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CASE REPORT

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Successful delivery after vaginal radical trachelectomy for invasive uterine cervical cancer

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Abstract A 32-year-old Japanese woman was diagnosed as having stage Ib1 adenocarcinoma by diagnostic laser conization at a local hospital. She was admitted to our hospital for fertility-sparing treatment. A radical trachelectomy (RT) was performed using the laparoscopic vaginal procedure. The procedure was started with a laparoscopic pelvic lymphadenectomy. As the lymph nodes were tumor free, RT was carried out transvaginally. The excised uterine cervix and lymph nodes were pathologically negative for cancer. Eight months after the operation, the patient became pregnant without any artificial reproduction techniques. At 17 weeks of gestation, she was admitted to our hospital again for a threatened abortion. Continuous tocolytic treatment with ritodrine and daily administration of a granulocyte elastase inhibitor vaginal suppository were given. At 32 weeks of gestation, she underwent emergency cesarean section because of sudden premature rupture of the membranes. A girl weighing 1991 g was delivered, with Apgar scores of 7 and 8 at 1 and 5 min, respectively. Both the mother and the baby were discharged without trouble. This is the first successful case in Japan of delivery after vaginal RT for invasive uterine cervical cancer.

Key words Radical trachelectomy · Uterine cervical cancer · Fertility · Cesarean section

Introduction

Uterine cervical cancer is one of the most common malignant diseases among women. Recently, the number of young patients with this disease seems to be increasing.[1] Most of them desire to retain their fertility. For patients with noninvasive uterine cervical cancer, a conservative strategy such as laser conization has now become the standard treatment modality. On the other hand, a treatment modality for young patients with early-stage invasive uterine cervical cancer who desire to preserve their fertility has not yet been established. It has recently been suggested that radical trachelectomy (RT) could be one of the best procedures for those patients. To date, approximately 350 cases of RT have been reported.[2–4] Although long-term results of these patients are not available yet, most of them show good survival rates, and some patients have become pregnant successfully.

RT was regarded previously as an experimental method in Japan. However, advances in laparoscopic operations, including laparoscopic lymphadenectomy, and a growing demand for preservation of fertility in young early-stage cervical cancer patients, have prompted the introduction of RT in Japan also. Our department started RT in 2003, and we have already treated five cases using RT for patients with early invasive uterine cervical cancer. Although a vaginal approach and abdominal approach have been reported for RT, our operative procedure was based on that of Dargent et al., i.e., vaginal RT with laparoscopic pelvic lymphadenectomy.[2] This therapeutic strategy has just begun being used in some institutes in Japan. As far as we know, no successful delivery after vaginal RT has been reported so far in Japan.

Here we report the first case of successful pregnancy and delivery in Japan after vaginal RT with laparoscopic lymphadenectomy in a young patient with stage Ib1 uterine cervical cancer.

Case report

The patient was a 32-year-old married Japanese woman, gravida 0, para 0. Menarche occurred at age 14, and she had had regular cycles since then. She visited a local hospital for an abnormal Pap smear at mass screening. Adenocarcinoma of the uterine cervix was suspected, and she received

