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CASE REPORT

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First case of four spontaneously conceived successful pregnancies after fertility-sparing surgery for cervical cancer

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Abstract

Cervical cancer represents a particular burden when affecting women in their fertile years. Fertility-sparing surgery such as trachelectomy can maintain a woman`s childbearing ability. Favorable outcomes are possible, as depicted in this case.

KEYWORDS

cervical cancer, fertility-sparing surgery, live birth rate, stage IB1, trachelectomy

1 | INTRODUCTION

We present the case of a young woman with early-stage cervical cancer who received fertility-sparing treatment using trachelectomy. This is the first case of 4 subsequent, spontaneously conceived pregnancies after trachelectomy.

For women with early-stage cervical cancer who desire future fertility, fertility-sparing surgery (FSS), such as conization or trachelectomy, is an alternative to radical hysterectomy. Simple trachelectomy (ST) refers to the removal of approximately 2/3 of the cervix, whereas radical trachelectomy (RT) involves the additional removal of the parametria and a vaginal cuff. Surgical approaches include vaginal (VRT, *Dargent`s procedure*), abdominal (ART), and minimally invasive radical trachelectomy (MIS-RT).

The use of trachelectomy has been increasing recently, especially in women <30 years, and the oncological outcome in terms of survival is comparable to hysterectomy.[1]

Even though trachelectomy is an oncologically feasible option, there is an increased risk of adverse obstetrical and perinatal outcomes, with a reduced pregnancy rate, an increased abortion rate, and an elevated risk of preterm delivery.

Few papers discuss the oncologic and obstetric management in this patient population, and spontaneous conception has rarely been reported. We describe the case of a 28-year-old woman with stage IB1 cervical cancer, who had four spontaneously conceived and successful pregnancies after laparoscopic lymphadenectomy followed by VRT. To the best of our knowledge, this is the first report of four live births after VRT for cervical cancer.

2 | CASE REPORT

A 28-year-old Caucasian woman was referred to our hospital in 2016 for treatment of a cervical high-grade intraepithelial lesion (HSIL/CIN III). The asymptomatic patient had a history of low-grade cervical lesions (LSIL) since 2014, which were first discovered as incidental findings in a screening examination, and no pre-existing conditions. Family history was negative for malignancy. After conization, histology revealed a squamous cell carcinoma (SCC) with a depth of invasion of 0.5 mm, a maximum width of 10.0 mm, and free surgical margins, resulting in a TNM stage of pT1B1V0L0G1 (FIGO IB1). Endocervical curettage excluded endocervical involvement. Following the case discussion at the tumor board, radiological and histological staging in combination with FSS was recommended, as the patient wished to conceive in the future.

FDG-PET/CT revealed no evidence of metastatic disease. Four weeks after conization, lymph node involvement was excluded through laparoscopic pelvic lymphadenectomy (pN0/44). Six weeks postoperatively, VRT was performed. This included the removal of 2/3 of the cervix uteri, dissection of the paracervix, removal of a vaginal cuff, removal of the vesicouterine ligaments at the level of the ureter, and transsection of the sacrouterine ligaments 1cm distal to the cervix. The uterine artery was spared. Total resected cervical length was 16mm (remaining cervical length: 8 mm). A cervical cerclage (CC) was performed using Prolene 0. A silicone urinary catheter remained in utero for three days. The postoperative course was uneventful, and the patient was discharged on day four. Histology showed no further evidence of SCC in the resected specimen. Postoperative recommendations included abstaining from sexual intercourse for at least six weeks and to delay a planned pregnancy for at least three months. Oncological follow-up was arranged according to national guidelines for cervical cancer: clinical and sonographic examinations every three months with cytology every six months during the first three years postoperatively, and further clinical, sonographic, and cytological examinations every six months during years four and five.

