

Radical Vaginal Trachelectomy Combined with Laparoscopic Pelvic Lymphadenectomy

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ABSTRACT

Objective: To describe the procedure of radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy, its safety, and side effects for treatment of early stage cervical cancer in patients who met the procedure's criteria.

Methods: This study was conducted on 10 patients with early stage cervical cancer at Charite Campus Benjamin Franklin-Germany between February 2011 and February 2012. A total of 10 patients were studied according to the protocol, all of them underwent radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy for early stage cervical cancer and where seeking parenthood and followed up for its safety, and side effects.

Results: Radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy was an easy procedure with minimal blood loss; the average operating time was about 181 minutes, 80% of cases were squamous cell carcinoma, diagnosed by cone biopsy, while 20% were adenocarcinoma diagnosed by punch biopsy. Two cases were complicated by postoperative pelvic abscess and urinary tract infection and were managed accordingly.

Conclusion: Radical vaginal trachelectomy combined with laparoscopic lymphadenectomy was a safe procedure with minimal side effects for preserving fertility in patients with early stage cervical cancer provided it was performed by experienced surgeons.

Key words: Cervical cancer, Laparoscopic pelvic lymphadenectomy, Radical vaginal trachelectomy.

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Introduction

Radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy is a procedure established in the past two decades for treatment of early stage cervical cancers in patients' still seeking parenthood, it was first described by Dargent in 1994⁽¹⁾ as an alternative to classical radical hysterectomy or chemo radiation for patients who want to preserve fertility and can fulfill the inclusion criteria.⁽¹⁻³⁾ This procedure is safe for the patients in terms of perioperative short and long term complications, five year recurrence- free and overall survival

rates are excellent with 97% and 98%, respectively.⁽⁴⁾ The survival and relapse rates for radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy for those patients who are matching inclusion criteria and even the oncological safety are at least equal to those of abdominal radical hysterectomy or laparoscopic approaches.⁽⁵⁻⁷⁾ Because more than 25% of women with cervical cancer are younger than 40 year in countries with high income, the age of nulliparous women has increased in the last years, and the need for fertility preserving procedures becomes an urgent issue, especially

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Table I: Criteria to select patients for radical vaginal trachelectomy

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- Confirmed invasive cervical cancer: Squamous, Adenocarcinoma, or Adenosquamous
 - FIGO stage IA1 with lymphovascular space involvement, FIGO IA2 L0 or L1V0 to IB1 L0 or L1V0
 - Desire to preserve fertility
 - Lesion size ≤ 2 cm
 - No previous history of infertility
 - Limited endocervical involvement at colposcopy (R0 resection possible with surgical margin ≥ 5 mm)
 - Estimated length of remaining cervix ≥ 1 cm
 - Post conization adequate resolution of acute inflammation required (usually 6 weeks interval between conization and radical trachelectomy)
 - Negative pelvic lymph node status.
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since the pregnancy rate after this procedure is adequate.^(8,9) Despite the previously mentioned advantages of this procedure, it is worthy to mention that it's not without complications as any other operation and injury to the ureter, bladder, and rectum may occur since about half of the para cervical tissue has to be removed.

There are many patients with early cervical cancer who meet the criteria for radical vaginal trachelectomy and laparoscopic pelvic lymphadenectomy. Sonoda *et al.*⁽¹⁰⁾ estimated that 48% of women of reproductive age with early cervical cancer would meet the criteria for preservation of the uterus. In this study we aim to explain the technique of radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy, its safety, and complications of this procedure.