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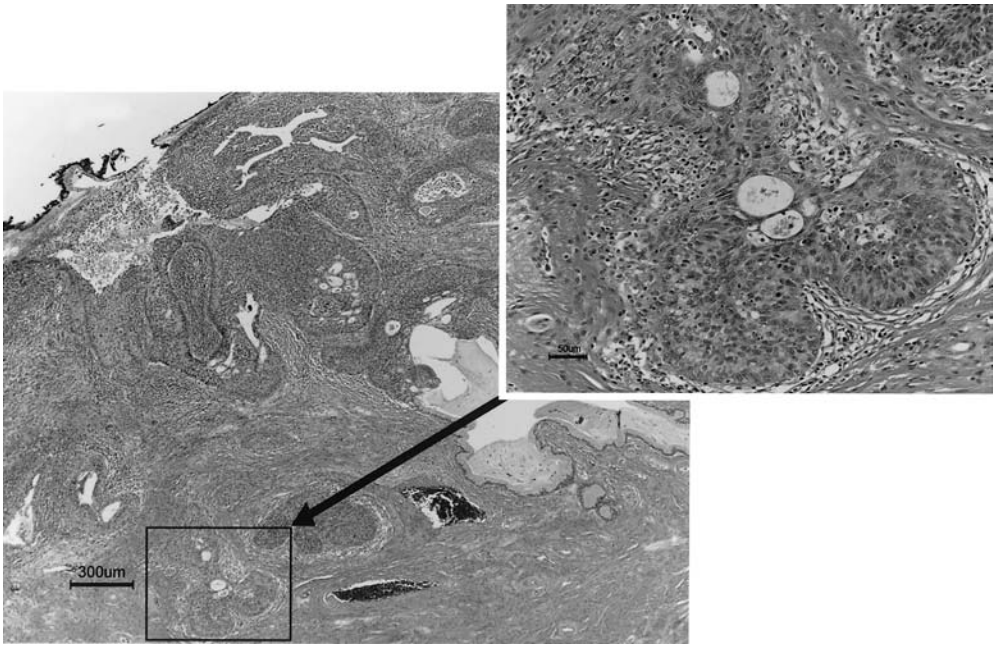

Fig. 1. Laser conization specimen of the uterine cervix showed adenocarcinoma infiltrating to the stroma of uterine cervix. *Arrow* indicates area enlarged at *right*. Hematoxylin and eosin, ×10

diagnostic laser conization at the hospital. Moderately differentiated adenocarcinoma was found on the conization specimen (Fig. 1). The maximum depth of stromal infiltration was 3 mm, and the width of the tumor was 8 mm with no lymphovascular invasion. The margin between the upper part of the tumor and the upper surgical section measured 5 mm. Magnetic resonance imaging (MRI) and a computed tomography (CT) scan demonstrated that there was no suspicious lesion in either the parametrium or lymph nodes. This was a stage Ib1 tumor according to the 1997 Japanese Society Obstetrics and Gynecology (JSOG) classification. The patient desired preservation of her fertility, so she was referred to our hospital for fertility-sparing management.

We gave her and her family detailed information on fertility-sparing management on several occasions, and obtained an informed consent from them. After admission to our hospital, a radical trachelectomy (RT) was performed using the laparoscopic vaginal procedure described by Dargent et al.[2] The procedure was started with a laparoscopic pelvic lymphadenectomy. Four lymph nodes were assessed after frozen section analysis. As the lymph nodes were tumor free, the RT was carried out transvaginally.

Briefly, a rim of vaginal mucosa was delineated circumferentially and excised so that the anterior and posterior mucosa could cover the cervix. The vesicovaginal space was defined anteriorly, then the vesicovaginal space was defined laterally on each side. After identification of the ureters, the bladder pillars were separated and sectioned. Then, the proximal parametrium was excised. The cervicovaginal branches of the uterine artery were selectively excised. After these procedures, the cervix was amputated approximately 10 mm below the isthmus.

To prevent premature opening of the cervix in the event of pregnancy, a nylon suture was placed around the cervix at the level of the isthmus. Sturmdorf sutures were placed to cover the surface of the uterine cervix.

After paraffin embedment, 22 lymph nodes were found, all of which were tumor free. Adenocarcinoma cells were not found on the trachelectomy specimen. Therefore, postoperative adjuvant chemotherapy or radiotherapy was not performed. The patient was carefully followed up every month with a clinical examination, Pap smears, and routine MRI or CT studies (every 4 months). She did not receive any artificial reproduction treatments during the follow-up period.

