

UTERINE RUPTURE IN A HEALTHY UTERUS DURING THE SECOND TRIMESTER: A
CASE REPORT AND LITERATURE REVIEWFatima Zahra EL Harraz*¹, Brahim Maaloum², Douae Riali¹ and Zaki EL Hanchi¹¹Gynaecology-Obstetrics and Endocrinology Department, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco.²Gynaecology-Obstetrics and Endoscopy Department, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco.

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ABSTRACT

Uterine rupture is a rare and serious obstetric complication with potentially life-threatening consequences for both the mother and the fetus, impacting the obstetrical outcome of the woman and the course of pregnancy in the absence of immediate detection and management. It is more commonly associated with a scarred uterus and exceedingly rare in cases of a healthy uterus. Diagnosis can be challenging, and treatment may be delayed, especially when symptoms are nonspecific. Therefore, maintaining a high level of suspicion is crucial. Once diagnosed, management typically involves prompt surgical intervention. We present a rare case of spontaneous uterine rupture in a 29-year-old patient with no significant medical history, diagnosed at 15 weeks of gestation due to extensive hemoperitoneum following trauma to the abdominal pelvic area. Through this case report and literature review, we highlight the importance of heightened vigilance even in the presence of a healthy uterus, as well as key clinical signs, risk factors, diagnostic methods, and therapeutic approaches to this rare but potentially serious complication.

INTRODUCTION

Uterine rupture poses a life-threatening risk to both the mother and the fetus, with significant implications for the woman's obstetrical outcome and associated high rates of fetal and maternal morbidity and mortality.^[1] It occurs more frequently in the presence of a scarred uterus while remaining exceptionally rare in cases of a healthy uterus.

Once uterine rupture is suspected, prompt exploratory laparotomy is essential, as pregnant patients have an increased tolerance to hemorrhage due to expanded maternal plasma volume. Additionally, clinical signs of bleeding such as tachycardia and hypotension may be absent until approximately 20% of total blood volume is lost.^[2,3]

We present a case of uterine rupture in the early second trimester of a non-evolutionary monofetal pregnancy following trauma to the abdominal-pelvic area in a patient with a healthy uterus.

CASE REPORT

A 29-year-old patient, gravida 4, para 2, with a history of two uneventful vaginal deliveries at term, one spontaneous abortion, and the current pregnancy estimated at 15 weeks of gestation, was referred to our

hospital due to hemorrhagic shock. The patient reported a history of abdominal-pelvic trauma (related to a family conflict) but denied any medication or herbal use.

On admission, the patient was hypotensive (80/50 mm Hg), tachycardic (138 beats/min), pale, and exhibited generalized abdominal guarding. Gynecological examination revealed minimal dark vaginal bleeding of endo-uterine origin, with cervical motion tenderness.

An obstetric ultrasound revealed an empty uterine cavity with a discontinuity at the fundal level, an intra-abdominal fetus corresponding to 15 weeks of gestation without cardiac activity, and extensive intraperitoneal hemorrhage with blood clots filling the Morrison's pouch.

The patient underwent emergency laparotomy, which revealed the intra-abdominal fetus (**Figure 1, Figure 2**), extensive hemoperitoneum (evacuation of 1440 mL of blood), and complete fundal uterine rupture with extrusion of the placenta. (**Figure 3, Figure 4**).

Given the patient's age and desire to preserve fertility, conservative management was chosen, involving uterine reconstruction with two-layer hysterorrhaphy. The patient

received a transfusion of 4 units of packed red blood cells, and the fetus weighed 250 grams.

Postoperative recovery was uneventful, and the patient was discharged on oral contraception and iron supplementation on the seventh postoperative day.



Figure 1: Free intra-abdominal amniotic sac.



Figure 2: Amniotic sac with a fetus without cardiac activity at 15 weeks gestational age.



Figure 3: Figure showing the exit of the placenta through the uterine rupture.



Figure 4: Rupture at the level of the uterine fundus measuring 8 cm in length.

DISCUSSION

Uterine rupture is considered a rare emergency in developed countries, with an incidence of approximately 1 in 2,000 births, whereas it is much more common in developing countries, affecting about 1 in 100 births.^[4] This disparity reflects differences in socio-economic conditions and levels of medical surveillance. Indeed, the lack of qualified personnel and healthcare infrastructure is often cited as the main cause of this disparity.^[5,6]

The incidence of uterine ruptures in the general population ranges from 1 in 1,235 to 1 in 4,366 deliveries, while on a healthy uterus, it is estimated between 1 in 16,840 and 1 in 19,765 deliveries in high-income countries. In published studies, fetal mortality is estimated between 12 and 35%, with a hysterectomy rate of 20 to 30%.^[7-11]

On a non-scarred uterus, the frequency of uterine rupture is estimated between 1 in 17,000 and 1 in 20,000 deliveries.^[12]

Uterine rupture is a complete disruption of the uterine wall and its serosa, with the uterine cavity communicating with the peritoneal cavity. Two types of uterine rupture are distinguished: traumatic and spontaneous. The etiologies of traumatic uterine rupture are varied and can be related to direct or indirect trauma or obstetrical maneuvers (such as endo-uterine maneuvers or uterine expression).^[13,14]

