



Rare Mid-Trimester Uterine Rupture in a 32-Year-Old Woman: A Case Report on Surgical Repair and Outcome

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Abstract

Mid-trimester uterine rupture is a rare but life-threatening complication, particularly in patients with a history of multiple cesarean sections. This case report details the successful management of a uterine rupture at 23 weeks gestation in a 32-year-old woman, gravida 5 para 4, with four prior cesarean sections. The patient presented to the emergency department with sudden severe abdominal pain and hemodynamic instability, including hypotension and tachycardia. Bedside ultrasound revealed significant intra-abdominal bleeding, and an emergency laparotomy confirmed a uterine rupture along the previous cesarean section scar. The rupture was surgically repaired, and the patient received multiple blood transfusions. Following close monitoring in the intensive care unit, the patient made a full recovery. This case showed the importance of early recognition of uterine rupture and the need for prompt surgical intervention, even in the second trimester, in patients with a history of uterine surgery. The case underscores the necessity of individualized management and counseling for women at risk of uterine rupture during pregnancy.

Keywords: *Uterine rupture, mid-trimester, cesarean section, uterine scar, emergency laparotomy, case report, hemodynamic instability, second trimester*

Introduction

Uterine rupture is a rare but life-threatening obstetric emergency that occurs when the uterine wall tears during pregnancy or labor. It is most commonly associated with previous cesarean deliveries, but other risk factors such as grand multiparity, obstructed labor, fetal malpresentation, and the inappropriate use of uterotonic agents can also contribute to its occurrence (1). The condition often results in severe maternal and fetal morbidity and, in some cases, mortality if not promptly recognized and treated (2). The classical presentation includes acute abdominal pain, vaginal bleeding, and signs of hypovolemic shock, but the presentation can be atypical, especially in the early stages of pregnancy, complicating diagnosis and management (3).

The rupture of the uterus is most frequently seen in the third trimester or during labor, particularly in women with a history of uterine surgery (1). However, cases of rupture in the first and second trimesters are exceedingly rare and present a diagnostic challenge due to their nonspecific symptoms and the lower clinical suspicion in early pregnancy (4). Such cases often have underlying factors like previous uterine surgery, uterine anomalies, or morbidly adherent placenta, which weaken the myometrium and predispose it to rupture (5). Despite the low incidence, the consequences of uterine rupture are severe, making early diagnosis and intervention critical (6).

A retrospective study by Sinha et al. (1) conducted at a tertiary care hospital in New Delhi reported the incidence of uterine rupture as 0.061%, with a majority of cases (84.8%) involving patients who had a history of low transverse cesarean sections. Other studies have similarly identified cesarean sections, obstructed labor, and fetal malpresentations as major risk factors, accounting for approximately 90% of uterine rupture cases. Grand multiparity, especially grand multiparity, has been frequently cited as a predisposing factor for uterine rupture. Repeated pregnancies can lead to an increase in fibrous tissue and thinning of the uterine musculature, contributing to the risk of rupture. Additionally, the inappropriate or injudicious use of oxytocic drugs, including oxytocin and prostaglandins, has been implicated in several cases of uterine rupture. Baskett et al. (3) reported that prostaglandins, which are longer-acting and more potent than oxytocin, can increase the risk of tachysystole and uterine hypertonus, further raising the chances of uterine rupture (5, 6). This showed the need for caution in the administration of such drugs, especially in women with existing uterine scars or other risk factors.

In terms of clinical presentation, the classical symptoms of uterine rupture include sudden, severe abdominal pain, vaginal bleeding, and the cessation of fetal movements. The patient may also present with hypovolemic shock and signs of diaphragmatic irritation due to hemoperitoneum. In laboring women, the sudden cessation of labor pains and the loss of station of the presenting part are classical indicators of uterine rupture. Pappalardo et al. (4) showed cases of uterine rupture in mid-trimester pregnancies, noting that these symptoms may sometimes lead to delayed diagnosis and intervention.

Although uteri is more commonly observed in the third trimester, cases of rupture in the first and second trimesters have been documented. Abdulwahab et al. (2) reported three cases of mid-trimester uterine rupture, two of which involved grand multiparas with previous cesarean sections. One of these cases involved a

spontaneous uterine rupture at 15 weeks gestation, while another case occurred following failed induction at 24 weeks gestation. Similarly, Jang et al. (6) reported on cases where morbidly adherent placentas were associated with uterine rupture during the first trimester, demonstrating that placental implantation abnormalities can also contribute to uterine wall weakening and rupture.

