



## Trachelectomy in Early Cervical Cancer

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### Abstract

**Objectives:** To review the role of trachelectomy as a method of fertility preservation instead of traditional radical hysterectomy in early cervical cancer.

**Materials and Methods:** We conducted our original study through research in PubMed for all original studies and reviews published in the last 10 years. We reviewed the data available on trachelectomy in early stage cervical cancer whether through abdominal route or vaginal route and laparoscopic lymphadenectomy. Moreover, we reviewed the oncologic outcome, recurrence rate and its effect on subsequent pregnancies.

**Results:** We found that recurrence and death rates seem to be comparable between radical trachelectomy (RT) and radical hysterectomy. Complications of RT include chronic vaginal discharge, abnormal uterine bleeding, dysmenorrhea, inflammation and ulcer due to cerclage, amenorrhea, and cervical stenosis. Although around 70% can get pregnant after RT, there are increased complications of pregnancy after this procedure mainly 2nd trimester miscarriages and preterm deliveries.

**Conclusion:** RT is a useful technique associated with an excellent pregnancy rate in fertility-preserving surgery to treat early stage cervical cancer. Selection of suitable patients for conservative treatment is the best important point for getting a good result without any recurrence or complication.

**Keywords:** Fertility preservation, Radical hysterectomy, Trachelectomy, Uterine cervical neoplasms

### Introduction

Cervical cancer is a malignant neoplasm arising from cells originating in the cervix uteri. It is routinely screened by Papanicolaou's (Pap) smear and human papilloma virus (HPV) is considered as one of its etiological agents. Cervical cancer is the second most common cancer in reproductive age and its diagnosis is increasing in young age as a result of effective and widespread screening programs (1). Cervical cancer is the seventh most common cancer in developed countries. In 2004, around 30,750 new cases of invasive cervical cancer were diagnosed in Europe. In 2012, around 12,170 new cases were discovered in USA and the estimated deaths were 4,220. Unfortunately, the incidence of new cases is much more in developing countries due to inefficient screening programs (2). Due to effective and widespread screening programs and the delay in child-bearing age, many women are diagnosed at a time which there is a strong demand for fertility sparing surgery (3). Radical hysterectomy and pelvic lymphadenectomy are the conventional treatment for early stage cervical cancer, but this results in loss of fertility (4). Fertility preservation is one of the most important issues to be discussed with the patient. In the last 20 years, laparoscopy assisted radical vaginal trachelectomy (RVT) and radical abdominal trachelectomy have developed that have good document-

ed long term oncological and pregnancy outcome.

RVT is a fertility-sparing technique first described by Daniel Dargent in 1994 (5), involving the removal of the cervix, the parametrium, and cuff of vagina, while maintaining the patient's uterine fundus and adnexae. This procedure, in combination with a laparoscopic pelvic lymphadenectomy, is the most common and accepted fertility-sparing procedure for early cervical cancer.

RVT begins with laparoscopic pelvic lymphadenectomy. The vaginal procedure is started by circumferential incision in the upper vagina. The supracervical ligament is cut, and the bladder base is mobilized. Posteriorly, the pouch of Douglas is opened and the pararectal spaces are exposed. The uterosacral ligaments are then divided. The vesicovaginal ligaments are then identified, and the paravesical spaces are entered laterally. Then the ureters and uterine arteries are identified. The cardinal ligaments are then divided. The cervix is amputated below the cervical isthmus (5,6).

Although RVT associated with laparoscopic pelvic lymphadenectomy is the most used surgical procedure, radical trachelectomy (RT) may be performed either abdominally or vaginally (laparoscopic or robotic).

It is estimated that around 40% of candidates for radical hysterectomy can undergo RT, but 12% of these cases will

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need adjuvant radiotherapy and radical hysterectomy due to positive frozen section or involved endocervical margin (6).

The present study was undertaken with the aim of reviewing the role of trachelectomy as a method of fertility preservation instead of traditional radical hysterectomy in early cervical cancer.

### Materials and Methods

Definite treatment of early stages of cervical cancer is radical hysterectomy. However, when fertility preservation is very important, certain methods such as RT and laparoscopic lymphadenectomy are used to rule out lymphatic metastases. Although fertility sparing surgery in early stage cervical cancer is a feasible option with good oncological and obstetrics outcome and relatively minor post-operative complication, the patient should be completely informed regarding these points.

We conducted our study in this regard through research in Pubmed for all studies and reviews published in the last 10 years. We reviewed the data available on trachelectomy in early stage cervical cancer whether through abdominal route or vaginal route and laparoscopic lymphadenectomy. Moreover, we reviewed the oncologic outcome and recurrence rate and its effect on subsequent pregnancies.

### Results

Although radical hysterectomy and pelvic lymphadenectomy are the conventional treatment for early stages of cervical cancer, it results in loss of fertility. Meanwhile, the past 20 years have seen the development of fertility-sparing surgeries for young women with early stage cervical cancer. Among these, abdominal and vaginal trachelectomy and laparoscopic lymphadenectomy are widely performed. Although less than 200 reported cases have reported the use of radical trachelectomy worldwide, early data suggests good oncological outcome.

We found that recurrence and death rates seem to be comparable between RT and radical hysterectomy. RT is performed vaginally or abdominally. The main criteria for treatment with RT are the tumor size (should not be greater than 2 cm in diameter) and that the lymph nodes should be histopathologically free of tumor tissue.

