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Spontaneous Rupture in a Non-Laboring Uterus at 20 Weeks: A Case Report

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Data Interpretation D
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Conflict of interest: None declared

Patient: Female, 31-year-old
Final Diagnosis: Uterine rupture secondary to placenta percreta
Symptoms: Acute abdomen
Medication: —
Clinical Procedure: Laparotomy and subtotal hysterectomy
Specialty: Obstetrics and Gynecology

Objective: Unusual clinical course

Background: Uterine rupture is uncommon but when it happens, it can cause significant morbidity and mortality to both mother and fetus. Incidence reportedly is higher in scarred than in unscarred uteri. Most cases occur in laboring women in their third trimester with a previous history of uterine surgery, such as caesarean delivery or myomectomy. We present a case of spontaneous uterine rupture in a non-laboring uterus in the mid-trimester of pregnancy.

Case Report: The patient presented with threatened miscarriage at 17 weeks' gestation and ultrasound findings were that raised suspicion of a morbidly adherent placenta. Her history was significant for two previous cesarean deliveries more than 5 years ago followed by two spontaneous complete miscarriages in the first trimester. The patient was managed conservatively until 20 weeks' gestation, when she presented with acute abdomen with hypotensive shock. Her hemoglobin dropped to a level such that she required blood transfusion. An emergency exploratory laparotomy was performed, which revealed a 5-cm rupture in the lower part of the anterior wall of the uterus, out of which there was extrusion of part of the placenta. Given the patient's massive bleeding, the decision was made to proceed with subtotal hysterectomy. Histopathology of the specimen confirmed the diagnosis of placenta percreta.

Conclusions: Identification of uterine scarring with morbidly adherent placenta is crucial because even in early pregnancy, it can lead to uterine rupture. Furthermore, failure to recognize and promptly manage uterine rupture may prove fatal.

MeSH Keywords: Case Reports• Placenta Accreta • Pregnancy Trimester, Second • Risk Factors • Rupture, Spontaneous • Uterine Rupture

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Background

Although uncommon, uterine rupture is a serious obstetrics complication that can cause significant maternal and fetal morbidity and mortality. A population-based cohort study in the Netherlands found that incidence of uterine rupture in scarred uteri was 5.1 per 10 000 births [1]. A prospective study in India revealed that the overall incidence of uterine rupture was 0.35%, and there, women without and with scarred uteri have 1.5 and 1.7 times higher risks for rupture, respectively, than women in other developed countries [2]. Uterine rupture can cause massive hemorrhage and extensive damage to the uterus, leading to hysterectomy when the uterus is beyond repair. It can lead to significant disruption of blood, and hence, oxygen supply to the fetus, which can cause temporary or permanent hypoxic injury to the fetus, and in worst scenario, fetal death. Most of the cases of uterine rupture described in previous literatures have involved women with a history of previous uterine surgery, such as cesarean delivery or myomectomy, usually occurred in the third trimester during labor. Uterine rupture without onset of labor is an unusual presentation, as persistent uterine contraction is what typically leads to scar dehiscence and the subsequent rupture. We present a case of spontaneous uterine rupture in a non-laboring uterus in the mid-trimester of pregnancy.

Case Report

A 31-year-old woman in her fifth pregnancy presented at 17 weeks' gestation with painless per vaginal bleeding. She had experienced intermittent staining per vagina since early pregnancy, which was diagnosed as threatened miscarriage. The patient had two previous caesarean deliveries both for major placenta previa more than 5 years prior to this pregnancy, and two uncomplicated first-trimester spontaneous miscarriages. Examination revealed a soft abdomen with an 18-week size, non-irritable uterus. Transabdominal ultrasonography showed a viable fetus with fetal growth parameters equivalent to 18 weeks' gestation. The placenta was low-lying and there was no distinct plane of demarcation between the placenta and the uterine wall, with some placental lakes noted with high probability of adherent placenta. The patient was counselled about the need for regular ultrasound for surveillance and magnetic resonance imaging (MRI) in the third trimester was planned.

At 20 weeks' gestation, the woman presented to the district hospital with sudden onset of severe lower abdominal pain associated with vomiting. She had no vaginal bleeding but she was hemodynamically unstable and needed prompt fluid resuscitation. Her hemoglobin level dropped to 8.3 g/dL and she was transfused with 1 pint of packed red blood cells (PRBCs) and immediately transferred to the tertiary hospital. Upon arrival, the patient was in severe pain, pale, tachycardic, and hypotensive. Her abdomen was soft with a tender uterus of approximately 20-week size. Ultrasonography revealed a viable 20-week fetus with anterior placenta, which was still low-lying, and presence of placental lakes posterior to the bladder. There was free fluid seen at Morrison's pouch. Repeat blood testing showed that the patient's hemoglobin level had dropped further, to 6.6 g/dL.

