

Uterine rupture in an unscarred uterus detected in the course of postpartum hemorrhage: a case report and review of the literature

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Abstract: Uterine rupture represents a significant and infrequent complication in obstetrics, posing a potential risk to the well-being of both the mother and the fetus when not promptly identified and addressed. The occurrence of spontaneous uterine ruptures is more prevalent in individuals with a history of uterine scarring, whereas instances in unscarred uteri are considerably rarer. In this report, we present an uncommon occurrence involving the spontaneous uterine rupture of an unscarred uterus in a 25-year-old patient, gravida 3 para 3, without a prior history of uterine surgery. The diagnosis was established following postpartum hemorrhage accompanied by severe hypovolemic shock, necessitating management at our maternity facility. Notably, a palpable defect was identified during vaginal examination after the patient's vaginal delivery. Laparotomy confirmed the diagnosis, and despite initial attempts at conservative treatment, a hemostasis hysterectomy became necessary. The postoperative course was uneventful. The etiopathogenesis, clinical features, and therapeutic considerations of spontaneous unscarred uterine ruptures are explored in the context of a comprehensive literature review.

Keywords : Spontaneous uterine rupture, Unscarred uterus, Postpartum hemorrhage, Multiparity, Obstetric emergency.

INTRODUCTION:

Uterine rupture is defined as a complete or partial rupture (with intact visceral peritoneum) of the myometrium, creating a communication between the uterine cavity and the abdominal cavity. Uterine rupture (UR) is one of the most serious obstetric complications that can occur during labor or at the end of pregnancy and contributes significantly to maternal and fetal mortality in developing countries (1).

The main risk factors for uterine rupture include a history of cesarean section or gynecological surgery (myomectomy), uterine malformations, and inappropriate use of uterotonic agents. The majority of cases occur in women in labor with pre-existing risk factors. Among spontaneous uterine ruptures, only 17% occur before the onset of labor (2,3). Nevertheless, its incidence during the first and second trimesters of pregnancy remains low (2). When symptoms appear early in pregnancy, the preoperative diagnosis is often late miscarriage or ectopic pregnancy (3). When ultrasonography is performed, it may either be normal, leaving the diagnosis uncertain, or reveal hemoperitoneum, in which case the differential diagnosis includes obstetric causes or other surgical origins (3).

In view of this real diagnostic challenge, we report a case of uterine rupture at 11 weeks of gestation in a primigravida with a history of myomectomy. After describing our observation, we discuss the etiopathogenesis as well as the clinical and therapeutic aspects of this obstetric emergency through a review of the literature

CASE REPORT:

This is the case of A 25-year-old patient (O.E), with a Gravida of 3 and Para of 3, has a history of three previous vaginal deliveries at full term gestation, all with short birth intervals. The most recent

delivery had occurred just 2 hours before her admission to our maternity ward. She had successfully delivered a healthy male infant scoring 9 at one minute and 10 at five minutes of life on the Apgar scale, with a birth weight of 3,400 grams. The patient was transferred from a peripheral hospital due to postpartum hemorrhage, and it was mentioned that labor and delivery were spontaneous without the administration of oxytocin or misoprostol. Upon admission, the patient presented with hypotension measuring 90/70 mm Hg, tachycardia at 120 beats/min, with conjunctival discoloration, and no fever. The obstetrical examination revealed the absence of a safety globe, with the existence of continued bleeding. Upon manual examination of the uterine cavity, there was suspicion of a solution in the lower segment, indicating a potential uterine continuity issue, prompting suspicion of uterine rupture. Subsequently, the patient was transferred to the operating room for an emergency laparotomy. A blood test showed hypochromic microcytic anemia at 8.9 g/dl. Due to hemodynamic instability, the patient received fluid resuscitation, 3 packed red blood cells, and 3 fresh frozen intraoperatively. During the surgical exploration, a voluminous hemoperitoneum of 1.5L was found in the first place, with the presence of a uterine rupture in the right anterolateral portion of the lower uterine segment, measuring 2cm. This rupture affected the mucosa, musculature, and serosa, while carefully respecting the integrity of the bladder, and without involvement of the uterine pedicle.

