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Uterine rupture in a gravid, unscarred uterus: A case report

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ABSTRACT

When advising a pregnant patient who has previously had a cesarean section about the risks of trial of labor, it is important to explain the risk of uterine rupture. Subjective symptoms of abdominal pain or objective findings of non-reassuring fetal status and loss of fetal station are often indicative of this disease process, which most commonly is caused by a defect on the uterus from the cesarean delivery. Any uterine surgical intervention (myomectomy, for example) is the leading risk factor for uterine rupture. This case report presents a patient who had no such history. However, the maternal and fetal clinical status rapidly deteriorated and required emergency cesarean delivery, at which point a complete uterine rupture was diagnosed. Low suspicion for rare occurrences such as uterine rupture in an unscarred uterus can delay diagnosis, with increased likelihood of fetal and maternal morbidity and mortality.

1. Introduction

Uterine rupture in pregnancy is a life-threatening situation for both mother and fetus. It is a rare complication and is usually associated with a trial labor after cesarean delivery. Any previous uterine defect, such as from a myomectomy or other surgical intervention, is a known and important risk factor. Other risk factors, though even rarer and less well characterized, include a shortened inter-delivery interval, gestational age greater than 40 weeks, and a birth weight greater than 4000 g [1]. According to one study from the Netherlands, the incidence is between 0.7 and 5.1 per 10,000 deliveries in unscarred and scarred uteri, respectively [2]. Uterine rupture is an extremely rare event in a patient with a history of spontaneous vaginal deliveries and no obvious risk factors [2,3].

2. Case

A 40-year-old gravida 5, para 4 woman presented at 36 weeks and 2 days of pregnancy for evaluation after an office visit at which she had complained of headaches and spots in her vision. The patient had had a previous diagnosis of pre-eclampsia without severe features prior to presentation. Upon arrival, the patient was noted to have normal blood pressure (126/67 mmHg). However, she reported having a persistent headache, despite acetaminophen administration. She described the headache as left-sided and retro-orbital in location, and graded it as 2 out of 10 in severity (on a severity scale from 1 to 10, with 10 being the most severe). She denied any history of migraines, chronic headaches, or other neurologic disability. The patient also complained of "white spots" in her vision that appeared to be floating. She denied having any chest pain, shortness of breath, right upper quadrant pain, or bilateral upper extremity or facial swelling. Serum and urine tests for pre-eclampsia were repeated and no change from her previous baseline was noted. As such, the decision was initially made to re-administer acetaminophen with re-evaluation for possible relief of the headache.

Despite the acetaminophen, the patient continued to report visual disturbances and a persistent headache. After consultation with the maternal-fetal medicine department, the decision was made to proceed with induction of labor. Magnesium sulfate was started for seizure prophylaxis. A bedside ultrasound scan was performed prior to commencement of the induction, and the fetus was found to be in breech position. As the patient had had 4 vaginal deliveries in the past and was currently stable, she was deemed a good candidate for an external cephalic version (ECV). The alternative option, namely cesarean delivery, along with risks and benefits of the procedure were explained and the patient consented to an attempt at ECV. The ECV was performed successfully after administration of terbutaline and an epidural for pain management.

Shortly thereafter, the induction of labor was started with misoprostol for cervical dilation of 1 cm. In total, the patient received 2 timed doses of misoprostol. The induction was then continued with

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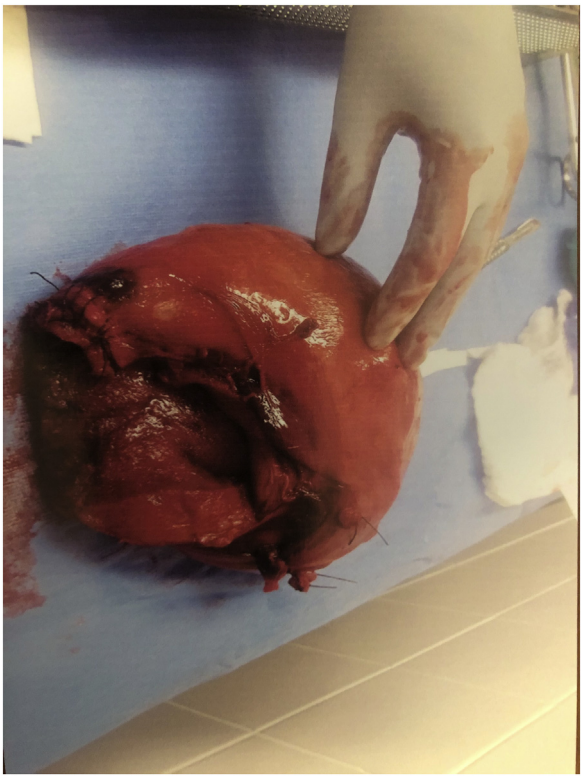

Fig. 1. Gross specimen of ruptured, left sidewall of the uterus after cesarean supracervical hysterectomy.