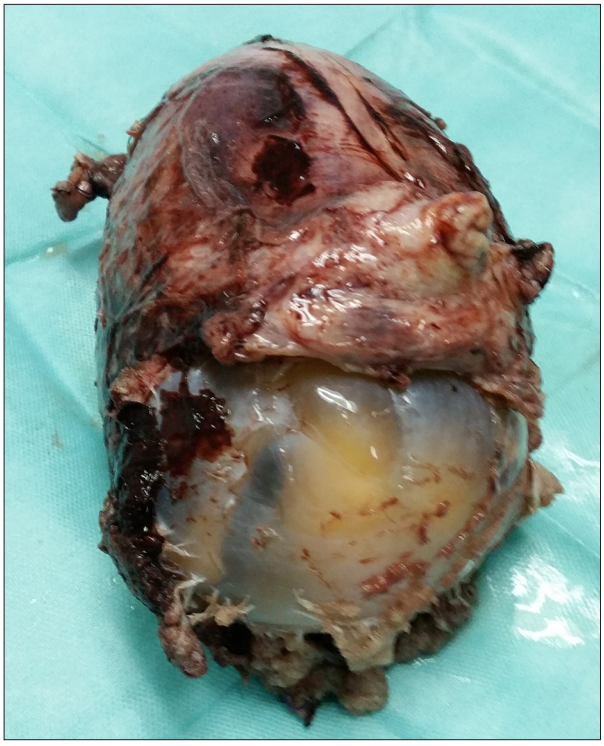

Figure 1. Post subtotal hysterectomy specimen showing uterine rupture with intact amniotic sac and fetus *in situ*.

A diagnosis of intra-abdominal hemorrhage likely due to uterine rupture was made, therefore, emergency exploratory laparotomy was arranged. Intraoperatively, there was a 5-cm rupture in the lower part of the anterior uterine wall and out of which part of the placenta was extruding, with ongoing active bleeding. The decision was made to perform a subtotal hysterectomy with the fetus *in situ* (Figures 1, 2). The patient received 7 pints of PRBCs and one cycle of a regimen for disseminated intravascular coagulopathy (DIVC). She recovered well postoperatively and was discharged on Day 5.

Histopathology of the specimen showed placental tissue adherent to the uterine wall with an intervening layer of decidua. There was evidence of chorionic villi infiltrating the myometrium with no layer of intervening decidua in some focal areas. The lower uterine wall and endocervix was thinned out and showed areas of chorionic villi perforating the muscular

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Figure 2. Stillbirth protruding out after iatrogenic rupture of the amniotic sac.

wall, with focal area of necrosis and hematoma on the placenta. These findings were consistent with placenta percreta.

The patient was followed up in the outpatient clinic 2 months following discharge and reported no complications. She fully understood the diagnosis and its implication.

Discussion

Uterine rupture during pregnancy is rare and can occur in women with native, unscarred uteri or in uteri with surgical scars from previous surgery. Incidence of uterine rupture in scarred uteri is higher than in unscarred uteri, as supported by studies from other countries such as the Netherlands and India [1,2]. In unscarred uteri, the incidence of uterine rupture was found to be 1 in 2770 deliveries [3]. A Swedish population-based cohort study showed that women who had previous uterine scar via cesarean delivery were at increased risk of uterine rupture in their second deliveries, compared to those who had previous vaginal deliveries [4]. Other risk factors include previous myomectomy scar, particularly one that has breached the uterine cavity. The risk is 0.6% to 0.75% in pregnancies after myomectomy [5]. On the other hand, uterine rupture in unscarred uteri typically occurs in the second stage of labor due to mismanaged labor, injudicious use of oxytocin, obstructed labor, or use of instrumental delivery [6].

Although uterine rupture is commonly associated with the laboring uterus, it has also been reported in the non-laboring uterus. Uterine rupture in the non-laboring uterus without external trauma is rare but cornual pregnancy and multiparity are two reported risk factors [7]. A case has been reported of a grand multipara with spontaneous rupture at 30 weeks in a scarred uterus [8]. Similarly, a case of spontaneous uterine rupture in a grand multipara with one cesarean delivery followed by four vaginal deliveries also has been reported [9]. In our case, the patient only had two pregnancies beyond 24 weeks, which should have made her less predisposed to uterine rupture. Both those pregnancies were delivered via cesarean. However, in a prospective, multicenter, observational study, no significant difference was found in the rate of uterine rupture between patients with a single cesarean delivery versus those with multiple such deliveries [10].

