

# Uterine rupture during pregnancy

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## Summary

**Background:** Despite great advances in modern obstetrics, uterine rupture (UR) remains one of the most frightening complications with high morbidity and mortality. **Objective:** To improve the diagnosis and management of UR. **Results:** We report two cases of UR. Case 1 was spontaneous UR and case 2 was associated with a scar in the patient's uterus. Interestingly, the ruptured scar was not a scar from a previous cesarean section; it was a scar that was associated with placenta accreta. The fetal heart rates in both cases were below 80 beats per minute after UR. The newborn in case 1 died soon after delivery, while the newborn in case 2 survived. Both women were healthy and were discharged from hospital two to three weeks after surgery. **Conclusion:** UR can occur in a previously unscarred uterus or from a scar of a cesarean section or scars caused by other pathologic lesions in the uterus. Severe fetal bradycardia might be a strong indicator for UR. Such study will help obstetricians provide more careful measures to manage UR, so that its morbidity and mortality can be decreased.

**Key words:** Uterine; Rupture; Pregnancy.

## Case Reports

### Case 1

A 29-year-old woman (gravida 1, para 0) was hospitalized complaining of moderate left-upper abdominal pain as well as nausea and vomiting. This was her first pregnancy at 29 weeks' gestation. She had a history of successful laparoscopy and hysteroscopy examination three months before pregnancy and no complications occurred. She had normal blood pressure and heart rate when admitted to the hospital. The physical examination revealed a mild tenderness of the abdomen. Ultrasonography (US) suggested that the uterus was abnormal. The left corner of the uterus extruded to form a mass 11.2 x 10.6 x 10.2 cm<sup>3</sup> in size. The border of the mass was clear and the wall was thin (0.3 cm in thickness). A part of the living fetus could be detected inside the mass. One hour after being admitted to the hospital, the patient suddenly complained of acute severe pain on the upper left side of the abdomen. Her blood pressure decreased and her heart rate increased quickly. The fetal heart rate also decreased significantly to 70 beats per minute (bpm). Emergent laparotomy was performed and 600 ml of blood was found in the abdominal cavity. The rupture was on the left side of the midline below the fundus, with 8 cm in length (Figure 1). Although the amniotic sac was complete, unfortunately, the fetus could not be resuscitated (Apgar score was 0 one min. after delivery). Repair of the ruptured uterus was performed and the patient was discharged from hospital two weeks after surgery.

### Case 2

A 34-year-old woman (gravida 3, para 1) at 34 weeks and four days of gestation complained of abdominal pain after bathing and was hospitalized. Physical examination revealed

that she had moderate abdominal tenderness. US suggested that a previous cesarean section scar was complete, and the fetal movement remained satisfactory, but intraperitoneal blood was detected in the amount of 400 ml. Rupture of the previous cesarean section scar was suspected. During the time of preparation for the operation, suddenly the patient's blood pressure dropped and her heart rate increased quickly while the fetal heart rate decreased significantly to 80 bpm. An emergency operation was performed and 2000 ml blood was found in the patient's abdominal cavity, but the previous cesarean scar was not ruptured. The neonate weighed 2,330 g, and the Apgar score was 8 one minute after delivery. After delivery of the fetus and placenta, we found a complete uterine rupture at the fundus of the uterus 6 cm in length, and the wound was still actively bleed-



Figure 1. — Rupture (about 8 cm in length) was on the left side of the midline below the fundus of the uterus.

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ing. Repair of the ruptured uterus was successfully performed. Her medical record was sent from the institution where the cesarean section had been performed, which indicated that due to placenta accreta during her first pregnancy, the fundus of the uterus had been partially cut. Obviously, UR in this patient was directly associated with the scar in the fundus of the uterus. The patient and the neonate were both discharged from hospital three weeks after surgery.

## Discussion

UR is defined as the tearing of the uterine wall during pregnancy or delivery. It is regarded as an obstetric catastrophe and is a devastating complication for the family. Despite great advances in modern obstetrics, UR remains one of the most frightening complications in obstetric care with high morbidity and mortality. The most common cause of UR is separation of a previous cesarean section scar [1]. Other common predisposing factors to UR such as previous traumatizing operations or manipulations have also been reported [1]. Rupture of an unscarred uterus is rarely reported [2]. In this study, we have reported two cases of UR. One had no obvious reason and the other was associated with a scar in the patient's uterus. Interestingly, the ruptured scar was not the scar of the cesarean section, but rather a scar that was associated with previous placenta accreta. This report is unique since it should remind obstetricians that they need not only be aware of the possible existence of UR in an unscarred uterus, but also of the fact that an existing scar associated with a cesarean section might not be the reason for UR.

UR complicates about 0.05-0.1% of all pregnancies [2]. Rupture of a previously unscarred uterus is rare and usually results in death of the fetus. The incidence of unscarred uterus rupture is only about one in 15,000 deliveries [1]. Fetal mortality is about 70% with either spontaneous uterine rupture [1]. In our first case, although the patient had a clear history of laparoscopy and hysteroscopy examination three months before pregnancy, this should have contributed little to her UR because the two examinations were both very successful without any complications. It is really hard for us to provide a reasonable explanation to explain why the uterus ruptured on the left side of the midline below the fundus. Therefore, this case was regarded as a spontaneous UR. In this patient, the ruptured uterus was successfully preserved since the bleeding was controlled by suturing, but no biopsy was performed during the emergent operation. Thus, we could not exclude the possibility that an underlying pathologic lesion caused the rupture of her uterus. Unfortunately, the delivered neonate died soon after delivery which is consistent with the notion that fetal mortality is very high in spontaneous UR [1].

In our second case, the cause of UR seemed to be associated with a cesarean section scar before emergent surgery, but in fact, it was associated with a scar of the uterine fundus due to the previous placenta accreta. The scar associated with the placenta accreta was more pathologic when compared to the one associated with the cesarean section. Therefore, it is the scar associated with pathologic lesions such as placenta accreta rather than a scar of a

cesarean section that might have been the reason for a ruptured uterus.

Due to the high morbidity and mortality of UR [1, 2], it is important that women at increased risk of UR be identified as early as possible. Antenatal imaging techniques such as US and MRI and the patient's clinical symptoms and signs might be helpful [1-3], but the fetal heart rate pattern on the cardiotocography continues to be the main indicator for detection of early UR [4, 5]. Continuous fetal heart rate monitoring should be recommended for women suspected with UR. It has been reported that severe fetal bradycardia is strongly associated with UR [4, 5]. This is also true in this report because the fetal heart rates were both below 80 bpm.

In fact, obstetricians should always be consulted by the patient and her family about the risk of UR in any subsequent pregnancies. Shipp *et al.* reported that the risk of UR during labor after cesarean delivery was increased if the delivery interval was less than 18 months when compared to that if the interval was longer [6]. Therefore, a minimum of an 18-month interval to the following delivery should be strongly recommended if a patient wants to go through labor in future pregnancies.

In conclusion, UR can occur in a previously unscarred uterus, the scar of a cesarean section, or scars in the uterus caused by other pathologic lesions. Severe fetal bradycardia might be a strong indicator of UR. Such study will help obstetricians provide more careful measures to manage UR, so that its morbidity and mortality can be decreased.

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