Eight months after the operation, a gestational sac was detected in her uterus, and it was diagnosed as 4 weeks gestation. Thereafter, she was carefully followed up every 2 weeks. At 17 weeks of gestation, she complained of lower abdominal pain. Transvaginal ultrasound examination revealed that the length of the cervical canal was decreased, and she was admitted to our hospital with the diagnosis of threatened abortion. Under bedrest, tocolytic treatment with continuous infusion of ritodrine and daily administration of a granulocyte elastase inhibitor (urinastatin) vaginal suppository to prevent premature delivery were performed. Fetal growth was good; however, markers for genital tract inflammation, such as slight elevation of the granulocyte elastase level and/or the elevation of the oncofetal fibronectin level in vaginal secretion, were sometimes seen at the routine weekly examination. After admission to the hospital, cervical length as measured by transvaginal ultrasonography recovered once, but gradual reduction of uterine cervical length was detected later (Table 1).

At 32 weeks of gestation, emergent cesarean section was performed because of sudden premature rupture of the membranes. Intraabdominal findings revealed slight adhesion of the peritoneum over the broad ligaments, which was opened at the time of laparoscopic lymphadenectomy, but the mobility of the uterus itself was good and no elevation

Table 1. Fetal growth and changes in uterine cervical length of the patient after admission to the hospital

Gestational weeks	17	19	22	24	28	30	32
Cervical length (cm)	7.5	20	20	20	28	23	20
BPD (cm)			5.0	5.6	7.8	8.0	
EFBW (g)				650	1500	1700	1800
Infectious signs			GBS(+)				PROM
Elastase		+	+	+	+	+	+
PTD		–	–	–	+	+	+
Ritodrine (μg/min)	p.o.	p.o.	100	130	190	190	200

BPD, biparietal diameter; EFBW, estimated fetal body weight; GBS, group B streptococci; PROM, premature rupture of membranes; PTD, oncofetal fibronectin; p.o., per os administration of ritodrine

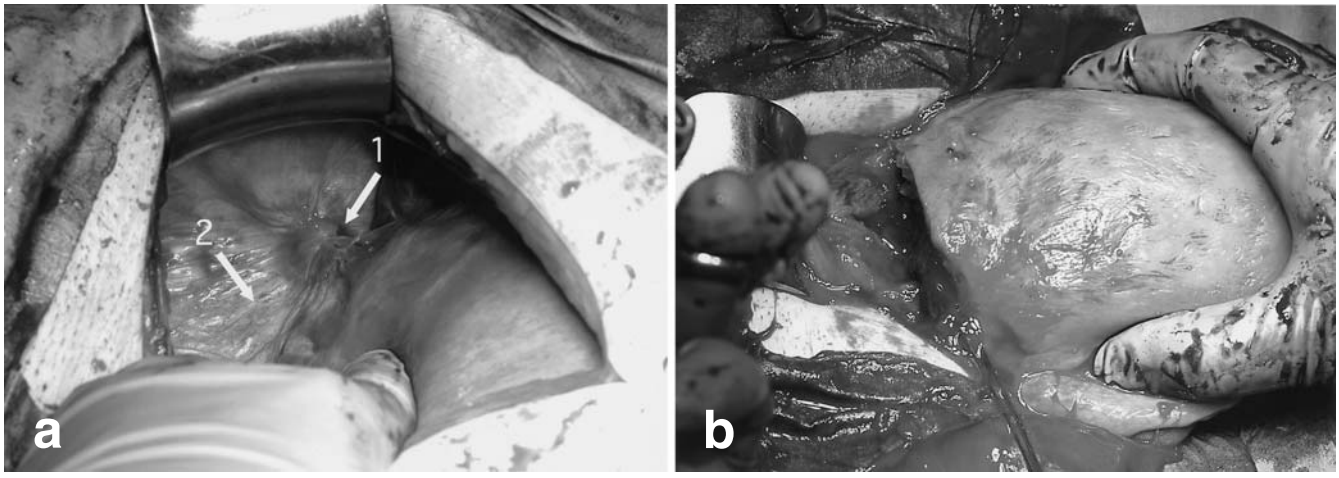

Fig. 2. Uterus of the patient at time of cesarean section. **a** Before transverse incision to the uterus. Slight adhesion of the peritoneum over the broad ligaments (*arrow 1*), which was opened at the time of laparoscopic lymphadenectomy, was seen. No elevation of the vesicouterine septum was seen (*arrow 2*). **b** Uterine wound after delivery of the baby