Uterine rupture usually occurs in the third trimester. In the first and second trimester, it is rare and the diagnosis is often made intraoperatively [11]. Most patients present with abdominal pain, vaginal bleeding, and hypotension [12]. In this case, the patient presented at 17 weeks' gestation, 3 weeks before the event with vaginal bleeding that was trivial and required only conservative measures. There was a suspicion of morbidly adherent low-lying placenta, but the incidence of uterine rupture due to placenta percreta is 1 in 5000 pregnant women, which is rare [13].

Recent evidence indicates that ultrasonography at 12 to 16 weeks' gestation can accurately predict morbidly adherent placenta [14]. The patient in this case had an ultrasound suspicious for morbidly adherent placenta when she first presented at 17 weeks' gestation. There was loss of uterine wall-bladder demarcation and presence of placental lakes. Other ultrasound features suggestive morbidly adherent placenta include non-visible cesarean scar, thin retroplacental myometrium, bladder wall interruption, and presence of intra-placental lacunar spaces. Other than that, three-dimensional power Doppler can demonstrate presence of retroplacental arterial-trophoblastic blood flow and irregular placental vascularization [14]. There is a suggested scoring module for prediction of intrapartum morbidly adherent placenta and maternal morbidity which assesses these features: placenta lacunae, retroplacental echo lucent space, retroplacental myometrium thickness, hyperechoic uterine-bladder interface, and vascularity of subplacental, uterine serosa-bladder wall, intra-placental and bladder wall [15].

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MRI plays a vital role in evaluation of inconclusive cases by ultrasonography. The sensitivity and specificity of MRI in evaluating the invasion topography in placenta percreta ranges from 87.5% to 100%. For prediction of parametrial, bladder, and cervical invasion, MRI has 100% specificity [16]. Therefore, MRI has an important role in confirmation of morbidly adherent placenta to enable precise mapping of placental abnormalities and aid multidisciplinary planning and management [17]. There are limited reports with regard to use of MRI in mid-trimester pregnancy for diagnosing this condition. However, a morbidly adherent placenta during mid-trimester can be diagnosed by an MRI finding of low-lying, inhomogeneous placenta, dysplastic vascular hypertrophy, ill-defined placental bands, and an overall impression of some areas of increta with no overt evidence of percreta [18].

Uterine rupture caused by placenta percreta can be more life-threatening than that caused by a previous scar because placenta percreta-induced uterine rupture exhibits more vascularization than the site of previous scar-induced rupture [19]. Morbidly adherent placenta, like increta and percreta, typically develops due to dehiscence of a previous uterine scar, thus facilitating better access by cells from the trophoblast column to the large outer myometrial vessels [20]. This explains the intraoperative finding in the patient in this case. That is, she had massive bleeding from the percreta-induced uterine rupture site, which led to the need for hysterectomy.

A retrospective analysis reported that subtotal hysterectomy is the most common surgical intervention for management of uterine rupture (73.6%) [21]. The procedure was performed in this case and it has been recommended as the best choice of surgical intervention for uterine rupture. With it, hemostatic control is faster, blood loss and need for blood transfusions reduced, there are fewer perioperative complications, and operating time is reduced [22]. However, subtotal hysterectomy has not been shown to provide protection against urinary tract injury [23]. In uterine rupture due to underlying morbidly adherent placenta that extends into the cervix, total hysterectomy is superior to subtotal hysterectomy particularly to ensure better hemostatic control [22]. Nonetheless, subtotal hysterectomy was effective in the case presented here because there was no cervical involvement.

Conclusions

The current trend of rising cesarean delivery globally inevitably had led to an increased incidence of both placenta previa and morbidly adherent placenta. Thus, it is crucial for clinicians to screen all pregnancies with previous uterine scar for morbidly adherent placenta during routine second-trimester ultrasonography. Early identification allows the provider time to prepare and plan for the high-risk nature of the delivery. Mid-trimester uterine rupture is a rare event; however, a high index of suspicion is crucial to allow early recognition and timely management in these cases, particularly with an underlying morbidly adherent placenta, so as to prevent a catastrophic and fatal outcome.

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