

Case Report

## Successful Delivery after Abdominal Radical Trachelectomy, Using Transabdominal Cerclage in Early Pregnancy

Shoko Tamada, Hisashi Masuyama\*, Kei Hayata, Eriko Eto,  
Takashi Mitsui, Takeshi Eguchi, Jota Maki, and Kazumasa Tani

*Departments of Obstetrics and Gynecology, Okayama University Graduate School of Medicine,  
Dentistry and Pharmaceutical Science, Okayama 700-8558, Japan*

Radical trachelectomy (RT) is a fertility-sparing surgery for cervical cancer. Postoperative pregnancies have a high risk of abortion and prematurity. To prevent this, a procedure involving transabdominal cerclage (TAC) was devised for shortened cervical canals post-RT. Here we describe the successful management of a pregnancy after abdominal RT (ART). The 34-year-old patient was gravida 1, para 0. When she was 27, she underwent ART for stage Ib1 cervical cancer, and she became pregnant 7 years later. Because her cervical canal was 16.7 mm during early pregnancy, we performed TAC at 12 weeks of pregnancy. Post-surgery, we administered an infusion of ritodrine hydrochloride for tocolysis. A selective caesarean section was performed at 36 weeks, with the delivery of a healthy infant.

**Key words:** cervical cancer, radical trachelectomy, pregnancy, transabdominal cerclage

In recent years, with the increase in the incidence of invasive cervical cancer among juveniles, radical trachelectomy (RT) has become increasingly common as a fertility-sparing surgery. At the same time, there is an increasing number of reports on pregnancy after surgery. One of the problems of perinatal management is the high occurrence rates of abortion and premature birth [1, 2]. This may be attributed to the decrease in load-bearing capacity due to a shortened cervical canal after surgery, along with an ascending infection by intravaginal bacteria [3]. Various methods have been devised as prophylaxis, including cervical cerclage of the remnant uterus at the RT, or transabdominal cerclage (TAC) before pregnancy or during early pregnancy. In the case described herein, our patient became pregnant naturally 7 years after having undergone an abdominal radical trachelectomy (ART), and

she underwent TAC at the 12th week of pregnancy and achieved a live birth at the 36th week of pregnancy by a scheduled caesarean section. Pregnancy after ART is very high risk. We provide the details of the perinatal management of this patient's case.

### Case Report

The patient was a 34-year-old Japanese woman, gravida 1, para 0. She had had an artificial abortion at the age of 19. At the age of 27, she was diagnosed with cervical cancer stage Ib1 (FIGO classification) and underwent ART at our hospital, with a removed cervix length of 25 mm. At that time, the uterine artery ascending branch on the left side could not be preserved, but the right side was preserved. In addition, the patient did not undergo cerclage of the remnant cervical canal.

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\*Corresponding author. Phone: +81-86-235-7320; Fax: +81-86-225-9570  
E-mail: masuyama@cc.okayama-u.ac.jp (H. Masuyama)

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After the ART surgery, the patient was followed up by a checkup every few months, and most recently had undergone such checkups every 6 months. She married at the age of 33 and thereafter became naturally pregnant at the age of 34 without any infertility treatments. She consulted our hospital, and at the initial consultation, she was diagnosed at the 8th week of pregnancy based on the ultrasonographic findings. At this time, because the length of the cervical canal had significantly shortened to 16.7 mm (Fig. 1) without undergoing cervical cerclage, we decided to perform cerclage during the stage of early pregnancy.

The sutured part of the vaginal wall and neo-cervix was found to be difficult to peel off transvaginally. As a result, we decided to perform this procedure transabdominally. We carried out the TAC under spinal anesthesia on the fifth day of the 12th week of the patient's pregnancy. Although the adhesion of the intestinal canal to the abdominal wall and uterine was mild, the adhesion of the bladder and rectum with the lower uterine body was strong. It was therefore difficult to peel off those adhesions. In order to perform adhesion peeling at the position of the internal uterine os, we made transabdominal and transvaginal observations by ultrasound during surgery. After peeling off those adhesions up to the internal uterine os and confirming the absence of blood vessels by transvaginal ultrasound, we carried out cerclage using a Teflon suture at the same site.

