

Successful pregnancy after repairing of unscarred uterine rupture during midtrimester: case study and literature review

F. Yuling, A. Tiekui, S. Qifang

Department of Obstetrics and Gynecology, The Second Hospital of Yinzhou, Ningbo (China)

Summary

Spontaneous uterine rupture (UR) is extremely uncommon before the onset of the delivery and in nulliparous women with no scar uterus. In this article the authors present a rare case of UR in a primigravid woman at the second trimester and repaired the uterus successfully, which prolonged the pregnancy, and achieved a successful outcome.

Key words: Second trimester uterine rupture; Unscarred uterus; Live birth; Acute abdomen; Pregnancy; Complication; Collagen fleece.

Introduction

Spontaneous uterine rupture (UR) is a rare complication of pregnancy, Rupture of unscarred uterus is a rare event involving 1/17,000–20,000 and it occurs in the older multifarious patients more frequently than in the younger ones [1]. Once it has occurred, it will be lethal both to the fetus and the mother. History of a uterine scar performed for cesarean section, myomectomy or partial uterine resection is a well-known risk factor for UR during the delivery or oxytocin for labor induction. UR is extremely uncommon before the onset of the delivery and in nulliparous women with no scar uterus. In this article the authors present a rare case of UR in a primigravid woman at the second trimester and repaired the uterus successfully, which prolonged the pregnancy, and achieved a successful outcome. The case is being reported due to its rarity.

Case Report

A 27-year-old Chinese woman, gravida 1 and para 0, was referred to hospital because of abdominal pain with nausea and vomiting, at 19 weeks and two days of gestation. Her medical history included a hysteroscopy combined with laparoscopy performed for primary infertility (seven months before getting pregnant). In the operation a diameter of 4 cm of endometrial cyst in the left ovary and serious pelvic endometriosis were found. No hormone therapy was prescribed after the operation.

The cervix was 0 cm dilated and was not effaced. Non-stress test showed 140–150 bpm heart rate with no decelerations, and contraction of the uterus was not found. The hemodynamic status was stable, and the vital signs were normal; blood pressure: 90/60 mmHg; pulse: 78/minute.

Her hemoglobin 11.3 g/dL and white blood cell count 9,100/ μ L. Ultrasonography revealed echo-free space in the vesicouterine pouch, suggesting hemoperitoneum. The abdominal pain was not obvious after 12 hours. Intra-abdominal bleeding was not increased, but the blood routine examination revealed a hemoglobin of 99 g/dL and white blood cell count was 17.97/ μ L. Twenty-four hours later signs of abdominal pain accompanied by nausea and vomiting increased. Ultrasonography revealed intraperitoneal fluid increased. Her hemoglobin was 7.8 g/dL and white blood cell count was 17.10/ μ L. Her fetal heart rate was in the normal range during the whole course.

The woman received tocolysis treatment with magnesium sulfate, but her abdominal pain had no relief. Next treatment was with intravenous fluids and antibiotics. Consultation with general surgery unit was made to rule out surgical pathology. Diagnosed by peritoneal puncture achieved no clotting blood after 24 hours and exploratory laparotomy was performed.

At the emergency laparotomy 2,300 mL fresh blood and clots were evacuated from the abdominal cavity. Irregular cracks about 6 cm long were found on the posterior wall of uterus. The tear extended into one-third of posterior uterine wall. The uterine vessels were not torn, but small actively bleeding vessels at the ruptured site were present.

The authors planned termination of pregnancy and repair of the ruptured uterus, but her families refused, as they wanted to continue it after reparation of the UR. The defect was repaired with a single layer stitch suture of 3–0 polyglactin 910, subsequently covered using medical collagen sponge. The patient lost 2,300 ml blood, for which she received four units of red blood cells.

To prevent UR, the woman received continuous use of a

tocolytic agent, nifedipine tablets with bed rest. Monitoring of both fetus and mother continued, especially for uterine integrity. MRI examination was performed at 24 weeks of gestation, which suggested that the posterior wall of the uterus had no defect. There was no evidence of placenta. At 34 weeks, the woman complained of tenderness at the fundus of the uterus. She was taken for elective cesarean section at 35 weeks and a healthy baby weighing 2,500 grams was delivered with normal Apgar scores. Mother and baby were discharged home in a good condition. At six weeks postnatal review, both mother and baby were well. The woman was advised that future pregnancies should be monitored carefully from first trimester and delivery achieved electively by cesarean section before the onset of the delivery because of the risk of another UR.

