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Review

Successful delivery after surgical repair of uterine rupture at 15 weeks of gestation: case report and brief review

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ABSTRACT

Objective: Second-trimester uterine rupture is a rare disorder and it is unclear if it should be managed with caesarean section, repair or hysterectomy. This article provides a case report of second-trimester uterine rupture repair, and reviews the risk factors, signs and symptoms, suturing technique and newborn outcome.
Methods: PubMed was searched using the terms 'uterine rupture', 'second trimester' and 'repair' Only cases of second-trimester uterine rupture repair that led to successful prolongation of pregnancy were included.
Results: The main risk factor of uterine rupture is previous caesarean section (5/10, 50%). Eight of 10 cases presented with abdominal pain and three cases presented in shock. Haemoperitoneum was present in five cases. The mean and median gestational age at delivery were 33.4 and 33.5 weeks, respectively (range 28–37 weeks), with mean and median delayed interval delivery of 95.5 and 91 days, respectively (range 14–147 days). Neonatal outcome was good for 10 of 11 newborns. Despite the early onset of uterine rupture, there were no cases of extremely preterm delivery. One early preterm infant, seven moderate-to-late preterm infants and one term infant were delivered.
Conclusions: The lack of extremely preterm deliveries and good neonatal outcomes encourage attempts to repair the uterus after second-trimester rupture.

Contents

Introduction

Rupture of the pregnant uterus is a rare disorder that occurs in less than 0.05% of pregnancies [1]. Reports of spontaneous uterine rupture in the early trimesters are rare [2]. Uterine rupture caused by separation of the uterine myometrium is a life-threatening condition for the mother and foetus. Complete uterine rupture cannot usually be predicted and occurs suddenly during labour or delivery. During the pre-viable period, it is not known whether caesarean section, uterine repair or hysterectomy represents the best approach [3].

This article reports a case of uterine rupture that occurred during the early second trimester. Repair of the rupture site using uterine suturing led to successful prolongation of pregnancy.

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Case report

A 40-year-old Russian woman (gravida 2, para 1) was referred to the authors' hospital with progressive abdominal pain at 15 + 5 weeks of gestation. Her first pregnancy had resulted in preterm caesarean delivery at 27 weeks of gestation for placental abruption, leading to stillbirth. She denied abdominal trauma, fever, nausea, anorexia, vomiting or vaginal bleeding. Up to that point, her current pregnancy had been uneventful. She had conceived naturally, without any assisted reproductive treatment. A previous second-trimester ultrasound had normal results.

At admission, her vital signs were normal with blood pressure of 110/60 mmHg and pulse of 66 beats/min. Haematocrit was 34.8%, haemoglobin was 12.3 g/dl and white blood cell count was 9500/μl. On abdominal examination, she reported pain in the entire abdomen; the pain was stronger around the right hypochondriac region with rebound tenderness. Bowel sounds were audible but weak. Pelvic examination showed normal secretions, no vaginal bleeding and no cervical dilation. Her cervix was closed, thick, firm and posterior. Transvaginal ultrasonography revealed a regular cervical length (39 mm) without funnelling, no fluid collection in the cul-de-sac space, and a single intrauterine pregnancy with positive foetal heart activity. The placenta was located on the anterior uterine wall above the lower uterine segment. Other organs, including the kidneys, gallbladder and liver, were sonographically normal. Over the 3 h following admission, her symptoms gradually worsened and haemoglobin decreased to 8.5 g/dl. An additional ultrasound examination revealed echo-free space in the vesico-uterine pouch, suggesting haemoperitoneum and a foetus with cardiac activity. The initial diagnosis was appendicitis or ovarian torsion, so exploratory laparoscopy was performed. Before the medical procedure, the patient was advised about the potential risks and benefits of the intervention, and she gave her informed consent. Haemoperitoneum (1000 g of blood loss) was found with a myometrial defect on the anterior uterine wall. Uterine rupture with complete opening of the uterine wall at the site of the previous transverse scar was found, with protrusion of the placenta. Conversion to open surgery was necessary. The ruptured uterus was repaired using two-layered separate stitch sutures of 1–0 polyglactin 910 (Coated Vicryl, Ethicon, Inc., Somerville, NJ, USA) (Fig. 1). The patient's postoperative recovery was uneventful and she was discharged on the fifth postoperative day. She was informed of the potential risks of this conservative management and was discharged home. A healthy baby (weight 2640 g, normal Apgar scores) was delivered by elective traditional caesarean section because of placenta praevia at 36 weeks of gestation.

