and actively improve innovation are not unrelated. By comparison we found that the bladder, rectum functional recovery after laparoscopic group was significantly faster than the laparotomy group, which can look laparoscopic pelvic structure, rectum, bladder injury related small.

In addition, there are the following advantages of laparoscopic surgery. (1) Organization enlarge laparoscopic surgery vision more clearly exposed. Especially in the obturator fossa lymph dissection of adipose tissue, and its advantage is more obvious, greatly reducing the bleeding obturator nerve injury and obturator fossa damage caused by arteriovenous; (2) laparoscopic tissue amplification can be found in small lesions laparotomy difficult to find; (3) laparoscopic lymphadenectomy avoid laparotomy stripped bare organizations and other operations, reducing the incidence of abdominal and pelvic adhesions; (4) laparoscopic surgery in the abdominal wall drilling, the prognosis does not affect the appearance, patients are willing to accept.

In 2000, the specialist of the Netherlands introduced the laparoscopic pelvic lymph node dissection (LPLND) with sentinel node (SN) detection for the surgical treatment of FIGO Ia2-IIa cervical cancers [14]. When the SN contains a metastasis, the operation is abandoned, and the patient subsequently receives chemo-radiotherapy. The aim of this approach is to reduce the number of patients undergoing radical hysterectomy followed by chemo-radiation as this leads to substantially more morbidity than either treatment alone, without obvious better survival [15, 16].

According to Cai YH et al, laparoscopic surgery for cervical cancer causes less postoperative stress than conventional open surgery. They measured the serum interleukin 6, C reaction protein and cortisol in the blood from the patients, samples were obtained prior to surgery and at 1 and 2 h into the operation, as well as on days 1, 4 and 7 following surgery [17].

Summary, Laparoscopic surgery is safe, effective and feasible, are more and more accepted gynecologist, gradually replaced open surgery position in early cervical cancer treatment, we are actively in the process of learning and innovation also found some new issues, pending further study.

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## Disclosure of conflict of interest

None.

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