Considering the young age and the patient's expressed desire to preserve her fertility, our initial decision was to proceed with uterine reconstruction, but due to the persistence of uterine inertia, we opted for Tsirulnikov triple artery ligation, injection of 50 IU of oxytocin, and 1000ug of misoprostol administered using a rectal route. However, the patient was still unstable,

with hypotension at 08/04 mm hg, a rapid thready pulse at 140 bpm, and no uterine globe. Because of the hemorrhagic shock, we opted for a subtotal hysterectomy for maternal rescue. By the end, the patient was admitted to the Intensive Care Unit (ICU) for thorough hemodynamic monitoring and stayed for 24 hours, receiving antibiotics, and analgesics associated with anticoagulants. The clinical evolution was slightly favorable, and the patient was declared outgoing on day 5 of the postoperative period with effective contraception.

DISCUSSION:

Uterine rupture is a serious obstetric condition characterized by the presence of a partial or complete solution of continuity of a gravid uterus, that is not related to surgery. This rupture encompassed the complete thickness of the uterine wall, extending to the adjacent peritoneal layer (2). As a result, there was direct connection between the uterine lumen and the peritoneal cavity. It is a serious obstetrical condition associated with maternal mortality, primarily due to the high risk of hemorrhagic shock from involvement of large vessels, the uterine pedicle, and the high blood flow in the gravid uterus. In the context of uterine rupture (UR), two distinct types are recognized: traumatic and spontaneous. The etiologies of what are commonly referred to as "traumatic" ruptures can vary, but they are usually caused by obstetric maneuvers (Endo uterine maneuvers, uterine manipulations, or uterine expression). The global incidence of uterine rupture is reported to be 5.3 per 1,000 cases. In developed nations, this obstetric complication affects 3.5 out of every 1,000 women, with a previous cesarean section identified as the primary etiology. The incidence is lower, at 6 per 10,000 pregnant women, for those without a prior record of uterine surgery (4). In contrast, the frequency is significantly more prevalent in developing countries, with an incidence rate of 1 per 100 births. This disparity reflects variations in socioeconomic conditions and levels of medical supervision (5). The consensus among the majority of authors is the acknowledgment of advanced parity is identified as a significant risk factor for spontaneous uterine rupture in a non-scarring uterus. One of the pathophysiological explanations could be myometrial fragility acquired during successive pregnancies (3). However, primigravid parturients are not exempt from spontaneous UR. In a literature review by Walsh and Baxi, a total of 36 instances of spontaneous uterine rupture in primigravida were documented and various factors contributed to uterine rupture. Uterine surgery is the most significant contributor, accounting for 31% of cases, followed by labor at 17%. Congenital uterine anomalies and morbidly adherent placenta (in particular placenta percreta) contribute 14% and 11%, respectively. Both oxytocin use and prostaglandin analogues contribute equally at 11% each. The etiology remains unknown in 5% of cases. Connective tissue disorders and adenomyosis each contribute 3% to the occurrence of primigravid uterine rupture (6). Catanzarite et al. reported a case involving the spontaneous rupture of a non-scarring uterus in a primigravida, with the incident attributed to the excessive use of oxytocics (a continuous increase of oxytocic dose up to 17 mIU/min despite frequency hyperkinesis on tocometry). Protocols for the administration of oxytocics during labor vary according to the authors, but it is

exceptional to have to resort to doses higher than 20 mIU/min, the maximum dose being 30 mIU/min. Spontaneous rupture of a non-scarring uterus has also been reported, to induction of labor (on a live fetus or in case of fetal death in utero) by prostaglandins or their analog (misoprostol) (7). Various additional risk factors for spontaneous UR have been suggested, encompassing abnormal fetal presentation, uterine malformations, placental abnormalities, previous mid-trimester uterine instrumentation, prior molar pregnancy, fetopelvic disproportion, and macrosomia (6). In contrast to the prevailing cases where uterine rupture typically happens in scarred uteri, our patient experienced this complication with an unscarred uterus. Additionally, given the absence of documented oxytocics usage at the primary care center where the delivery occurred, the primary etiologic factor can be attributed to multiparity with short birth intervals. This underscores the significance of careful consideration of unique risk factors in cases deviating from the more common scenarios of uterine rupture.