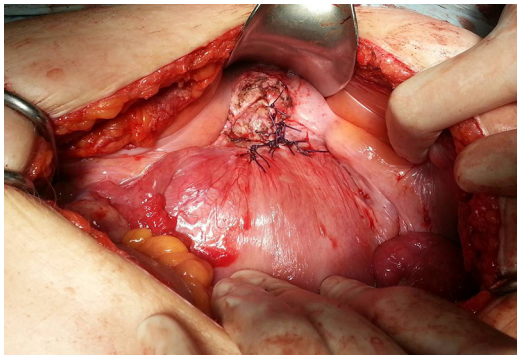

Fig. 1. Uterine repair.

Brief review

PubMed was searched using the terms 'uterine rupture', 'second trimester' and 'repair' [4]. Thirty-seven articles were checked and nine documents were extracted [5–13]. Data are summarized in Tables 1 and 2.

The main risk factor for uterine rupture was previous caesarean section (5/10, 50%), but uterine rupture also occurred in the absence of risk factors in three cases (30%). One patient had experienced uterine rupture previously. Nine patients had a singleton pregnancy (90%) and five patients were primiparae. Maternal age ranged from 28 to 40 years (mean 31.6, median 30.5 years). The mean and median onset of uterine rupture were 19.8 and 20 weeks, respectively (range 13–26).

In 60% of patients (6/10), there were no detectable ultrasound patterns. Eight patients presented to the emergency room with abdominal pain and three patients presented in shock. Haemoperitoneum was present in five patients. Fever and vaginal bleeding ware detected in one patient, and vomiting was absent in all patients. Two patients had foetal tachycardia.

The uterine suture was made by single-layered stiches, two-layered stitches and three-layered stitches in five, four cases and one patients, respectively; no differences were found between these techniques in terms of maternal and foetal outcomes. Mean and median gestational age at delivery were 33.4 and 33.5 weeks, respectively (range 28–37 weeks), with mean and median delayed interval delivery of 95.5 and 91 days, respectively (range 14–147). Sixty-percent of patients had an elective caesarean section, and the remaining 40% had an emergency caesarean section. No patients underwent hysterectomy. The neonatal outcome was good for 10 of the 11 newborns (one twin died postpartum). Despite the early onset of uterine rupture, there were no cases of extremely preterm delivery. One early preterm infant, seven moderate-to-late preterm infants and one term infant were delivered.

Comment

Several reports have been published regarding repair of uterine rupture in the second trimester by suturing and/or patching [14]. The subsequent pregnancy outcome after conservative management of uterine rupture was only been studied in small case series, among which the prevalence of recurrence ranged from approximately 0 to 33% [15].

Risk factors for third-trimester uterine rupture in labour are well known; nevertheless, data on spontaneous second- and early third-trimester uterine rupture before labour remain very limited [16]. This brief review identified a previous caesarean section as the main risk factor for uterine rupture [17]. However, three of the 10 cases of uterine rupture had no demonstrable risk factors. Rupture of the unscarred pregnant uterus is a rare event, estimated to occur in one in 5700 to one in 20,000 pregnancies [18]. Unscarred uterine rupture is a rare event that usually occurs in late pregnancy or during labour. Risk factors for this condition include high parity, placental abnormalities and uterine anomaly, but none of these factors were present in this series. Although rare, primary uterine rupture is particularly morbid [19,20]. Uterine rupture can occur at any time during gestation and may be difficult to predict [21]. Therefore, uterine rupture must be considered in differential diagnoses of severe abdominal pain, even in the early second trimester.

Clinical signs of uterine rupture in early pregnancy are non-specific and must be distinguished from acute abdominal emergencies.

Abdominal pain, vaginal bleeding and vomiting are classic findings [22]. This brief review detected abdominal pain as the only main clinical sign, not necessarily associated with acute abdomen or haemoperitoneum. The pain was non-specific and began hours