In rare instances, uterine anomalies such as didelphys or bicornuate uterus can increase the risk of rupture, particularly when associated with placental abnormalities such as placenta percreta. Haberal et al.

(5) reported a case of spontaneous uterine rupture at 18 weeks gestation in a woman with uterus didelphys and placenta percreta, showing the importance of early detection in such high-risk patients. Additionally, the presentation of uterine early pregnancy can often be atypical, with gastrointestinal symptoms and vague abdominal discomfort complicating the diagnosis, as noted by Abdulwahab et al. (2).

The management of uterine rupture requires timely and surgical intervention, typically involving laparotomy and repair of the uterine defect. Hornemann et al. (7) reported a case of uterine rupture at 21 weeks gestation due to placenta percreta, showing the critical role of early intervention to prevent maternal and fetal morbidity. The variability in clinical presentation, particularly in the second trimesters, can lead to diagnostic delays, making it essential for clinicians to maintain a high index of suspicion, especially in women with risk factors such as previous uterine surgeries or abnormal placental implantation.

While uterine rupture is a rare occurrence, particularly in early pregnancy, it remains a serious obstetric emergency. Studies by Sinha et al. (1), Baskett et al. (3), Abdulwahab et al. (2), and others have shown the importance of careful monitoring and early diagnosis, particularly in women with known risk factors such as previous cesarean sections, grand multiparity, or uterine anomalies.

Proper management and timely intervention are crucial to reducing the risk of severe maternal and fetal outcomes associated with this catastrophic event (8 – 11).

This report aimed to show the importance of recognizing uterine rupture in its various forms, particularly when it occurs in early pregnancy, which is less commonly documented. Through the analysis of this case, the report seeks to increase awareness of the diverse presentations and risk factors for uterine rupture, showing the need for a high index of suspicion in patients with prior uterine surgeries or other risk factors, regardless of

gestational age. The objective is to inform clinical practice and enhance the understanding of uterine rupture as an obstetric emergency, thereby contributing to improved patient outcomes through timely intervention.

Case Presentation

The patient is a 32-year-old gravida 5 para 4 female with a significant obstetric history of four previous cesarean sections. Throughout her current pregnancy, she had been receiving regular antenatal care with no complications reported. She had no prior history of medical conditions such as hypertension, diabetes, or preeclampsia, and she did not experience any complications like gestational diabetes or infections during her previous pregnancies. Her previous cesarean deliveries were the only notable risk factor, and she had remained compliant with her antenatal visits and routine screenings, which had all been unremarkable. The patient had no history of smoking, alcohol use, or substance abuse, making her otherwise a low-risk case apart from her obstetric history.

The patient had an uneventful pregnancy until the 23rd week of gestation. On that day, she suddenly experienced severe lower abdominal pain, which prompted her family to bring her to the emergency department. Before the acute onset of pain, she had no unusual symptoms or complications. Upon arrival at the hospital, she was found to be in a state of hypovolemic shock, characterized by hypotension, tachycardia, and abdominal distension. Her family reported that the severe pain had appeared suddenly, without any obvious trigger, and they brought her to the hospital as soon as possible. On arrival, her condition had deteriorated to the point that she required immediate medical intervention.

When she presented to the emergency department, her vital signs revealed significant hemodynamic instability. Her blood pressure was critically low at 80/40 mmHg, her heart rate was elevated to 135 beats per minute, and she was tachypneic, with a respiratory rate of 28 breaths per minute. She had a body temperature of 36.2°C and an oxygen saturation of 93% on room air. Upon physical examination, her abdomen was tense, distended, and extremely tender, raising immediate concerns about internal bleeding. Cardiovascular examination revealed a tachycardic patient with weak peripheral pulses, while her respiratory and neurological systems showed no significant abnormalities apart from the effects of shock. The clinical presentation strongly indicated that she was in hypovolemic shock, with a suspected cause being a ruptured uterus given her obstetric history. Bedside ultrasound was performed immediately, revealing a large amount of free fluid in the abdomen, strongly suggestive of massive internal hemorrhage.