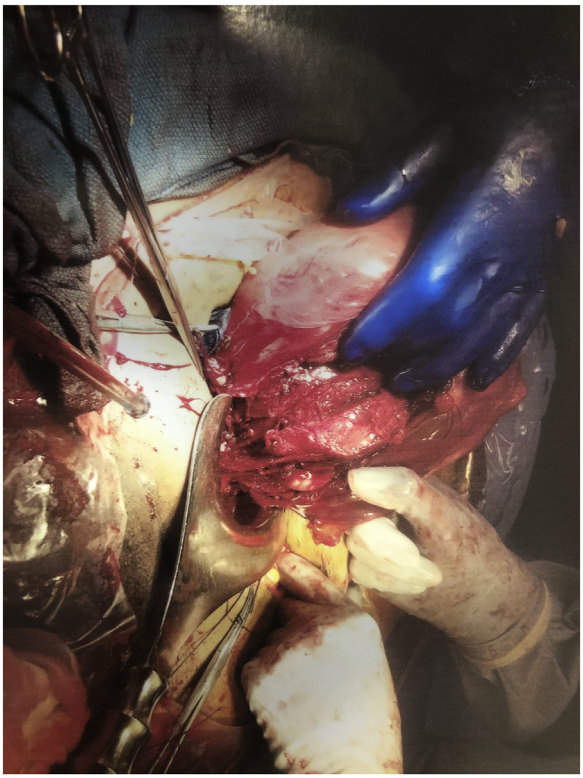

Fig. 2. Intra-operative image demonstrating complete uterine rupture of the anterior, left sidewall of the uterus. The surgeon's hand demonstrates the site of rupture extending fully to the posterior segment of the uterine wall.

Foley bulb placement, along with oxytocin for augmentation, as per institutional protocol. With incremental increases in oxytocin, the patient had intermittent episodes of tachysystole, for which the oxytocin was appropriately titrated. The overall fetal status was reassuring during this course.

While initial blood pressures were within normal ranges, the patient did experience severe episodes of abnormal blood pressure requiring IV administration of both labetalol and hydralazine. Blood pressures did return to baseline. After 26 h of induction, the fetal status became progressively less reassuring, with decreasing variability and multiple variable decelerations on fetal heart tone monitoring. This persisted despite supportive measures. At this time, the patient reported that she was in severe pain and she urgently requested epidural bolus.

Examination revealed a 6-centimeter dilated cervix that was edematous on palpation. There was then an abrupt, prolonged fetal deceleration that was not amenable to resuscitative measures (such as positional changes, supplemental oxygen, discontinuation of oxytocin, and administration of terbutaline sulfate). A further cervical examination demonstrated an anterior lip dilation. The decision was made to urgently proceed to the operating room for fetal delivery. While in the operating room, fetal heart tones were measured and noted to have returned to baseline and were reassuring. Thus, vacuum-assisted delivery was attempted. Despite two pulls of the vacuum, there was no change in fetal station. An emergency cesarean delivery was performed under general anesthesia.

Upon entry into the abdomen, a large amount of blood was evacuated. Suction to the uterus revealed a thin serosal layer overlying the uterus and an obvious uterine rupture (Figs. 1 and 2), with the fetus noted to be floating within the serosal sac. This was entered with blunt dissection of the surgeon's digit. The fetus was delivered without a fetal heart tone and was passed to the neonatologist, who successfully resuscitated the baby.

Uterine rupture was once again confirmed, with complete obliteration of the left side of the uterus into the uterine artery. There was extensive blood loss that required massive transfusion. The patient became hypotensive and required IV fluid and blood product resuscitation. Unfortunately, the uterine anatomy was severely distorted and the uterus could not be repaired. A supracervical hysterectomy was performed. Left salpingo-oophorectomy was also performed due to extensive bleeding from the uterine artery, which had dissected through the infundibulopelvic ligament and into the sidewall of the pelvis. Hemostasis was eventually achieved after transfusion of blood products.