Discussion

Hemoperitoneum resulting from a rupture of an unscarred uterus is a rare condition of pregnancy [2] and is a life-threatening obstetrical emergency for both mother and fetus, since it causes severe hemorrhage, severe postpartum bleeding, and maternal morbidity and mortality unless they are diagnosed antenatally [3]. In most cases, it mainly occurs in the third trimester with risk factors and is rarely seen during the first or second trimesters without common risk factors; during the second trimester it usually occurs after induction for pregnancy termination in a scarred uterus. The clinical presentation of UR varies and should be considered as a differential diagnosis in pregnant women presenting with acute abdomen [4]. Kiseli reported a case of UR where the patient was symptomatic for diffuse abdominal pain and the ultrasonographic image was interpreted as amniotic band. Four days later, because of deterioration of the patient and fetal bradycardia, emergency laparotomy was performed before diagnosis [5]. In fact, the diagnosis may have been delayed or may have even been established at the time of laparotomy. Ultrasound findings of intrauterine pregnancy with free fluid do not exclude UR. Detection of ischemic uterine muscle on MRI may predict potential for UR in a subsequent pregnancy [6]. Searching for non-gynaecological causes in such clinical presentations might delay crucial surgical intervention, which leads to unnecessary morbidity, mortality or loss of obstetrics function [7]. Rupture of the uterus should be considered in pregnant women with hemoperitoneum, even when cesarean section is absent from the obstetric history. Obstetricians should be attentive to the possibility of spontaneous UR in pregnant women who have previous intrauterine manipulations, especially for pregnancies with primary infertility for serious pelvic endometriosis. Every obstetrician is bound to face the challenge of this life-threatening obstetric hazard and must be prepared to handle this emergency with an expeditious recourse to laparotomy [8].

Uccella *et al.* performed a review of the literature to provide more insight into the possible risk factors for prelabor UR in primigravida women, and partial wall defect was the principal recognizable risk factor for UR before the onset of labor. In the review, 52.2% women with specific available information had a history of infertility [9]. In the present case, no risk factor for UR was evident, and the authors speculate that possible contributing factors to the rupture were due to the likelihood of iatrogenic damage before pregnancy when hysteroscopy combined with laparoscopy were performed for primary infertility. A possible explanation could be that infertile patients more frequently undergo diagnostic/operative procedures on their uterus during diagnostic investigation or treatment.

It was thought to be impossible to prolong the pregnancy in a case of UR in the second trimester. In the present case, with rupture of the pregnant uterus in mid-trimester, the authors repaired with suture and overlapping of collagen sponge, resulting in pregnancy prolongation until the 35th week. Reviewing the present case and previously reported ones, the authors suggest that UR in mid-trimester could be repaired with suture and overlapping of collagen sponge in the absence of placenta percreta. Sugawara *et al.* reported six women who experienced second-trimester uterine dehiscence that had undergone surgical repair using collagen fleece, and delivered at ≥ 33 weeks [10]. Repair of the ruptured uterus could possibly lead to pregnancy prolongation, and consequently could yield favorable maternal and fetal or neonatal outcomes. Therefore, collagen fleece may reinforce the uterine defect, assisted uterine integrity in combination with a program of uterine tocolysis, and close maternal/fetal surveillance averting a pregnancy loss.

In conclusion, spontaneous rupture prior to labor is rare, and unscarred uterus, especially in the second trimester, is extremely rare. Clinical suspicion and early diagnosis may represent the only possibilities to preserve maternal and perinatal outcomes. UR in mid-trimester could be repaired with suture and overlapping of collagen sponge. It is important to rule out placenta percreta by repeated ultrasonographic examination. When placenta percreta is suspected, precise ultrasound monitoring or diagnostic laparotomy might be necessary after repair [11]. Due to the rarity of its occurrence, more evidence should be registered to increase the knowledge about this potentially lethal complication.

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Corresponding Author:

QIFANG SHENG, M.D.

Department of Obstetrics and Gynecology

The Second Hospital of Yinzhou, Ningbo, Zhejiang

315000 (China)

e-mail: 814153562@qq.com