However, the incidence of uterine rupture in the first and second trimesters of pregnancy is rare.^[15] We therefore focus on this type of rupture. Early uterine ruptures, occurring during the second trimester, occur in particular situations such as corneal or interstitial pregnancies, a history of uterine perforation, pregnancies on cesarean scar, etc. However, due to the limited number of cases

reported, it is difficult to establish reliable risk factors.^[16]

The risk factors for uterine rupture in a healthy uterus during pregnancy are varied, among which the main ones include uterine malformations, multiparity, obstetrical maneuvers, instrumental extractions, mechanical dystocia, abnormalities of placentation, a history of uterine curettage, as well as the use of oxytocics.^[17]

In the case of our patient, the only identified risk factor was multiparity, which made this event unexpected and unforeseen.

In some cases, rupture on a gravid, seemingly healthy uterus, has no obvious cause. Schrimsky found ten spontaneous ruptures with no contributing factors in his series of 40 ruptures.^[18] Five cases of rupture, out of the 59 reported by Iloki, had no defined cause.^[19] Parry et al. suggested that risk factors for unexplained uterine rupture may include uterine diverticula, arteriovenous malformations, and endometriosis.^[20,21]

The maternal mortality rate associated with uterine rupture is about 10%, while the fetal mortality rate can reach 100% if the rupture occurs in a traumatic context. Complete uterine rupture occurs when all layers of the uterine wall, including the serosa, are breached. In contrast, incomplete uterine rupture spares the serosa and is primarily detected as uterine dehiscence at the time of cesarean section.^[22,23]

In the literature review, 18 cases of uterine rupture during the second trimester were reported, with the fundus being the most common site. Among the nine fundal ruptures observed, there were two instances of invasive placentation, two cases of adenomyosis, one ruptured cornual pregnancy, a septate uterus, and prior uterine surgery. The posterior wall was the second most

common site, with two out of three cases corresponding to a previous myomectomy scar; in one of these cases, a history of curettage was noted. Other sites of fundal rupture included the uterine horns, the anterior wall, and the lower segment.^[24]

The uniqueness of our case is the occurrence of uterine rupture in the second trimester in a healthy uterus. The only identified risk factor was trauma to the abdominopelvic region, which represents a potential iatrogenic risk for occult uterine rupture.

During the second trimester, as presented here, the symptomatology remains variable. The occurrence of vaginal bleeding would be less frequent, but signs of hemoperitoneum are almost constant.^[25,26]

The clinical signs of uterine rupture in early pregnancy are nonspecific and must be distinguished from acute abdominal emergencies. Abdominal pain, vaginal bleeding, and vomiting are classic manifestations. Differential diagnoses include hemorrhagic corpus luteum, heterotopic pregnancy, and other surgical causes of acute abdomen such as ruptured appendicitis.^[27]

The clinical presentation of uterine rupture is generally evident, characterized by pronounced symptoms such as severe and violent pelvic pain, a sensation of tearing, vaginal bleeding, and hemodynamic instability that can evolve into shock.^[28] Clinically, our patient presented with hemorrhagic shock.

Abdominopelvic ultrasound is primarily used to identify hemoperitoneum, and the diagnosis will ultimately be confirmed intraoperatively during laparotomy.^[29]

The therapeutic management of uterine rupture remains a medical and surgical emergency and includes medical resuscitation followed by exploratory laparotomy.

Surgical treatment of uterine rupture on a healthy uterus should ideally be conservative in young women desiring future pregnancies, consisting of simple suturing of the rupture. In cases where conservative treatment seems impossible due to the extent of the lesions, a hysterectomy is necessary.^[13,30]

In our case, conservative treatment was decided upon based on intraoperative evaluation, hemodynamic stability, and the patient's desire to preserve future fertility.

Regarding the technique of conservative treatment for uterine rupture, some authors, such as Cecchini *et al.*, preferred double-layer sutures³¹, while Perdue *et al.* used single-layer closure.³² No guidelines exist to determine the optimal closure mode related to outcomes in second-trimester uterine rupture. In our case, we performed a two-layer closure.

Our case report is unique as no other case reports were found identifying patients with second-trimester uterine rupture in their subsequent pregnancies to assess outcomes.

In the event of a subsequent pregnancy, the risk of recurrence of uterine rupture ranges from 4 to 19% according to series.¹⁴ Regardless of the gestational age at which the rupture initially occurred, patients with a history of uterine rupture should be counseled on the timing of delivery in subsequent pregnancies before the onset of labor to minimize the risk of recurrence.^[33,34]

This case report highlights the importance of having a high clinical suspicion of uterine rupture, especially in the context of abdominopelvic impact trauma.

CONCLUSION

Uterine rupture on a healthy uterus is a rare but serious event in pregnancy, involving maternal and fetal prognosis. Therefore, clinicians must be aware of this sometimes dramatic and life-threatening condition.

This case report highlights that uterine rupture can occur at any stage of gestation, not just in the third trimester.

Surgical exploration is necessary to confirm the diagnosis and for management. After uterine rupture, patients are advised to avoid pregnancy for at least one year, and subsequent pregnancies should be carefully monitored.

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