Methods

Between February 2011 and February 2012, 10 patients at Charite Campus Benjamin Franklin were enrolled in this study. All patients fulfilled the following criteria: age ≥ 18 years, histopathologically confirmed cervical cancer (squamous, adenosquamous or adenocarcinoma, FIGO stage 1A1, 1A2 or 1B1 with its diameter ≤ 2 cm). In addition, all patients still wanted to be pregnant or preserve their ability of fertility. Exclusion criteria were: preoperative diagnosis of nodal metastasis or previous pelvic lymphadenectomy, pregnancy, estimated tumor diameter of more than 2 cm or neuroendocrine tumor type. These criteria were summarized in Table I.⁽¹⁰⁾ The procedure was performed with the patient in lithotomy and Trendelenburg position under general anesthesia with the use of endotracheal intubation. It was started with insufflation of peritoneal cavity with 3-4 liters of

carbon dioxide and a 10mm intraumbilical trocar was inserted, two 5mm trocar were inserted about 2cm above and medial to anterior superior iliac spine, the fourth 5mm trocar was inserted about two fingers above symphysis pubis. Sentinel lymph node harvesting was done and only in case that no sentinel was detected complete laparoscopic pelvic and parametric lymph node dissection was done.⁽¹¹⁾ Lymph nodes were sent for frozen section, if the result was negative for lymph node metastases, then the vaginal part of the procedure was performed. During the vaginal phase, about 1.5-2cm of the vaginal cuff all around the cervix was dissected and sutured over the tumor, Pouch of Douglas was opened with bilateral resection of rectal pillars. The paravesical spaces on both sides were opened with identification of the ureter in the ureterovesical ligament using the click maneuver and resection of the infraureteral bladder pillars was performed. The medial half of the cardinal ligament and about two thirds of the cervix were resected leaving just about 1 cm cervix in situ. Resection borders of this procedure are shown in Fig 1.

A permanent cerclage was placed all around the remaining cervix and the vagina was sutured to the cervical stump by multiple interrupted sutures. A Fehling catheter was placed and fixed to the endocervical canal to preserve its patency and removed one week later. The steps of this procedure are summarized in Table II.

Results

Radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy including the sentinel concept was carried out in all patients in this study. The median age for these patients was 32(26-39) years. Nearly all, except two of

Table II: Steps of Radical Vaginal Trachelectomy

- Apply 6 straight Kocher clamps to vaginal skin
- Incise and dissect vaginal mucosa with suturing of vaginal cuff over the cervix
- Apply serrated clamps to vaginal cuff
- Dissect rectovaginal space and open the cul de sac
- Transect lower part of rectal pillars
- Open the anterior peritoneum and apply four clamps: at 1 and 3 o'clock and at 9 and 11 o'clock
- Enter paravesical space and place a narrow Breisky retractor
- Identify ureter using click maneuver and transect infraureteral bladder pillar
- Identify and push ureter laterally and cranially
- Transect and ligate rectal pillars and then cardinal ligament
- Transect cervix at isthmic level and do endocervical curettage
- Place a catheter in uterine cavity and fix it with the cervix
- Make a modified cerclage suture and suture uterine isthmus to vagina
- Laparoscopic control to check for hemostasis, control ureter and place drain

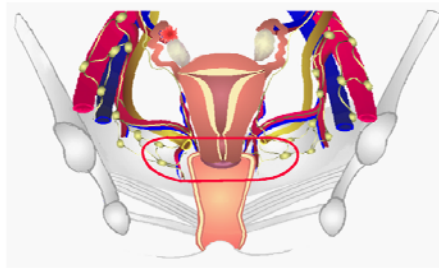


Fig 1: Resection margins of radical vaginal trachelectomy

the patients had never been pregnant before. Cervical cancer was diagnosed by cone biopsy in eight (80%) and by punch biopsy in two (20%) patients. The average operating time for this procedure was about 181 minutes which includes the time required for the pathologic result of pelvic lymph nodes frozen section. The blood loss was difficult to estimate and mostly occurred during the vaginal part of the procedure mainly from the vaginal cuff and during separation of the parametrium; but no blood was transfused to any patient in this study. The patients in this study were distributed according to the stage of cancer as follows: 1A1=1, 1A2=3, 1B1=6. The size of the cancer was ≤ 2 cm and lymph nodes were negative. Average duration of postoperative hospital stay was about six (3-10) days. Squamous cancer was diagnosed in eight (80%) patients, while adenocarcinoma was present in two (20%) patients. The parameters of the patients in this study are illustrated in Table III. Although more than half of the intraoperative complications of this procedure were known to be bladder and ureteric injuries, no patient in our study was complicated by these injuries since the bladder and ureter were separated and dissected

