

Laparoscopic abdominal cerclage after radical vaginal trachelectomy

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Summary

Background: The incidence of cervical cancer (CC) in Slovenia in 2011 was 13.2 per 100,000 women. The treatment of early stages of invasive cervical carcinoma involves several surgical techniques. In this article the authors would like to present a new combination of two methods which help to preserve fertility and to improve pregnancy outcome. The first procedure, radical vaginal trachelectomy (RVT), begins with laparoscopic pelvic lymphadenectomy. All suspicious lymph nodes are sent to frozen section. If those lymph nodes are negative, the procedure continues vaginally. Almost the entire cervix is removed with parametria and vaginal cuff. Permanent cerclage stitch is applied and covered with vagina on what is left of uterus. Second procedure, laparoscopic abdominal cerclage (LAC), begins with pneumoperitoneum. Mersilene tape is introduced in the abdominal cavity and placed through the visceral peritoneum at the isthmic part of the uterus with a Berci's needle. It is knotted and remains permanently. **Materials and Methods:** For the first procedure all the patients with confirmed cervical carcinoma (FIGO Stage IA₁, IA₂, and IB₁) and with the desire for fertility were recruited. For the second procedure, all the patients after RVT and after miscarriage after 14th week of gestation were recruited. **Results:** RVT was performed in 15 patients and laparoscopic abdominal cerclage in three of them (21.5%). All three patients achieved pregnancies and after 36th weeks of gestation delivered by cesarean section (100%). **Conclusions:** RVT alone is an indication for LAC. Considering its success, LAC should be performed before any miscarriage.

Key words: Cervical cancer; Fertility preservation; Radical vaginal trachelectomy; Laparoscopic abdominal cerclage.

Introduction

Cervical cancer (CC) is still one of the common cancers in women in Slovenia; in 2011, the incidence was 13.2 cases per 100,000 women. The majority of cases (60-70%) are in the early, localized stage of the disease [1]. In addition to infection with human papillomavirus (HPV), the formation and development of CC requires several years or even decades of infection [2].

The age of Slovenian women who give birth for the first time is 30 years, thus increasing the number of those women who suffer from CC before becoming mothers for the first time.

Last classification of the International Federation of Gynaecology and Obstetrics (FIGO) in 2009 takes into account the clinically diagnosed anatomical distribution of the disease and divides CC into five stages [3]. Until recently, the treatment of early CC FIGO Stage I and II meant a radical hysterectomy with removal of the pelvic lymph nodes and the parametrium. Today, the criterion for successful treatment of oncological patients is not only survival, but also the quality of life after treatment. Greater attention is paid to maintaining the functions of pelvic organs (bladder, bowel, sexual function) and in younger patients, the preservation of fertility.

Approximately 20-30% of early forms of CC are diagnosed in women of reproductive age, therefore it is important that cases with small chances of metastases are found and which can be successfully treated with surgery to preserve fertility [1, 4].

Deferred laparoscopic abdominal cerclage (LAC) after radical vaginal trachelectomy (RVT)

At the Division of Obstetrics and Gynaecology in Ljubljana the authors began performing RVT in 2009, which in the initial CC stages (FIGO Stages IA and IB₁), enables to preserve the body of the uterus. It was first described in 1994 [5]. With this surgery the entire cervix with parametria and the vaginal cuff are removed. The surgery is always combined with the removal of the pelvic lymph nodes. After such surgery, pregnancy itself is not a problem: it is carrying the child to term that is difficult. There is a higher incidence of abortions in the second trimester and more preterm births. Worldwide preference for the prevention of a loss of a pregnancy includes suturing the cervix after 12th week of pregnancy. At the Division of Obstetrics and Gynaecology in Ljubljana the authors decided to prevent the loss of a pregnancy with LAC, that is, in their opinion, a more effective and permanent method since it only has to



Figure 1. — Cutting of the cervix and its parametrias.



Figure 2. — Cervix and its parametrias after dissection.

be performed once. This resulted in a new combined method of treatment of the initial invasive CC, which is delayed LAC after a RVT.

Materials and Methods

Primary surgery - RVT

The surgery usually begins with a laparoscopic pelvic lymphadenectomy, where lymph nodes are removed on both sides from the artery and common iliac vein to the circumflex vein on the external iliac artery, in the obturator fossa and between the outer and inner iliac arteries. All suspicious nodes are sent to frozen section. The procedure continues vaginally only if all the nodes sent to frozen section are without metastases (Figure 1). Most of or the entire cervix, parametria, and the vaginal cuff are vaginally removed. On the lower segment of the uterus they a permanent cerclage stitch is applied and covered with vagina, similarly to Fothergill's surgery, so that at the end of the surgery the vaginal fornices are levelled with a visible opening to enable menstrual blood flow (Figure 2). The procedure concludes with a vaginal tamponade applied for 24 hours and a bladder catheterisation for 72 hours.