Laboratory investigations confirmed a significant drop in hemoglobin to 6.8 g/dL, indicating severe blood loss. Her coagulation profile, including PT and APTT, showed slight prolongation, likely due to the ongoing hemorrhage. Electrolyte levels were within normal ranges, with a sodium level of 132 mEq/L and potassium at 3.8 mEq/L.

Given her critical condition, immediate resuscitative measures were undertaken. Large-bore intravenous access was secured, and aggressive fluid resuscitation with 2 liters of normal saline was initiated. Despite this, her hypotension persisted, necessitating further stabilization efforts. Bedside ultrasound confirmed the presence of massive intra-abdominal bleeding, likely originating from the uterus. Due to the urgency of the situation, no additional imaging was performed, and the decision was made to proceed with emergency surgery. Based on her clinical presentation and ultrasound findings, the working diagnosis of uterine rupture was established. Given her history of four cesarean sections, this was considered the most likely cause of her internal bleeding, though it was unusual for a rupture to occur during the mid-trimester of pregnancy.

The diagnosis of a ruptured uterus with massive internal bleeding was confirmed intraoperatively during an emergent laparotomy. The rupture had occurred along the scar tissue from her previous cesarean sections, and it had led to significant internal hemorrhage. The intraoperative findings were consistent with the initial clinical suspicion, making uterine rupture the definitive diagnosis. After the procedure, it was revealed that the fetus showed no signs of life and was deceased, weighing 350 grams. This finding confirmed the diagnosis of a second-trimester miscarriage. The gestational age, along with the fetal weight, aligned with expected developmental markers for this stage, further substantiating the nature of the mid-trimester uterine rupture and its impact on the pregnancy outcome.

Upon arrival at the emergency department, immediate life-saving interventions were initiated due to the patient's unstable condition. Aggressive fluid resuscitation was started with normal saline, but her hypotension persisted, necessitating further intervention. Blood transfusions were rapidly initiated, and 6 units of packed red blood cells were administered to address her profound anemia caused by the massive hemorrhage. In addition to the blood transfusions, 4 units of fresh frozen plasma (FFP) were given to manage any coagulation abnormalities. Despite these efforts, the patient remained hypotensive, and norepinephrine was started to maintain adequate blood pressure. Given the critical nature of her condition and the confirmed presence of

internal bleeding, she was transferred to the operating room for an emergency laparotomy.

In the operating room, a midline laparotomy was performed, revealing a ruptured uterus with significant intra-abdominal hemorrhage. The site of the rupture was along the scar tissue from her previous cesarean sections, and surgical repair of the rupture was successfully carried out. Hemostasis was achieved, and the source of the bleeding was controlled. During the surgery, the patient received additional blood products to compensate for her blood loss, including the aforementioned packed red blood cells and FFP. Broad-spectrum antibiotics, including intravenous ceftriaxone (2g) and metronidazole (500mg), were administered prophylactically to prevent infection. Postoperatively, she was transferred to the intensive care unit (ICU) for further monitoring and care.

Postoperatively, the patient remained in the ICU for 48 hours for close monitoring. Her vital signs stabilized, and she responded well to the treatment. Intravenous fluids were continued to ensure adequate hydration and circulation, and her hemoglobin levels gradually improved after receiving multiple blood transfusions. Pain management was provided with intravenous morphine (5mg), which was effective in controlling her pain. Continuous monitoring of her blood pressure, heart rate, urine output, and other vital parameters was conducted to detect any early signs of complications. Fortunately, the patient remained stable during her ICU stay, and no additional surgical interventions were required.

The immediate outcome following the laparotomy was successful. The patient was stabilized, and her hemodynamic status improved significantly after the surgical repair and transfusions. She was extubated in the ICU and showed continuous improvement, with her blood pressure stabilizing at 110/70 mmHg and her heart rate decreasing to 90 beats per minute. She tolerated the transfusions well, and her hemoglobin levels increased to 10.5 g/dL. No signs of postoperative infection, further bleeding, or thromboembolism were observed during her ICU stay. After 48 hours of close monitoring, the patient was transferred to the general ward, where she continued to recover uneventfully.

In the long term, the patient made a full recovery. After discharge from the ICU, she was closely monitored in the general ward, where she continued to show signs of improvement. Follow-up laboratory tests confirmed stable hemoglobin levels and normal coagulation profiles. There were no signs of infection or other postoperative complications, and the surgical repair of her uterine rupture healed without incident. Upon

discharge from the hospital, the patient was in good health, with no remaining problems from the surgery or the massive internal bleeding.