under vision. The second most common complication was vascular injuries either during laparoscopic pelvic lymphadenectomy with trauma to the iliac arteries or trauma to the parametrium during vaginal part of the procedure. In our study no case was converted to laparotomy because of vascular injuries or for any other reason and there were no injuries to rectum or bowels. Although there was no major complications in our study, there were two cases with postoperative problems: one patient developed postoperative lower abdominal pain with fever for whom diagnostic laparoscopy was done and revealed pelvic abscess in the Pouch of Douglas which was drained and the patient recovered with antibiotics, one patient developed postoperative fever and was diagnosed with urinary tract infection was treated accordingly.

Discussion

Radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy is described as a safe, effective procedure for preserving fertility in patients with early stage cervical cancer with lower intra- or postoperative

Table III: Parameters of patients who underwent radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy

Patient No	Age	Gn Pn	Stage of Ca	Length of stay	Method diagnosis	Histologic type	Operation time(min)
1	31	G1P1	1B1	5	Cone	Squamous	184
2	28	G0P0	1B1	3	Cone	Squamous	161
3	28	G0P0	1A2	3	Cone	Squamous	241
4	32	G0P0	1A1	8	Cone	Squamous	231
5	26	G0P0	1B1	7	Cone	Adenocarcinoma	198
6	32	G0P0	1B1	4	Biopsy	Adenocarcinoma	72
7	34	G0P0	1A2	6	Cone	Squamous	127
8	34	G0p0	1B1	8	Biopsy	Squamous	156
9	37	G1P1	1A2	10	Cone	Squamous	225
10	39	G0P0	1B1	5	Cone	Squamous	219

complications rate compared with those for radical hysterectomy⁽¹²⁾ and with similar oncological safety to radical hysterectomy.⁽¹³⁾ The fertility rate after this procedure was about 30% in one study⁽¹³⁾ and even higher in others reaching about 65%.⁽¹⁴⁾ It is important to know the local growth pattern of cervical cancer which tends to spread laterally to the parametrium and inferiorly to the upper vagina in a way that the uterus is spared to preserve fertility.⁽¹⁵⁾ Alexander- Serfe and his colleagues⁽¹⁶⁾ compared complications associated with radical vaginal trachelectomy and radical hysterectomy and found that this procedure has markedly less morbidity and the patients are discharged from the hospital earlier than patients who underwent radical hysterectomy. The only criticism of this procedure is the long operative time which can be reduced by the good experience of the gynecological oncologist and by decreasing the time of waiting for the result of pelvic lymph node frozen section. The recurrence and mortality rates in patients with negative lymph nodes and tumor size less than 2 cm in diameter with stromal invasion less than 10 mm and without lymphovascular invasion is similar to radical hysterectomy and pelvic lymphadenectomy,⁽¹⁷⁾ the recurrence and mortality rates after this procedure is estimated to be 4% and 2% respectively.⁽¹⁸⁾ In our study, no urinary tract, blood vessels, or bowel injuries

occurred during surgery, and there was no conversion to laparotomy in any case, although the rate of injuries and perioperative complications for this procedure varied between 2.1% and 25% in some studies⁽¹⁹⁾ and which proved that even major intraoperative injuries to urinary tract or bowel were managed during primary surgery are without negative outcome to the patients. The patients are followed up regularly after discharging by history and physical examination with (pap) smear and colposcopy to detect any complication earlier and manage accordingly. Radical vaginal trachelectomy combined with laparoscopic pelvic lymphadenectomy is a safe procedure with minor side-effects for patients with early stage cervical cancers and fertility preserving wishes who fulfill its criteria.

Conclusion

Radical vaginal trachelectomy combined with laparoscopic lymphadenectomy was a safe procedure with minimal side effects for preserving fertility in patients with early stage cervical cancer provided it was performed by experienced surgeons.

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