Secondary surgery - LAC

Patients are classically prepared for a laparoscopic procedure, including bladder catheterization and insertion of a uterine manipulator. Under a general endotracheal anaesthesia, a pneumoperitoneum is performed, optics through the umbilicus and three trocars are introduced in the classic areas for the laparoscopic procedure of the lower abdomen [6]. The vesico-uterine plica is opened in the isthmus area with an RVF positioned uterus in the length of approximately two cm. Mersilene tape is inserted through the ten-mm trocar in the abdomen (Figure 3). A Berci's needle is introduced through a skin incision just above the symphysis, at one cm from the right median line. With the needle, the tissue and the peritoneum on the uterine lateral wall are punctured above the rectum through an incision in the peritoneum in the vesico-uterine plica. With the uterus in the AVF position, one end of the Mersilene tape is grasped with Berci's needle and pulled to the front of the uterus. The procedure is repeated on the left side, and in the end both sides of the tape are tied with four knots, the ends are cut,

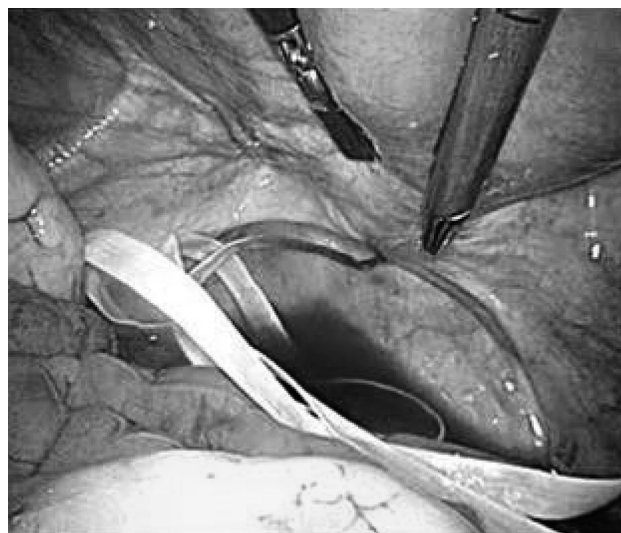


Figure 3. — Mersilene tape in Douglas pouch during laparoscopic abdominal cerclage.

and the surgery is completed.

Inclusion criteria included from an oncological point of view, the possibility of performing RVT; at the same time, there must be histologically confirmed CC, the tumour must be less than two cm in size (evaluation Stage FIGO IA₁, IA₂, and IB₁) and above all, the patient must have the desire to preserve her fertility. The authors additionally operated those patient that had had RVT performed and had at least one abortion after 14th week of pregnancy.

Exclusion criteria included women that did not wish to have another operation and did not wish to become pregnant after RVT from the second surgery.

Results

By performing the primary surgery, RVT, the present authors have so far treated 15 patients at the Ljubljana's Division of Obstetrics and Gynaecology: five in Stage IA₁, eight in Stage IA₂, and two in Stage IB₁. None have had a disease relapse so far. Eleven patients (71.3%) have not yet decided for pregnancy after the treatment of CC. Two patients (14.3%), which spontaneously become pregnant after the surgery, had a miscarriage at 18th and 19th week of pregnancy. The third patient (7.2%) had a problem with infertility before the primary surgery and became pregnant through the process of IVF-ET. The fourth patient's pregnancy was unplanned and was terminated in 7th week of pregnancy. All three patients (21.5%) who wished to become pregnant after the treatment then underwent secondary surgery - LAC. After the secondary operation, all three successful carried their babies to term (100%) and delivered healthy babies by cesarean section at 38 weeks and 36 weeks of pregnancy.

