

# Fertility-Sparing in Cervical Cancer

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## ABSTRACT

In all cancers, the tendency for conservative treatment is on the rise. There are several options for fertility-sparing in cervical cancer including: a) Conization, b) Simple trachelectomy, c) Radical Trachelectomy including: Vaginal, Abdominal, Laparoscopic and Robotic.

In conclusion, in young women with cervical cancer, fertility-sparing should be considered. In Conization is done in Stage 1A1 cases without LVSI. Conservative Surgery can be performed in stage 1B1 and 1A2 (Trachelectomy).

MRI should be done in the early-stage cervical cancer before fertility- sparing.

**Keywords:** Cervical cancer, Radical Trachelectomy, fertility Preservation, Conservative treatment



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## Introduction

In all cancers, the tendency for conservative treatment is on the rise.

The standard treatment for early cervical cancer is radical hysterectomy. About 46% of cases of cervical cancer are diagnosed before the age of 45 years. Fertility-sparing treatment is suggested in selected individuals by informing them about the risk of the disease and the risk of pregnancy and childbirth.

There are several options for fertility-sparing in cervical cancer including:

- 1- Conization
- 2- Simple trachelectomy

Difference of Conization (simple cone) and simple trachelectomy (cylinder) is the different tissue removal from cervix (1-5).

The difference of simple and radical trachelectomy is in parametrial tissue resection. In radical trachelectomy, the cervix and surrounding tissues are removed, and the uterus is preserved.

There are several ways to maintain fertility in cervical cancer, by Trachelectomy:

- 1- Radical Vaginal Trachelectomy (VRT).
- 2- Radical Abdominal Trachelectomy (ART).
- 3- Laparoscopic Radical Trachelectomy.
- 4- Robotic Radical Trachelectomy (6-8).

Definitive indication of conization is microinvasive cervical disease (invasion less than 3 mm) where there is no invasion of the lympho-vascular space (LVSI), (stage 1A1).

In Stage 1B1 and Stage 1A2 conization can be used with lymphadenectomy if two conditions exist: a) precise measurement of tumor size, and b) negative margin of the sample in the big cone. In these cases, simple trachelectomy can also be used.

Today, the tendency for more conservative surgery is increasing instead of radical trachelectomy (9,10).

In the case of Stage 1A1 with IVSI, Stage 1A2 and even Stage 1B1 less than 2 cm, data collection is done to make a prognosis whether to use Conization or simple trachelectomy.

Since these patients are fully treatable, if conservative treatment is considered, MRI should be carefully reviewed by an MRI specialist; also, serious pre-surgical consultation is required and in addition, pathological review should be done.

The rationale for more conservative surgery, such as simple trachelectomy or knife conization (CKC), is in cases where parametrial involvement is less likely (less than 1%) including:

- 1- A mass less than 2 cm.
- 2- Negative lymph node in imaging.
- 3- Stromal invasion of less than 50% **(11-15)**.

About 62-67% of low risk early stage patients, if diagnosed with Cone, do not have residual cancer in radical trachelectomy specimen. Therefore, cervical tissue resection with a cone or simple trachelectomy is probably sufficient.

Due to the potential risk of LN metastasis, laparoscopic or sentinel LN mapping is done **(16-17)**.

An extensive study is underway (SHAPE Trial) to compare simple hysterectomy with lymphadenectomy versus radical hysterectomy with lymphadenectomy in low-risk individuals (lesion below 2 cm). If the SHAPE Trial results is in favor of simple hysterectomy, it is also indirectly applicable for the comparison of simple and radical trachelectomy. In lesions less than 2 cm, some centers prefer simple trachelectomy instead of radical trachelectomy. Provided invisible or small lesion with examination and MRI confirmation, CKC with negative margin and simple trachelectomy in larger lesions, is recommended **(18-20)**.

The definitive indication is in the case of stage 1A1 with LVSI and stage 1A2-B1 with fertility-sparing request.

The requirements for patient selection include:

- The desire to maintain fertility-sparing.
- Reproductive age (under 40 and up to 45 years).
- Not high-risk pathologies like neuroendocrine.
- Mass less than 2 cm with limited endocervical invasion (according to MRI).
- No evidence of LN metastasis **(5)**.

LVSI is a risk factor for recurrence, but if found alone, it is not contraindication for surgery. People with LVSI should be informed that the risk of recurrence is higher, especially if the LVSI is extensive.

According to these criteria, 40% of patients undergoing radical hysterectomy are candidates for radical trachelectomy. Even if necessary, criteria are met, fertility-sparing procedure in 10 to 12% of patients are abandoned intraoperatively changing to hysterectomy **(14-17)**.