The patient conceived spontaneously four months after trachelectomy. Prenatal screening (nuchal scan, genetic testing, and morphology scan) and a Pap smear at 21 weeks were unremarkable. At 32 weeks, she was admitted for administration of steroids and tocolysis because of contractions and cervical shortening (16mm to 6mm). At 34 weeks, a cesarean section was performed due to tocolytic failure. Neonatal assessment was unobtrusive (♀, APGAR 8–9–10, UA-pH 7.34, 2140 g).

Seven months later, a second pregnancy was confirmed. Prenatal screening was unremarkable. A cesarean section was performed at 36w5 due to contractions and PPROM. Neonatal parameters were normal (♂, APGAR 9–9–10, UA-pH 7.36, 2850 g). Oncological, clinical, and imaging studies remained normal postpartum (Figure 1A).

A third pregnancy occurred six months thereafter. After a normal nuchal scan and NIPD, the morphology scan revealed a vascular ring, suggestive of a right-sided aortic arch with an arteria lusoria sinistra and a Kommerell`s diverticulum. NIPD was repeated, and the risk for microdeletion syndromes (including DiGeorge syndrome) was considered low. The patient was assessed by the pediatric cardiologists, with the recommendation of delivering in a tertiary neonatal center. At 36 weeks gestation, a healthy baby was delivered by cesarean section after PPROM (♀, APGAR 8–9–10, UA-pH 7.29, 2370g).

In April 2020, the patient became pregnant a fourth time. An early pregnancy Pap smear showed no intraepithelial lesion or malignancy, and clinical examination showed no signs of recurrence. The further course was uneventful, with a normal NIPD and second-trimester scan (Figure 1B). Cesarean section was performed in December 2020 at 35w2 due to contractions (♂, APGAR 8–9–9, UA-pH 7.36, 2360g). An oncological follow-up visit is planned three months postpartum, with a recommendation for hysterectomy after completion of family planning.

3 | DISCUSSION

A live birth with a healthy baby is the ultimate goal when choosing FSS. Simultaneously, oncological safety is of utmost importance. In this context, the oncological and obstetric outcomes must be considered separately.

3.1 | Oncological considerations

For an ideal outcome, patient selection is critical. Ideally, the procedure is performed in women with a cervical cancer ≤FIGO stage IB1, with a histology of SCC or adenocarcinoma, even though case reports of women in higher stages or with rare histological subtypes exist. The risk of recurrence is increased with tumors >2 cm.[2,3] Further contraindications include a history of sterility and age >40–45 years. A laparoscopic nodal staging should be performed primarily, and patients with nodal infiltration need to be managed on an individual basis. In cases of nodal involvement, a neoadjuvant chemo- or radiotherapeutical approach has been described, but this is not considered standard care.[4]

In accurately selected patients, oncological outcomes of VRT are comparable to those of traditional radical hysterectomy. Systematic reviews have found a recurrence rate of 3.7%–4% and a cancer death rate between 1.1 and 1.7% after median follow-up periods of 40 and 54 months, respectively.[2,3]

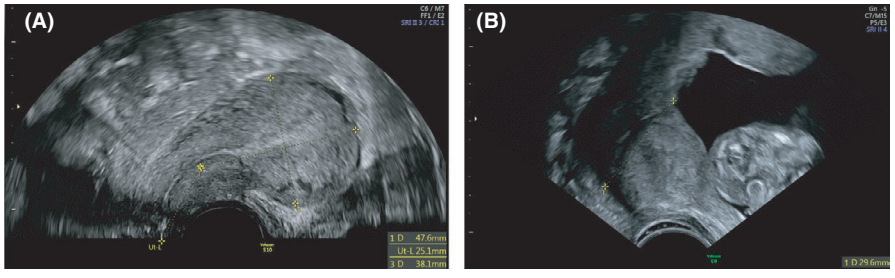

FIGURE 1 Transvaginal sonographic imaging of the "neo-cervix": (A) Transvaginal imaging after two cesarean sections; (B) Second-trimester cervical length measurement during the fourth pregnancy

A close postoperative oncological surveillance is mandatory. In the first three years postoperatively, we recommend clinical and sonographic follow-up visits every three months, accompanied by cytology every six months. This is followed by clinical, sonographic, and cytological follow-up every 6 months during years four and five, in line with current national guidelines.[5] Thereafter, we recommend continuing with yearly follow-ups, as late recurrences have been reported.[3] In our case, a pelvic examination, sonography, and Pap smear were performed during every follow-up visit. To date, the cytological results have reported an absence of intraepithelial lesion or malignancy.