Suturing was performed on the rectum side to avoid any bladder penetration of the ligature. The operation duration was 1 h 45 min, with a bleeding amount of approx. 150 ml. The heartbeat of the fetus was good even after the surgery. After the surgery, we conducted

vaginal douching and administered ulinastatin vaginal suppositories twice a week to prevent infection, administering a continuous intravenous infusion of isoxsuprine hydrochloride until the 16th week of pregnancy and ritodrine hydrochloride thereafter for tocolysis. The ritodrine hydrochloride was administered from 50  $\mu$ , and it was not thereafter increased. A vaginal culture was carried out every 2 weeks, and no infection signs were observed.

The internal uterine os was maintained by a cerclage suture, without shortening the length of the cervical canal (Fig. 2). From the 28th week of pregnancy, we observed a significant development of varices around the cerclage sutures and bladder as well as at the suture site of the uterus and vaginal wall (Fig. 3), with no bleeding detected during the pregnancy. There were no varices in the neo-cervix. Based on concern about bleeding from the varices during the caesarean section, we prepared 600 ml of preserved autologous blood prior to the delivery. To remove the cerclage sutures, we evaluated the blood stream during the caesarean section using transvaginal ultrasound. We planned to carry out the removal of the cerclage sutures, if the varices had regressed after the delivery, and if we found that the removal was not possible, then we would perform an abdominal closure while waiting for the involution of the uterus and scheduling two-stage surgery.

The patient continued to be hospitalized even after the TAC, and we carried out a selective caesarean section on the fifth day of the 36th week of her pregnancy. She successfully gave birth to a 2,718-g female (+0.72SD) with the Apgar scores 8/9 (1-min data/5-min data), umbilical artery pH (UmApH) 7.206, and umbilical vein pH (UmVpH) 7.244. Upon our observation of the



Fig. 1 Ultrasonography at the 10th week of pregnancy. The length of the cervical canal is significantly shortened to 16.7 mm.

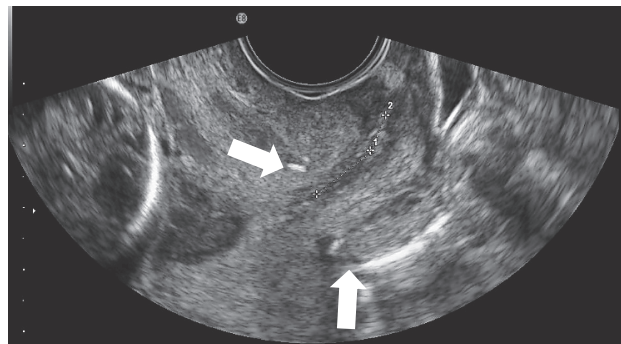
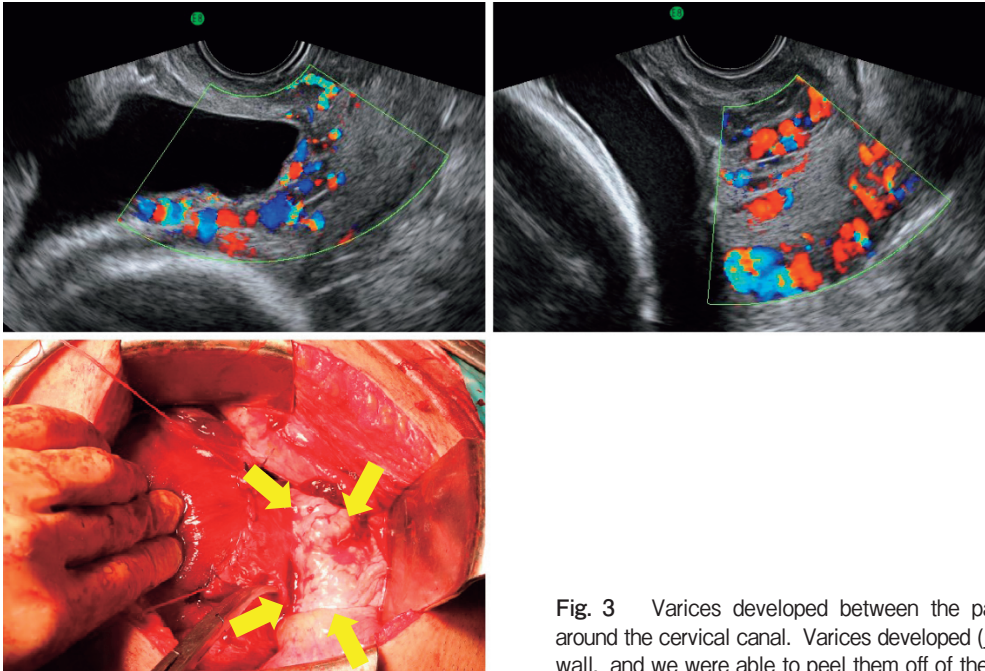