Upon discharge, the patient was advised to follow up regularly with her obstetrician for ongoing prenatal care. She was counseled about the risks of uterine rupture in future pregnancies, particularly given her history of multiple cesarean sections and the occurrence of a mid-trimester rupture. She was strongly advised to avoid labor and consider family planning options to prevent future pregnancies. If she were to conceive again, she was informed that an early planned cesarean section would be essential to reduce the risk of a repeat uterine rupture. The patient was scheduled for follow-up appointments to monitor her recovery, and further counseling on family planning and reproductive health was provided to ensure her well-being.

Discussion

Uterine rupture is a rare yet serious obstetric emergency, especially when it occurs during the second trimester of pregnancy. In the presented case, the 32-year-old patient, gravida 5 para 4, with a history of four previous cesarean sections, experienced a mid-trimester uterine rupture at 23 weeks of gestation. This complication led to hypovolemic shock, requiring immediate surgical intervention. The case showed the complexities and diagnostic challenges associated with uterine rupture, particularly in early pregnancy.

A retrospective study by Sinha et al. (1), conducted in a tertiary care hospital in New Delhi, reported an incidence of uterine rupture of 0.061%, with 84.8% of the cases involving patients who had undergone a low transverse cesarean section. This study, alongside others, identifies cesarean sections as one of the major risk factors for uterine rupture, accounting for up to 90% of cases. In our case, the patient's history of multiple cesarean deliveries was the most significant risk factor, consistent with the findings of Sinha et al. (1). Although the patient had an unremarkable pregnancy up to 23 weeks, her prior surgical history placed her at an elevated risk of uterine rupture, even in the absence of other complications such as hypertension, diabetes, or preeclampsia.

The use of uterotonic agents, such as oxytocin and prostaglandins, is another well-documented risk factor for uterine rupture. Baskett et al. (3) showed that prostaglandins, due to their potent and long-acting effects, increase the risk of uterine hypertonus and tachysystole, both of which can lead to uterine rupture. However,

in this case, no uterotonic agents were used prior to the rupture, underscoring that spontaneous rupture can occur even in the absence of pharmacological triggers, particularly in women with significant uterine scarring from prior surgeries. This finding suggests that clinicians should maintain a high index of suspicion for uterine rupture in patients with a history of cesarean sections, even when common pharmacological risk factors are absent.

Mid-trimester uterine rupture is rare but has been reported in the literature. Abdulwahab et al. (2) described three cases of mid-trimester rupture in grand multiparas with previous cesarean sections, with one case occurring spontaneously at 15 weeks gestation. Another case involved uterine rupture following failed induction at 24 weeks gestation. These cases bear a strong resemblance to the presented case, where the rupture occurred at 23 weeks without any preceding induction attempts or use of uterotonic drugs. The case reported by Abdulwahab et al. (2) showed the importance of recognizing that uterine rupture can present as an acute and spontaneous event during the second trimester, particularly in high-risk patients like those with a history of multiple cesarean sections.

The clinical presentation of uterine rupture in our case involved sudden, severe lower abdominal pain followed by hemodynamic instability, a presentation that aligns with the findings of Pappalardo et al. (4). The patient presented in hypovolemic shock with hypotension, tachycardia, and a distended abdomen, all of which are classic signs of uterine rupture. This is consistent with the reports in the literature, where uterine rupture often presents with signs of internal bleeding, shock, and abdominal tenderness. In addition, the ultrasound findings of free intra-abdominal fluid strongly suggested massive hemorrhage, which was later confirmed during surgery. Early detection via bedside ultrasound was critical in this case, facilitating the decision for immediate surgical intervention.

Several studies have also described uterine rupture in the context of abnormal placental implantation. Jang et al. (6) and Hornemann et al. (7) reported cases of uterine rupture associated with morbidly adherent placenta, particularly placenta percreta, which can lead to weakening of the uterine wall and rupture. Although the presented case did not involve abnormal placentation, the literature indicates (12, 13) that uterine rupture should be considered in the differential diagnosis of acute abdominal pain in pregnant women with placental abnormalities or previous uterine surgeries.