Discussion

Abdominal radical trachelectomy was developed and described in 1952 by Professor Franc Novak from the University Medical Centre Ljubljana's Division of Obstetrics and Gynaecology [7]. Professor Dargent from France trained under professor Novak, developed the vaginal approach to radical trachelectomy, which he published in 1994 [5]. Results of a 16-year long analysis of the results of treatment of patients after RVT show that the number of relapse and mortality in these patients is fully comparable with the results in patients who underwent classical surgery, i.e. a radical hysterectomy after Wertheim-Meigs-Novak (4.2 % vs. 2.8%). As much as 63% of all patients that wished to become pregnant after surgery did in fact achieve it. From the results published by Plante *et al.* in 2011, it is evident that among the patients there were 20% of those that miscarried in the first trimester and 3% in the second trimester [8]. Seventy-three percent carried to the third trimester and 75% of them to full-term [9-11].

The analysis of the results of pregnancy in patients after treatment of CC with RVT showed that abortion rate in the first trimester of pregnancy is comparable to the abortion rate in the healthy population; however, there were more miscarriages in the second trimester and more premature births in comparison with healthy women [12-14].

Abdominal cerclage is not a new procedure; it has already been described in detail by Benson and Durfee in 1965 as a successful alternative to vaginal cerclage [15]. Eighty-five to 90% of their patients that underwent abdominal cerclage carried the fetus to viability.

The less common approach of the abdominal cerclage triggered many reactions in the professional community, along with many objections to the relatively invasive tech-

nique. In 1991 Novy proposed indications for an abdominal cerclage that are mostly still used today; however, trachelectomy is not one of them, since it had not been performed at that time [16].

Laparoscopic method of an abdominal cerclage was first described by Scibetta *at al.* in 1998, thus transforming the method into a minimally invasive one [17]. It was well accepted by the professional public. In 2002 Von Teobald published the results of five successful pregnancies in five patients who underwent LAC [18]. A year later, in 2003, Mingione *et al.* published results of 11 patients, ten of which became pregnant, with two pregnancies ending with a c-sections in 35th week of pregnancy and others after 38th week [19]. Some of the patients from the studies had undergone conization before LAC, none, however, underwent a trachelectomy.

A review article from 2007 [20] reported that stitching the vagina after 12th week of pregnancy had no influence on the abortion rate in the second trimester or preterm birth [20].

Eleven out of the present 15 patients that underwent RVT for CC decided against motherhood. The reasons varied from being left without a partner, being worried about the economic crisis, and even not being mentally prepared for motherhood after recovering from a cancerous disease. Three patients that underwent RVT for CC opted for motherhood; one of them had problems with infertility before RVT and became pregnant after IVF-ET.

Vaginal cerclage on its own did not work and required LAC. The three patients had a positive experience with pregnancy and giving birth and did not exclude the possibility of having more children, since it was the first pregnancy for all three.

Given the small number of pregnancies in the present patients after RVT, the authors have not yet decided for the deferred LAC to be a matter of routine procedure after each RVT. Undoubtedly, this is the method of choice in patients where the vaginal cerclage performed during RVT will prove to be inadequate.

We must ask ourselves whether the present standpoint is even ethical, since there were no successful pregnancies after RVT combined with a vaginal cerclage. The present authors could say that the pregnancies achieved after LAC were mere coincidences, since their success is scientifically difficult to prove due to the small number of cases, or even propose LAC to be the method of choice.

According to the aforementioned facts, the present authors raise a question whether it is ethical for women after RVT to wait to become pregnant or to have a miscarriage before performing LAC? We must be aware that the population of these patients is even more sensitive when it comes to pregnancy, and a miscarriage after having surgery is even harder to accept in comparison with women who never suffered from gynaecological cancer. The present authors believe that the successful term pregnancies resulting

from LAC give sufficiently serious starting points for the implementation of the method as preventive.

The present patient who became pregnant with the process of IVF-ET and gave birth in 36th week by a c-section due to contractions, had difficulties with conception and carrying a baby to term (she previously had two miscarriages) even before RVT. The cause for infertility was male factor. The authors believe that her preterm labour (two weeks earlier than the other two patients) was probably caused by other factors in the context of her impaired fertility rather than by the LAC procedure.

Conclusions

At The present clinic the authors have upgraded the RVT method with the LAC procedure in order to avoid miscarriages in the second trimester of pregnancy, which proved to be a successful combination. All three of the present patients, which had LAC performed after RVT, gave birth in 36th or 38th week of pregnancy. All the children are healthy. The authors believe that the status after the treatment of patients with CC with RVT is an indication for LAC.

In anticipation of new pregnancies in the authors' patients, they hope to demonstrate that LAC after RVT is a method of choice for all those patients who will have a miscarriage in the second trimester of pregnancy in spite of a vaginal cerclage; moreover, they could even perform LAC before any miscarriages occur.

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