Fig. 2 Cerclage sutures can be observed at a location 17.2 mm apart from the external uterine os (white arrows).



**Fig. 3** Varices developed between the patient's bladder and uterus and around the cervical canal. Varices developed (*yellow arrows*) along the bladder wall, and we were able to peel them off of the uterine wall during surgery.

patient's varices by transvaginal ultrasound during the cesarean section, because the blood stream was reduced minutes after the delivery, we carefully peeled off the adhesion with the circumference tissues and removed the sutures. The operation duration was 1 h 41 min, with a bleeding amount of approx. 830 ml and an autologous blood transfusion of 600 ml. With a good postoperative course, the patient was discharged with her baby on the 7th postoperative day.

### Discussion

The pregnancy rate after RT has improved while the rate of live birth after RT has become approx. 67% [4]. However, the rates of abortion and premature birth within 32 weeks of pregnancy after ART are high at 38% [5], making the improvement of perinatal prognosis an important issue. TAC was devised for shortened cervical canals after RT, and it has demonstrated good outcomes. TAC is indicated for (1) cases involving the removal of (most) cervical canals by conization, (2) cases undergoing conization two or more times, and (3) after RT, for which it is difficult to carry out transvaginal cerclage. For patients undergoing conization who do not have a history of laparotomy, it is relatively easy to carry out cerclage on the avascular area around the

uterine artery. However, because many cases involve adhesion after RT and it is difficult to identify the avascular area, it is important to perform cerclage while confirming the positions of the vessels and internal uterine os by using transvaginal ultrasound during the surgery.

With respect to the timing of TAC, we have compared the reports of uses of TAC before pregnancy and reports of uses of TAC during early pregnancy. We found that the proportion of patients who were able to maintain their pregnancies until the 34th week or longer was 90% when the TAC was performed before the pregnancy and 74% when the TAC was performed during the pregnancy; the before-pregnancy success rate was significantly higher [6]. In the present case, because the patient came to our hospital after becoming pregnant naturally, we conducted TAC in the early pregnancy period. However, if the consultation had been before the patient's pregnancy, we could have used options such as strongly pulling the uterus during TAC, which would have made surgery easier.

Around the 28th week of our patient's pregnancy, we observed the development of varices around the cerclage sutures and between the bladder and uterus. Although there was no trouble such as bleeding during the pregnancy, bleeding is a common complication

associated with pregnancy after RT [7], requiring caution in terms of bleeding from the varices.

Pregnancy after RT is very high risk and may require TAC. It is therefore necessary to hold sufficient patient-care discussions and provide an explanation of the risks and a plan before the pregnancy of a patient who has undergone an RT.

### Conclusion

Our patient became pregnant after RT, undergoing TAC at the 12th week of pregnancy, and she delivered her child at the 36th week of pregnancy. She had first consulted our hospital when she was already pregnant, but it has been reported that TAC carried out before pregnancy has shown better outcomes. If a patient wishes to become pregnant after undergoing an RT, it is necessary to make an adequate plan before the pregnancy.

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