of the vesicouterine septum was detected (Figs. 1, 2). The nylon suture around the cervix was not removed at the end of the operation, but we confirmed the passage of a no. 7–8 Hegar dilator in the cervical canal. A girl weighing 1991 g was delivered without difficulty, having Apgar scores of 7 and 8 at 1 and 5 min, respectively. pH of the umbilical arterial blood was 7.332. Blood loss during the operation was 800 ml. The postoperative condition of the patient was good, and she was discharged from our department 10 days after the operation. This patient is free of disease 17 months after the first surgery, and she now has regular cycles of menstruation.

Discussion

Minimizing invasiveness, lessening postoperative disability, and preserving function have now become important factors for the surgical treatment of gynecologic cancers. Considering these concepts, RT has become a feasible treatment modality for early-stage invasive uterine cervical cancer in women who would like to preserve their fertility. To date, approximately 350 cases of RT have been reported. Although an abdominal approach and vaginal approach have been reported for RT, our procedure, the combination of laparoscopic lymphadenectomy and vaginal RT, would be less invasive for such patients.

Indication of RT is still controversial. However, we believe the preoperative criteria for RT proposed by Plante et al. in 1998 are still useful.[5,6] They summarized the criteria as follows: desire to preserve fertility, lesion size less or equal to 2 cm, FIGO stage IA1 with VSI, IA2, or IB1, squamous histology or adenocarcinoma, no involvement of the upper endocervical canal as determined by colposcopy or MRI, and no evidence of lymph node metastasis. The condition of this patient, who had stage Ib1 with small-volume adenocarcinoma, with a nonsuspicious metastatic region, was consistent with their criteria.

However, we should pay special attention to the histology of adenocarcinoma of this patient. The rate of adenocarcinomas in young women appears to be increasing in Western countries as well as in Japan. It was reported that almost 40% of patients who underwent RT had an adenocarcinoma.[5] Therefore, patients with early invasive adenocarcinomas will be important targets for RT. However,

early detection and accurate preoperative staging of adenocarcinomas are generally difficult, and adenocarcinomas have different biological characteristics from squamous cell carcinomas. For example, adenocarcinomas are likely to metastasize to pelvic and paraaortic lymph nodes, even if they seem to be early-stage cancers.

Several cases of recurrence after RT have recently been reported. Most of the recurrent cases were lateropelvic and/or distant lesions, probably because of higher rates of the histology of adenocarcinomas. Therefore, periodic examination by CT scan or MRI will be important for this patient, too.

Recently, Steed and Covens reviewed obstetrical outcome after RT in published reports. They found 123 pregnancies after RT.[7] Of these pregnancies, 73% resulted in term deliveries, and the percentage of live births was 67%. The rate of second-trimester miscarriage in patients treated with RT has been reported to be as high as 12%,[8] primarily because of a high rate of premature rupture of the membranes.

Our patient also suffered premature rupture of the membranes at 32 gestational weeks, probably as a result of chorioamnionitis, although we tried to prevent intrauterine infection. We still do not know whether the use of prophylactic antibiotics or a urinastatin vaginal suppository can prevent first- and second-trimester pregnancy loss effectively. However, it would be true that not a few cases of first- and second-trimester pregnancy loss were caused by chorioamnionitis and the following preterm labor. Therefore, we believe that thorough prevention of vaginal infection during pregnancy might have an impact on the prevention of premature rupture of the membranes and subsequent preterm labor.

Further investigation on the prevention of intrauterine inflammation after RT will improve the pregnancy outcome of these patients.

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