Criteria for stopping radical trachelectomy surgery, and changing it into hysterectomy are as follow:

- Positive endocervical margin.
- Lesion larger than previously thought (with prior surgery, MRI this is unlikely).
- LN positive in frozen section.

In one study radical hysterectomy and laparoscopic radical trachelectomy were compared and there was no difference in recurrence. Radical trachelectomy can be performed in several ways including vaginal, abdominal, laparoscopic and robotic. Comparing Vaginal Radical Trachelectomy (VRT) and Abdominal Radical Trachelectomy (ART), it should be noted that experience is less necessary in ART and people skilled in radical hysterectomy can do it. So, it's gaining popularity **(17-19)**. Respectability is more in ART and therefore it is mostly recommended in larger tumors. Vaginal approach is sometimes difficult in cases such as young girls; the abdominal procedures are better in them. Injury to the uterine artery is more likely in ART, causing endometrial atrophy, cervical stenosis, and intrauterine growth restriction (IUGR) in the future. However, in new methods, arteries are preserved.

To summarize the ART disadvantages, one should note longitudinal abdominal incision, more bleeding, longer hospital stays and uterine artery injury. While choosing VRT or ART method, the factors that influence are as follow: the experience of the surgeon, available tools and the size of the tumor. Vaginal trachelectomy is being out of use.

In one study, the society of gynecologic oncology (SGO) members and fellows were questioned regarding the method they used. Results showed that vaginal method was used in less than 15%, abdominal method in 47% and robotic method in 40% **(21,22)**.

The indication under discussion is radical trachelectomy in a mass larger than 2 cm. In a mass larger than 2 cm that fulfill other criteria of the trachelectomy conditions, there are two choices; the first is choosing the abdominal method (ART instead of VRT) and the second is neoadjuvant chemotherapy before trachelectomy.

If neoadjuvant chemotherapy is to be performed, some would suggest laparoscopic LN removal first, and if the LN metastasis is negative, main surgery should be performed and fertility-sparing surgery is allowed. That is, laparoscopic triage should be performed before choosing the method of fertility-sparing.

Of course, neoadjuvant chemotherapy has been demonstrated to transform positive lymph nodes to negative in Stage IB2-IIA2. Therefore, laparoscopic triage method can reduce the chance of fertility-sparing **(23)**.

After neoadjuvant chemotherapy, it is unclear which of treatments including radical trachelectomy, simple trachelectomy and conization is the best. Adjuvant radiotherapy may be required in cases where the mass is greater than 2 cm.

MRI should be performed before radical trachelectomy, which is the best preoperative imaging in cervical cancer. Pre-operative MRI should consider the size of the tumor, location of tumor, degree of endocervical canal expansion, endocervical canal length, distance between the superior margin of the lesion and isthma. The distance between margin and isthma is important; if less than one-centimeter, neoadjuvant chemotherapy is first performed followed by surgery.

Indications for neoadjuvant chemotherapy include less than 1 cm distance to upper margin of lesion and mass size more than 2 cm (controversial) (22).

Summary of the intra-operative and post-operative measures of trachelectomy are as follow:

- Frozen section: 8-10 mm normal tissue should exist; otherwise, repeated cervical resection is done.
- Surgeon should pay attention to preserving the uterine artery.
- We have to be careful with the ureter and sometimes ureteral stents are needed.

Cerclage is also done with non-absorbable material (24).

### Subsequent Obstetrics Outcomes in Radical Trachelectomy

Second trimester miscarriage and preterm delivery are more likely. Pregnancy results are good. Caesarean section is recommended for about 37-38 weeks. Cesarean section incision is Kerr or Low vertical. After fertility is complete, hysterectomy is controversial (25, 26).

### Conclusion

Young women's request for cervical cancer fertility-sparing must be considered. Cervical cancer fertility-sparing is done in Stage 1A1 cases without LVSI, Conization. Conservative Surgery in stage 1B1 and 1A2 (Trachelectomy) must be considered if necessary, criteria exist. The necessary criteria is as follows: Fertility-sparing request, being under 40 years age, non-neuroendocrine pathology, less than 2 cm tumor size, no evidence of LN metastasis, no LVSI (not contraindication). Even in masses larger than 2 cm, trachelectomy can be performed abdominally or after neoadjuvant chemotherapy. Performing an MRI in the early-stage cervical cancer before fertility-sparing must not be forgotten.

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### Conflict of Interest

The author declared no conflict of interest.

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