After childbearing, a hysterectomy is recommended for completion.[5]

3.2 | Obstetrical considerations

Regarding obstetrical outcomes after trachelectomy, the main issues include difficulty to conceive, increased risks of pregnancy loss and preterm birth.

Conception rates after radical trachelectomy vary greatly between studies. In a recent meta-analysis that investigated FSS (all types) for early-stage cervical cancer, 3044 patients including 1047 pregnancies were identified.[2] The pregnancy rate of women trying to conceive was 55%. The highest pregnancy rate was found in patients undergoing VRT (67.5%). 20% of the pregnancies required assisted reproductive technology, but this rate has been reported to be as high as 55%.[6] The encouraging fertility observed in our patient is multicausal and can only be explained to some extent. The below-average age of 28 years at diagnosis should be noted. Regarding surgical technique, the sparing of the uterine artery and the postoperative indwelling of a foley catheter in utero to avoid stenosis could be beneficial factors in avoiding subfertility.

Pregnancy loss is increased after FSS for cervical cancer. A meta-analysis containing 805 pregnancies after RT reported an abortion rate of 24.0% (18.8–29.6%).[7] Regarding VRT, Nezhat et al. found a live birth rate of 63.4% among women who became pregnant.[2]

After FSS, the risk for preterm birth is increased. In a systematic review, 27/200 pregnant women delivered between 24 and 34 weeks, equivalent with a 13.5% rate of early or moderate preterm births,[8] and up to 34.6% of the pregnancies were reported to be delivered between 24 and 36 weeks.[2]

A number of surgical techniques have been advocated for preterm birth prevention. Total cervicovaginal occlusion has been mentioned in some publications, but is not routinely recommended, as the extent of cervical removal and the patient's obstetrical history need to be taken into account when assessing the risk for preterm birth.[8]

Cervical cerclage is a more common approach and routinely done by many surgeons; the majority of successful pregnancies were found in patients with CC in situ.[8] In our patient, we observed a favorable outcome with a maintained cerclage; nevertheless, the issue remains controversial, and some authors have abandoned CC placement due to lack of supporting data.[3]

The use of second-trimester sonography to assess cervical length has been recommended as a predictor of preterm birth.[2] When implementing this technique after trachelectomy, it is important to remember that standard values for cervical length screening neither apply nor exist, but a new-onset dynamic shortening should prompt caution. As expected, our patient had difficulties in carrying pregnancies to term, but given the high pre-existing risks, the gestational ages achieved (34–36 weeks) represent an exceptional outcome.

4 | CONCLUSIONS

We describe the first case of four spontaneously conceived and successful pregnancies after VRT.

Fertility-sparing surgery is a safe and feasible option for women with early-stage cervical cancer wishing to maintain their childbearing ability. However, the obstetrical outcome can be compromised, with a decreased pregnancy rate as well as an increased risk for abortion and preterm birth.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

J.M. and P.I.: Conceptualization. J.M.: Writing—original draft preparation and project administration. P.I. and G.S.: Supervision. All authors: Writing—review and editing. All authors have read and agreed to the published version of the manuscript.

ETHICAL APPROVAL

Institutional Review Board Statement: According to Swiss law, this is no research project under the Swiss Human Research Act (Humanforschungsgesetz, HFG) and therefore, no authorization is required. Written informed consent was obtained from the patient for publication of the case report and accompanying images.

INFORMED CONSENT

A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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