Complications of RT include chronic vaginal discharge, abnormal uterine bleeding, dysmenorrhea, inflammation and ulcer due to cerclage, amenorrhea, and cervical stenosis. Although around 70% can get pregnant after RT, there is increase in complications of pregnancy after this procedure including second trimester miscarriages and preterm deliveries, mainly because of premature rupture of the membranes.

### Discussion

RVT is a fertility-preserving operation for young women who have cervical cancer in an early stage and want to have children. The demand for RVT is increasing, because more than 40% of all cases of cervical carcinoma affect women under the age of 44. Women are increasingly hav-

ing their first child at later ages (7).

Early cervical cancer, accounts for lymph node metastasis. This means that a less radical surgery may be an oncologically safe treatment in selected cases, with the aim of preserving fertility and/or reducing morbidity without compromising survival. The extensiveness of surgery has decreased relatively in the recent decades, the "modified" radical hysterectomy still being the current gold standard by most international guidelines. Vaginal (or abdominal) RT has been proposed in association with pelvic lymphadenectomy (8).

Lakhman et al. (9) reviewed 62 patients and compared the MRI readings and final pathological report of post trachelectomy and concluded that MR imaging can help identify high-risk patients who need radical hysterectomy. One of the most important selection criteria is the strong desire for fertility preservation. In a study performed by Carter et al. (10) to assess the reproductive concerns of women treated by RT found that future childbearing was the most common reason why women choose to undergo this procedure. In a study performed by Li et al. (11) on 133 patients, all had abdominal RT and 62 had tumors more than 2 cm (2-4 cm) in size. They also found that performing trachelectomy for tumor sizes more than 2 cm did not influence the oncological outcome as no recurrence during 30.2 months follow up was observed.

Another study performed by Wethington et al. (12) on 110 patients of stage 1B1, 29 had a tumor size of 2-4 cm; 9 from this group of 29 patients underwent trachelectomy, and after a median follow up of 44 months, there was one recurrence. In a study performed by Lintner et al. (13) on 45 patients with FIGO stage 1B1-1B2, all patients with tumor size 2-4 cm had a 5-year survival of 93.5% which is comparable to radical hysterectomy. Most centers include 1B1 tumors with size less than 2 cm only (14). Tumor size more than 2 cm is not an absolute contraindication for preserving surgery. For example, an exophytic tumor more than 2 cm in size with little stromal invasion may be a candidate for RT (15).

Thus, depending on the results of studies performed by the German Society for Gynecology and Obstetrics, RVT is mentioned as a treatment option for patients with squamous cell carcinoma of the cervix of FIGO stage 1A1, 1A2, and 1B1 with less than 2 cm in size who request fertility preservation; but lymph node involvement should be excluded in all stages (16).

### *Complication, oncologic safety and pregnancy outcome of radical trachelectomy*

In a study performed by Pareja et al. 485 patients were reviewed; 9.5% had cervical stenosis, 35% had post operative complications, 16 patients (3.8%) had recurrence within the follow up period of 32 months, and 2 patients (0.4%) died of the disease. Of 113 patients who attempted to get pregnant, 67 (59%) were able to conceive (17). Lintner found that the 5 year survival rate was 93.5% and 3 out of 8 patients delivered healthy neonates (18). In a retrospective study done by Lu et al. (19), in 25 patients with ear-

ly stage cervical cancer treated by laparoscopic RT, there was no intraoperative complications but 3 postoperative complications were observed. After a median follow up of 66 months, no recurrences were observed, and 9 from 12 patients whom attempted to conceive, got pregnant.

In another study by Testa et al. (20) conducted on 25 patients with early cervical cancer managed by radical abdominal trachelectomy, there was no intraoperative complications but 6 postoperative complications were observed. There were no recurrences after follow up of 30 months. Three patients attempted for pregnancy and all of them succeeded with 3 live births. Wethington et al. (21) performed a study on 101 patients who had abdominal RT. Four patients (4%) had recurrence and lived 22-35 months after diagnosis. Of the 38 patients who attempted pregnancy, 28 patients (74%) got pregnant. A larger prospective study with long-term pregnancy and survival analyses is warranted.

### **Surgical complications**

Different studies compared surgical morbidity of vaginal RT and radical hysterectomy (22,23) and found that radical hysterectomy has more morbidity than RT regarding blood loss, analgesia requirement, hospital stay and duration of surgery.

In Beiner et al. study (24), the average intraoperative and postoperative complication rates were 4% and 12%, respectively. More than 50% of complications were bladder injury followed by vascular injuries during lymphadenectomy or trocar insertion. There are reported cases of enterotomy, vaginal fornix laceration, and ureteral injury. Lymphoedema and lymphocyst are more common in radical hysterectomy.

According to Alexander-Sefre et al. (25), certain complications are specific to RT including dysmenorrhea (24%), metrorrhagia (17%), problems with cerclage sutures (14%), dysplastic pap smears (24%), excessive vaginal discharge (14%), isthmic stenosis (10%), amenorrhea (7%), and deep dyspareunia.

### **Conclusion**

Although radical hysterectomy is the best treatment of early cervical cancer, conservative management as RT could be performed in certain conditions. RT is a useful technique associated with an excellent pregnancy rate in fertility-preserving surgery to treat early stage cervical cancer. Selection of suitable patients for conservative treatment is the most important point for obtaining a good result without any recurrence or complication.

Ongoing research efforts are especially being made in order to identify patient subsets suitable for a conservative/less radical approach and prospectively confirming the oncological safety of the proposed clinical-pathological algorithms.

### **Ethical issues**

Not applicable.

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### **Conflict of interests**

The authors declare that they have no conflict of interests.

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