Robert’s uterus with delayed diagnosis and potential consequences: a case report

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Abstract
A 24-year-old woman who wished to become pregnant presented to our hospital with an enlarged ovarian endometrioma and developmental abnormality of the uterus. Robert’s uterus complicated by hematosalpinx, ovarian endometrioma, and endometriosis were finally identified 1 year after previously being diagnosed with a cyst and uterine abnormality at a local hospital. The function of the salpinx and the pelvic environment were damaged because of the delayed diagnosis and operation. Gynecologists and sonologists should be aware of and alert to this rare entity while evaluating and managing cases of uterine abnormalities and endometriosis. Prompt early diagnosis and proper management of Robert’s uterus are important for avoiding future morbidity because these are major factors in protecting fertility.

Keywords
Endometriosis, fertility, hematosalpinx, ovarian endometrioma, Robert’s uterus, hematometra

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Introduction
The prevalence of uterine anomalies is approximately 0.50%. Robert’s uterus was

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first reported in 1970 as a rare variant of a complete, but oblique, septate uterus consisting of a non-communicating hemicavity and a contralateral unicorneate uterine cavity in a single uterine body with a normal fundus. We report a case of delayed diagnosis and treatment of Robert’s uterus, although ultrasound-guided hysteroscopy and laparoscopy were finally performed.

Case report

A 24-year-old woman presented to the Reproductive Endocrinology Department with the complaint of a gradually enlarging, right ovarian, chocolate cyst. The cyst (3 cm in diameter) and uterine developmental abnormality (complete septate uterus or bicornuate uterus) were found 1 year previously in a local hospital. However, this young woman wanted to attempt pregnancy because of normal levels of tumor biomarkers, without any other examinations or treatments. The patient attained menarche at 13 years old and had regular menstrual cycles every 30 days with a 7-day duration, accompanied by mild dysmenorrhea that occasionally required medication. A gynecological examination showed an anatomically normal vulva, vagina, and cervix. The uterus was a normal size, but the right corpus was slightly larger than the left.

Three-dimensional ultrasound showed that the uterus was divided by a septum. Therefore, a complete septate or bicornuate uterus was suspected. However, the right uterine hemicavity did not communicate with the single cervix, but was accompanied by mild dysmenorrhea that occasionally required medication. A gynecological examination showed an anatomically normal vulva, vagina, and cervix. The uterus was a normal size, but the right corpus was slightly larger than the left.

Laparoscopy showed that the basilar part of the uterus was wide with an obvious bulge on the right fundus due to hematometra (Figure 1b). Scattered violet blue nodules were observed on the outer surface of the uterus (endometriosis). Extensive adhesions were found among the adnexa, pelvic peritoneum, and posterior uterine wall. An ovarian endometrioma (nearly 1 cm) was removed from the left ovary after adhesiolysis. However, a hematosalpinx (7 × 5×5 cm), but not ovarian endometrioma, was evacuated from the right adnexa. The mucosa had disappeared from the inner surface of a dilated, thickened, and stiff right fallopian tube. Hydrotubation with methylene blue was performed. However, the liquid dye did not exit the distal end of the right fallopian tube.

During hysteroscopy, a thick muscular septum was found to extend from the fundus to the internal os (Figure 1c). A left uterine hemicavity with a single ostium was identified without any communication with the right hemicavity. A longitudinal incision of the asymmetric septum with a bipolar needle electrode under transabdominal ultrasonic monitoring was performed to enter the right cavity (Figure 1d). The corresponding tubal ostium and endometrium were identified. The methylene blue dye then exited the distal end of the right fallopian tube. Foley’s catheter, which was inflated with 7 mL of normal saline, was then placed in the uterine cavity for 7 days. Hyaluronic acid gel was then injected into the cavity after the catheter was pulled out. A follow-up three-dimensional ultrasound 1 month later showed a larger normal uterine cavity (Figure 1e). During a mini-hysteroscopic (2.9 mm in diameter) examination, bilateral tubal ostia were finally observed, with mild postsurgical bulge in the upper part between the two cavities (Figure 1f). The patient experienced regular menstruation postoperatively, with a normal volume,
but without dysmenorrhea. She has been attempting to become pregnant for 7 months up to December 2020.

**Discussion**

Robert’s uterus is an uncommon congenital Mullerian abnormality, with one blind hemicavity and a contralateral unicorneate uterine cavity. Unilateral cervical aplasia should be present according to classification of the European Society of Human Reproduction and Embryology–European Society for Gynaecological Endoscopy. However, the cervix is normal in some cases, which demonstrates the
embryological/anatomical paradox of the European Society of Human Reproduction and Embryology–European Society for Gynaecological Endoscopy classification for this abnormality. Unilateral hematometra, hematosalpinx, and endometriosis are secondary features of Robert’s uterus. Robert’s uterus can be divided into three clinical categories by the status of hematometra in the blind hemicavity as follows: with a large hematometra in the blind hemicavity and acute pelvic pain; with an inactive blind hemicavity without hematometra and recurrent miscarriages; and with a small hematometra in the blind hemicavity.

Blind horns are more common on the right side because the left Müllerian duct advances slightly ahead of a right Robert’s uterus. However, a left Robert’s uterus has occasionally been reported.

Rare complications of Robert’s uterus, such as pregnancy in the blind cavity (considered as one type of ectopic pregnancy), unique ipsilateral renal agenesis, and a bicornuate uterus, have been reported. In contrast to the classical symptoms, Robert’s uterus in the present patient did not show prominent symptoms related to hematometra as previously reported. Therefore, diagnosis and treatment were delayed and the function of the salpinx and pelvic environment were severely damaged. Three-dimensional ultrasound and magnetic resonance imaging are suggested as being useful for evaluating Robert’s uterus. In the differential diagnosis, a unicornuate uterus with non-communicating rudimentary horn should be considered.

Management of Robert’s uterus is not fully established because of the few reports on this condition. Drainage and prevention of recurrence of hematometra, and excision of adnexal endometriomas and hematosalpinx are the main therapies. Robert’s uterus was typically previously managed via laparotomy (hysterotomy incision, horn resection, and repair of the myometrium) or endometrectomy of the blind cavity. However, in a previous report, a scar formed around the operation site, the cavity shape and volume of the uterus were not improved, and placenta accreta had the possibility of occurring during pregnancy (amputation and ablative surgical therapy). All of these factors greatly postponed the following attempt at pregnancy.

Currently, ultrasound combined with hysteroscopy is considered as a practical, minimally invasive, safe choice for Robert’s uterus, and this could be an option in women without visible signs of endometriosis in ultrasound (https://www.youtube.com/watch?v=4DWwCrwEeF4). Use of laparoscopy may be helpful for some conditions, such as infertility with hematosalpinx. These methods significantly reduce surgical trauma, result in prompt postoperative recovery, and preserve the integrity of the uterus, which are good for protecting fertility. However, if doctors do not have sufficient expertise in treatment or the patient is young and without any major symptoms, conservative management with long-term follow-up, but delayed therapy, could be considered.

To protect fertility and avoid inappropriate management, gynecologists and sonologists should be aware of and alert to Robert’s uterus while evaluating and managing cases of uterine abnormality and endometriosis. Prompt early diagnosis and proper management of Robert’s uterus are important for avoiding future morbidity, and these are major factors for protecting fertility.

Ethics statement

The patient gave informed consent for treatment and publication of this case report. Approval by the Medical Ethics Committee of West China Second University Hospital of Sichuan University (No. 128) was received for
publication of this case report. The CARE guidelines were followed for this case report.

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Declaration of conflicting interest
The authors declare that there is no conflict of interest.

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