After surgery, the patient remained under general anesthesia and was transferred to the intensive care unit for further monitoring and stabilization.

3. Discussion

The prevalence of uterine rupture in developed countries in women with previous cesarean sections has been reported to be as low as 1%. However, it is exceedingly rare in women without any history of cesarean section or other gynecological surgery [4]. In patients who have an unscarred uterus, there are reported risk factors that, though rare, can lead to possible rupture. These include macrosomia, shorter interval between deliveries, post-date pregnancies, and advanced maternal age. Women over 30 years of age have been reported to have two to three times the risk of uterine rupture for women who are younger than 30 years [1]. Other reported risk factors for rupture of an unscarred uterus include any uterine anomalies, grand multiparity, cephalopelvic disproportion, and uterine trauma, including version maneuvers and oxytocin stimulation [5]. However, there continues to be a debate on whether ECV is an independent risk factor for uterine rupture. One recent cohort study failed to demonstrate any association

between the two [6]. Of note, the American College of Obstetricians and Gynecologists (ACOG) states that ECV itself is not contraindicated in a woman with a previous low-transverse uterine incision [7]. Uterine distension from multiple gestations is another association with uterine rupture [8,9].

As uterine rupture is a rare complication, few large studies have examined this disease process. However, one study examining women who gave birth in Norway from 1967 to 2008 sought to examine specific risk factors for uterine rupture. The researchers discovered that, among women with an unscarred uterus, those aged over 35 years, having a parity of at least 3, being born in a non-Western country, and having a previous miscarriage before 12 weeks put them at a particularly high risk for rupture. Of greatest significance, they found that oxytocin has a higher odds ratio for rupture than induction with prostaglandins (6.5 and 4.5, respectively), and that the sequential use of prostaglandins and oxytocin had an odds ratio of 48 [10].

Our patient had a history of four uncomplicated spontaneous vaginal deliveries and denied any previous gynecological procedures that would have increased her risk for uterine rupture. During labor, the non-reassuring fetal status and severe abdominal pain led to the decision to proceed immediately to the operating room. At this time, placental abruption was originally thought to be the cause of her symptoms. There was a low suspicion for uterine rupture at the time and it was diagnosed only after her abdomen was entered surgically. Most ruptures occur in the lower uterine segment [11]. However, this patient's rupture was located on the left, lateral wall of the uterus and into the uterine artery, eventually requiring cesarean hysterectomy.

4. Conclusion

Rupture of the unscarred uterus can be a catastrophic event that results in maternal and fetal morbidity and mortality [4]. This was demonstrated in a case-control study comparing the outcomes of 20 cases of unscarred uterine rupture with 120 cases of scarred uterine rupture. The authors discovered that primary uterine rupture cases (those of the unscarred uterus) had a "greater maternal morbidity, greater mean blood loss, a higher rate of blood transfusion, and a higher frequency of peripartum hysterectomy" than rupture of a scarred uterus [12]. Similar to our case, most patients presenting with uterine rupture have non-reassuring fetal status and severe abdominal pain [1,13]. It is imperative to have increased suspicion and distinguish these symptoms from other occurrences in the intrapartum period, such as placental abruption or intrauterine infection. The risk for maternal and neonatal morbidity and mortality is higher in cases involving unscarred uteri because there can be delayed awareness [1,12] of the rupture due to typical labor pains and lack of obvious risk factors [1,12]. Our patient's advanced maternal age, fourth pregnancy, external cephalic version to correct for breech position, and sequential use of misoprostol and oxytocin are all individual factors that could have led to her rupture. Although an exceedingly rare complication, her risk factors compounded each other and resulted in this unfavorable outcome.

This case serves as an educational example of a detrimental outcome in an apparently low-risk situation. Heightened awareness, close supervision, and low threshold for intervention would enable obstetrical teams to achieve a better outcome when presented with a similar situation.

Author's contribution

S.D. Halassy drafted and revised the manuscript.

J. Eastwood performed the literature search and revised the draft manuscript.

J. Prezzato revised the draft manuscript.

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Patient consent

Obtained.

Provenance and peer review

This case report was peer reviewed.

Declaration of Competing Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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