



## Original Article

## Radical trachelectomy for early stage cervical cancer: A case series and literature review



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## ABSTRACT

**Objective:** Radical trachelectomy (RT) is an alternative treatment for preserving fertility in patients with cervical cancer. Because women with operable cervical cancer opting for fertility preservation are scarce, few cases have been reported in Taiwan. Here we report our cases series.

**Materials and Methods:** We retrospectively evaluated seven patients who underwent vaginal RT and three patients who underwent abdominal RT in a single medical institute for a median follow-up period of 5 years.

**Results:** The oncological outcome was highly satisfactory. All patients survived and are currently disease-free, except for two who had recurrence and received additional concurrent chemoradiation therapy. Other complications included urinary tract infection, cervical stenosis, and unilateral hydronephrosis. All complications were manageable with little long-term effects. However, no pregnancy was observed during the 5-year follow-up period.

**Conclusion:** RT is considered a complicated surgical procedure among gynecological operations. Here we review the literature and describe several factors associated with higher pregnancy rates.

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## Introduction

The incidence of cervical cancer has declined since the implementation of the National Health Insurance program in Taiwan in 1995, and it has dropped from 20.1/100,000 cases in 1995 to 13.4/100,000 cases in 2012 [1,2]. In all new-onset cervical cancer cases, approximately 23% occur during fertility [2]. Radical trachelectomy (RT) is a traditional treatment option with satisfactory oncological and obstetrical outcomes. RT can be performed through a vaginal, abdominal, laparoscopic, or robotic approach and is coupled with an open or laparoscopic pelvic lymph node dissection. According to the 2014 National Comprehensive Cancer Network cervix cancer guidelines, RT can be performed in patients with early stage cervical cancer (Stage IA1 with lymph-vascular space invasion, Stage IA2, and Stage IB1) who desire fertility preservation; however, the

guidelines state, “fertility-sparing surgery for stage IB1 has been validated for tumors < 2 cm.” Vaginal RT (VRT) should not be performed in patients with tumors  $\geq$  2 cm because of a high relapse rate (22%) [3–5].

Dr. Daniel Dargent introduced RT in 1987 [6,7] and removed the uterine cervix and adjacent tissues. RT for patients with early stage cervical cancer is associated with a satisfactory live birth rate [7,8]. The pregnancy and live birth rates after vaginal, abdominal, or laparoscopic trachelectomy vary from 10% to 30%. However, the operative method appears to have improved given the recent increase in the pregnancy rate. Papers published after 2006 have reported higher conception rates [9]. The first published RT in Taiwan was in 2003 [10]. After that, we found little data on RT in Asian women. The large-series reviews are mainly in Western countries.

The aim of this article was to compare the oncologic and pregnancy outcomes of RT in the past decade in Taiwan. Based on our data and review of the literature, we propose some improvements for the surgery.

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## Materials and methods

### Study population

Between 2002 and 2015, 11 young women diagnosed with early stage cervical cancer underwent fertility-preserving RT at National Taiwan University Hospital, Taipei, Taiwan. All patients underwent preoperative magnetic resonance imaging for precise cancer staging. The inclusion criteria for candidate selection were as follows: (1) histologically proven with clinical and image Stage IA2–IB1 cervical cancer; (2) age < 40 years; (3) desiring fertility preservation; (4) no evidence of endocervical involvement; (5) no evidence of pelvic or paraaortic lymphadenopathy; (6) exclusion of unfavorable histology (small cell or neuroendocrine); and (7) tumor size < 2 cm. One patient was excluded because of an inadequate indication. All other patients received detailed consultations regarding the operation, and informed consent was obtained. We have the Institutional Review Board (National Taiwan University Hospital) approval for release of medical records for research purposes (201603010RIN).

Seven of the patients underwent VRT. However, three patients underwent abdominal RT (ART). We included these three patients for comparing the outcomes of both procedures. We retrospectively reviewed patients' medical charts and conducted telephone interviews for assessing menstrual and pregnancy conditions. Follow-up data were collected and analyzed.

### Surgical techniques for VRT

The VRT procedure applied was a modification of the Schauta-Stoeckel technique. First, the lymph nodes were laparoscopically dissected. The dissected nodes were then sent for frozen section examination to ensure their true-negative status. The vaginal region was resected at least 2 cm starting from the vaginal cuff. Subsequently, the paravesical and pararectal spaces were vaginally opened and developed for identifying the ureter in the uterosacral ligament. We resected half of the cardinal and uterosacral ligaments to free them from the surrounding tissue. The cervix was transected at the lower uterine segment with at least 5 mm of the free endocervical margin. We sutured the lower uterine segment with Mersilene (Mersilene tape, Ethicon, San Angelo, Texas, USA). The vaginal mucosa was sutured to the lower uterine segment. An 8-French rubber catheter was placed in the endocervical canal for 3 weeks. [Figure 1](#) shows the resected specimen.