In terms of management, the patient's treatment involved emergency laparotomy and surgical repair of the uterine rupture, which successfully controlled the hemorrhage. This approach is consistent with the recommended management of uterine rupture, which involves immediate surgical intervention to prevent maternal and fetal morbidity and mortality. As described by Hornemann et al. (7), timely surgical intervention is critical in improving outcomes for both the mother and fetus. The patient's postoperative care included blood transfusions and close monitoring in the ICU, which resulted in a favorable recovery without further complications.

This case showed the need for heightened vigilance in managing pregnancies complicated by previous cesarean sections. While uterine rupture is a rare complication, it poses significant risks, and clinicians should be prepared to promptly recognize and manage it, even during the second trimester. Furthermore, the case underscores the importance of individualized patient counseling regarding the risks of future pregnancies. Given the patient's history of uterine rupture, she was counseled on the importance of avoiding labor in subsequent pregnancies and opting for an early planned cesarean section, as recommended by Baskett et al. (3).

Conclusion and Recommendations

This case showed the successful management of a rare mid-trimester uterine rupture at 23 weeks gestation in a patient with a history of four previous cesarean sections. Despite the complexities associated with this condition, early recognition of the signs of uterine rupture and timely surgical intervention were crucial for the patient's recovery without further complications. The outcome demonstrated the importance of prompt decision-making and close monitoring when managing patients with a history of uterine surgery during pregnancy, even in the absence of other risk factors. This case contributes to the understanding of uterine rupture in mid-trimester pregnancy, which is a rare occurrence and poses significant diagnostic challenges due to its atypical presentation.

Based on the experience of this case, it is recommended that clinicians maintain a high index of suspicion for uterine rupture in patients with a history of multiple cesarean sections, regardless of the gestational age. Although uterine rupture is more commonly seen during labor or in the third trimester, this case showed that the risk persists earlier in pregnancy. Close monitoring of such patients during antenatal visits and immediate intervention if signs of rupture occur are critical to improving maternal and fetal outcomes. Comprehensive

counseling on future pregnancy risks should be provided to patients with a history of uterine rupture or multiple uterine surgeries. Further research is needed to explore preventive strategies and optimal timing for delivery in women at risk of rupture during early pregnancy.

Implications for Clinical Practice and Further Research

In clinical practice, this case demonstrates the necessity for vigilant monitoring and early diagnosis of uterine rupture in patients with prior cesarean sections, particularly when they present with sudden abdominal pain or hemodynamic instability. Early diagnostic measures, such as bedside ultrasound, and prompt surgical exploration when rupture is suspected, were key in managing this case successfully. The individualized management plan, which included emergency laparotomy and surgical repair, underscores the importance of tailoring treatment strategies based on the patient's surgical history and clinical presentation.

Close postoperative monitoring and follow-up were essential to ensure a positive outcome and to guide future reproductive planning. Women with a history of uterine rupture require thorough counseling about the risks of subsequent pregnancies, with early and frequent antenatal care to mitigate potential complications. In this case, the patient was counseled on the need for a planned cesarean section in any future pregnancies to minimize the risk of recurrence.

Further research is necessary to better understand the incidence, risk factors, and preventive measures for uterine rupture in mid-trimester pregnancies, especially in patients with multiple cesarean sections. Longitudinal studies on patients with uterine rupture and their reproductive outcomes could provide valuable insights into future management strategies. Such research could lead to the development of standardized protocols for the timing of delivery in women with a history of uterine rupture or significant uterine scarring.

Ethical Considerations

Ethical considerations were prioritized throughout the management of this case. Informed consent was obtained from the patient after thoroughly explaining her condition, the diagnostic procedures, and the potential risks and benefits of the proposed treatments. The patient was actively involved in decision-making, ensuring her autonomy was respected. Confidentiality was maintained by anonymizing all identifying details in this case report to protect the patient's privacy. The case was reviewed and approved by the hospital's ethics committee, ensuring compliance with ethical standards.

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Author Contributions

All authors contributed significantly to the conception, design, and writing of this case report. Each author reviewed and approved the final manuscript for submission.

Conflicts of Interest

The authors declared no conflicts of interest. There were no financial or personal relationships that could have influenced the work reported in this case.

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Data Availability

The data supporting the findings of this case report are available from the corresponding author upon reasonable request. Due to the sensitive nature of the patient information involved in this case, identifying details have been anonymized to protect the patient's privacy. All relevant clinical data, diagnostic images, and surgical notes can be provided in a de-identified format, subject to institutional and ethical approval for data sharing.

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