The symptoms indicating an impending uterine rupture are typically nonspecific, heterogeneous, and shared with uncomplicated labor. Clinically, the semiological tetrad associating acute abdominal pain, signs of shock, metrorrhagia, and the nonreassuring fetal heart rate patterns are classically described but not always found in their entirety (6). The abnormalities of the RCF that precede the UR are essentially late decelerations and bradycardia. In cases of an unscarred uterus, abdominal pain, nonreassuring fetal heart rate patterns, and increased vaginal bleeding—conditions that might prompt a cesarean delivery in women with a scarred uterus—are generally expected to be tolerated with more patience. In our case, after the vaginal delivery in a primary care center, the patient had profuse vaginal bleeding. In the absence of a scarred uterus, the initial efforts were concentrated on investigating the most common causes of postpartum hemorrhage. The patient was initially treated with uterotonics and uterine massage but without improvement. She was then referred to our department for ultimate care. She came with unstable vital signs about 2 hours after delivering, and we intervened immediately. The diagnosis of uterine rupture was suspected by manual revision and confirmed intraoperatively. The patient had no risk factor of uterine rupture besides the multiparity and the short birth intervals. Concerning the location of the rupture, the consensus among many authors, is that ruptures during labor are more commonly situated in the lower segment. In contrast, those happening outside of labor are typically found in the corporal region (8).

The therapeutic approach to uterine rupture (UR) is a medical-surgical emergency, involving initial medical resuscitation followed by surgical exploration through laparotomy. In managing uterine rupture in a healthy uterus, a conservative surgical approach is preferred, especially in young women aspiring to become pregnant. This conservative approach typically involves a straightforward suture of the rupture. However, if a conservative treatment proves impractical due to

the importance and the extent of the lesions, a hysterectomy becomes necessary (3). In this specific case, determining the appropriate therapeutic approach posed a challenge. Initially, conservative treatment was chosen, considering intraoperative findings and the patient's expressed desire to preserve fertility. However, due to the emergence of hemodynamic instability and uterine inertia, a decision was made to proceed with a hemostasis hysterectomy. Miller et al. have previously reported a series of cases involving women who experienced primary uterine rupture, with half of the ruptures being identified during or after the second stage of labor, mirroring the circumstances in our case. Notably, in the Miller et al. series, the rate of hysterectomy was only 10%, differing from our management approach. This may be related to a difference in the location or extent of uterine lesions found in our patient. In a subsequent pregnancy, the likelihood of a recurrent uterine rupture ranges from 4 to 19%, with variations noted in different series. According to most authors, the risk is higher when there is corporal scarring compared to segmental scarring. In such cases, it becomes imperative to establish close monitoring and consider planning a scheduled delivery through prophylactic cesarean section around 38 weeks of gestation (9). Classically, an increased incidence of maternal and fetal morbidity and mortality has been documented in cases where uterine rupture involves unscarred uteri because this complication is unexpected in this population, hence a longer diagnostic delay than in the group of scarred uteri. However, in a research conducted by Ofir et al. to compare uterine rupture in scarred and unscarred uteri, no notable difference was found in terms of maternal and fetal morbidity.

CONCLUSION:

Uterine rupture stands out as a significant concern for obstetricians that has become rare thanks to the clinical and electronic monitoring of labor and prophylactic measures during pregnancy. It happens predominantly on a scarred uterus, while occurrences on an unscarred uterus are exceptional. Unscarred uterus rupture is more frequently observed among older and multiparous women compared to instances of rupture in scarred uteri. While uncommon, healthcare professionals should remain vigilant concerning the potential occurrence related to this complication, independently of the parity or the existence of a previous uterine scar, particularly when there is intense pain and extensive vaginal bleeding during late labor or right after delivery. It is also important to follow the recommendations for the management of postpartum hemorrhage, and conduct manual uterine revision, even when there are no apparent risk factors for uterine rupture.

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