### Surgical techniques for ART

The ART procedure was similar in part to a radical hysterectomy procedure. We exposed the uterus and dissected the bilateral pelvic

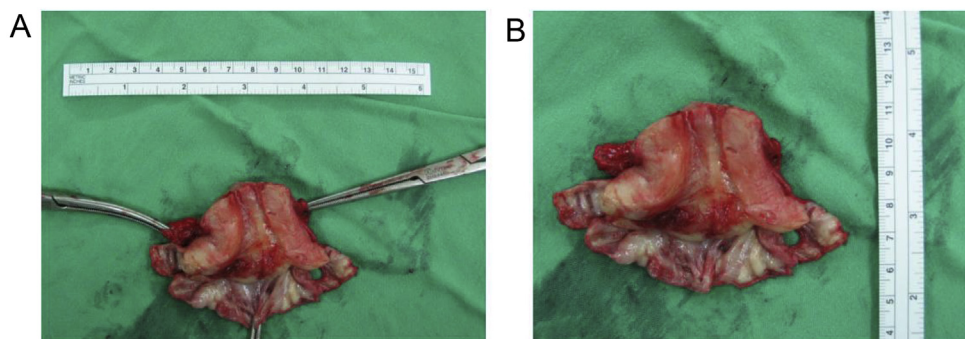
lymph nodes first. After the development of the pararectal and paravesical spaces, the bilateral parametria were exposed. The rectovaginal space was exposed, and the uterosacral ligaments were resected. We cut the cervix at the level of the isthmus including at least 2 cm of the upper vagina. Finally, we sutured the vaginal cuff with the lower uterine segment with 1-0 synthetic absorbable surgical suture (Coated Vicryl, Ethicon). Cerclage was performed vaginally as in VRT. We performed a suprapubic cystostomy before closing the abdominal wound to prevent urine retention and removed it 2–3 weeks postoperatively.

## Results

Among the remaining 10 patients, seven underwent VRT while three underwent ART. The operation time was approximately 300 minutes with little variation. Postoperative pathology revealed that seven patients had squamous cell carcinoma, and three had adenocarcinoma. Two patients had lymphovascular space invasion, and only one patient had positive lymph nodes. The average number of lymph nodes dissected was 25.7 (range, 17–48). The tumor size ranged from microscopic to as large as 3.5 cm in diameter ([Table 1](#)). Blood loss during the operation ranged from 300 mL to 800 mL. The postoperative hospital stays of patients who underwent VRT and ART were 15.8 days (10–21 days) and 17 days (13–22 days), respectively. One patient had a longer postoperative hospital stay because she was subjected to adjuvant therapy due to a positive vaginal margin. The mean follow-up period was 5.3 years.

In our case series, hydronephrosis was the main complication ([Table 1](#)). Two patients who underwent VRT developed unilateral hydronephrosis after returning home ([Table 1](#)). One case was transient and the other required regular ureter catheter replacement. One patient developed a urinary tract infection that was resolved with antibiotic treatment ([Table 1](#), No. 4). Moreover, she developed cervical stenosis and required cervical dilatation twice. We did not encounter vaginal bleeding, pelvic lymphocele, or abscess as reported in other case series. All patients had resumed menstruation approximately 8 weeks after the operation. Three patients who underwent VRT reported spontaneous abortion, and none of the 10 patients reported live birth.

Only one patient who underwent VRT and laparoscopic pelvic lymph node dissection in 2007 exhibited recurrence ([Table 1](#), No. 5). Her postoperative pathology revealed vaginal involvement, and she was diagnosed with Stage IIa1 cervical cancer. Her section margin was free, and a follow-up smear showed no abnormality. She did not require adjuvant therapy; she was regularly monitored as an outpatient after surgery. However, computed tomography performed 6 months later revealed a heterogeneous 3.8-cm diameter tumor extending from the lower part of the uterus to the vagina. Local recurrence was diagnosed. She was treated with



**Figure 1.** Vaginal radical trachelectomy specimens. (A) Cervical specimen with the bilateral parametria and vagina. (B) Cervix dissected to expose the cervical canal that is 4.3 cm in length.

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