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Case Report

Atypical Presentation of Uterine Rupture at 13 Weeks Gestation Following Misoprostol Therapy: A Case Report and Review of Literature

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Abstract

Uterine rupture in the first trimester is an exceptionally rare but serious complication, particularly in patients with a history of prior uterine surgery. This case report documents the successful management of a uterine rupture at 13 weeks gestation following misoprostol therapy for a missed miscarriage in a 35-year-old woman with a previous cesarean section. The patient, gravida 5 para 4, presented in routine antenatal follow-up with no symptoms, and a routine ultrasound revealed a missed miscarriage. Following the administration of two doses of oral misoprostol, the patient developed severe abdominal pain and hemodynamic instability. Immediate laparotomy confirmed a uterine rupture at the site of the previous cesarean section scar, with significant internal bleeding. The rupture was surgically repaired, and the patient made a full recovery. This case highlights the importance of close monitoring during medical termination of pregnancy in patients with scarred uteri, even in early pregnancy, and underscores the need for prompt surgical intervention in cases of suspected uterine rupture. Further research is required to refine protocols for the safe use of misoprostol in patients with a history of uterine surgery.

Keywords*: Uterine rupture, first trimester, misoprostol, cesarean section, missed miscarriage, uterine scar, early pregnancy, laparotomy, case report.*

Introduction

Uterine rupture is a serious and life-threatening complication that is typically associated with uterine surgeries such as lower segment cesarean sections, classical cesarean sections, hysterotomy, and myomectomy, all of which increase the risk of uterine rupture, particularly in late pregnancy (1). In contrast, the rupture of an unscarred uterus is rare, but it has been documented, especially in multiparous women, those with abnormal placentation, instrumental deliveries, or when labor is induced by misoprostol in the third trimester (2). Early pregnancy failure is common, occurring in approximately 15-20% of known pregnancies (3). In women with previous uterine surgeries, this complication poses an additional challenge, particularly when deciding on the

safest method for termination of the pregnancy.

Termination of early pregnancy failure can be achieved through various methods, including expectant management, surgical evacuation, or medical management (4). However, there is no universally accepted protocol for the termination of early pregnancy failure in women with scarred uteri, and the decision often depends on the individual case and the clinician's judgment. Medical management, particularly the use of prostaglandins such as misoprostol, is highly effective and avoids many of the risks associated with surgical evacuation. However, uterine rupture, while rare, has been reported, especially when misoprostol is used for induction in women with previous uterine surgeries (5).

The pharmacokinetics of misoprostol are influenced by the route of administration. Studies suggest that the sublingual route results in the highest absorption rates and peak concentrations, which may increase the risk of uterine rupture compared to other routes (6). In women with a history of uterine surgery, even low doses of misoprostol have been implicated in uterine rupture, as demonstrated in a case reported by Kim et al. (7). In their case, a woman with a prior cesarean section experienced uterine rupture after the administration of oral misoprostol in the first trimester. This case is notable because uterine rupture in the first trimester is exceedingly rare, and the dose of misoprostol used was low.

While the largest case series on misoprostol use in women with prior uterine surgery shows that its use is generally safe, with similar success and complication rates to women without uterine surgery, rare cases of uterine rupture have been documented (8). For instance, Jwarah and Greenhalf (9) reported a case of uterine rupture after the administration of 800 micrograms of vaginal misoprostol for the termination of pregnancy. Additionally, Matsuo et al. (10) reported a case of spontaneous uterine rupture in the first trimester at the site of a previous cesarean section, without the use of oxytocics.

The literature indicated that the risk of uterine rupture following the use of vaginal misoprostol (25-50 µg) in women with previous cesarean sections is approximately 6.2%, according to studies by Ophir et al. (11) and Al-Zirqi et al. (12). However, a 2014 Cochrane review by Alfirevic et al. found no cases of uterine rupture among 158 women with scarred uteri who received oral misoprostol for induction (13). These findings highlight the variability in reported cases of uterine rupture, particularly in the first trimester, and the potential risks associated with the use of misoprostol in women with previous uterine surgeries.

Prompt surgical intervention is crucial in cases of uterine rupture, as delay in treatment can result in significant maternal morbidity and mortality. Immediate laparotomy is the standard approach for managing uterine rupture, allowing for the repair of the uterine defect and control of hemorrhage (14). Following surgical repair, it is recommended that women use contraception for at least one year to allow for adequate uterine healing

before attempting another pregnancy. In future pregnancies, close monitoring is essential, particularly for those with a history of uterine rupture, as they are at higher risk for recurrence (14).

Known risk factors for uterine rupture include the type of uterine scar, the dose, and the route of administration of misoprostol or other oxytocics, and these must be carefully considered when selecting patients for medical termination of early pregnancy failure (15 – 16). The case reports in the literature underscore the need for further research into the safe use of misoprostol in women with scarred uteri, particularly in the first trimester. This is essential to better understand the relationship between misoprostol dosage, route of administration, and the risk of uterine rupture in this population.

The aim of this case report is to document the successful management of uterine rupture in the first trimester following the administration of misoprostol for missed miscarriage in a patient with a previous cesarean section. Given the rarity of uterine rupture at such an early gestational stage, this report adds valuable knowledge to the existing literature, showing the importance of close monitoring and individualized management strategies when using misoprostol in women with a scarred uterus.

This case report is expected to contribute to the medical literature by providing a detailed account of a rare and complex clinical scenario, highlighting the diagnostic challenges and the need for heightened clinical suspicion in similar cases. It showed the importance of vigilant monitoring during medical termination of early pregnancy, particularly in patients with previous uterine surgeries. Additionally, the report offers insights into prompt surgical intervention and management strategies that could be employed in future cases. Moreover, the report aims to improve clinical practices and outcomes for patients with scarred uteri undergoing early pregnancy termination due to miscarriage.

Case Presentation

The patient, a 35-year-old gravida 5 para 4 woman with a history of one previous cesarean section, had no notable comorbidities or chronic illnesses. Her prior pregnancies had been largely uneventful, apart from the cesarean delivery. At 13 weeks gestation, the patient presented for routine antenatal care (ANC). During the visit, an antenatal ultrasound was performed, revealing a missed miscarriage. Notably, the patient had no complaints or symptoms at the time of her presentation.

She reported no history of vaginal bleeding, abdominal pain, or other concerning symptoms before this finding. After thorough consultation, it was initially decided to wait for spontaneous expulsion of the fetus. However, when this did not occur, medical management was initiated to terminate the pregnancy, which is a standard

approach in such cases.

Following the confirmation of the missed miscarriage, the patient was scheduled for medical management with misoprostol (Cytotec), 200 microgram sublingual, every six hours to induce the expulsion of the nonviable fetus. She received the first two doses of misoprostol without issue. However, approximately one hour after the second dose, she began experiencing sudden and severe lower abdominal pain. This pain was persistent and gradually intensified, though she reported no vaginal bleeding or other immediate symptoms.

Upon initial examination, the patient's vital signs were stable. Her heart rate was 85 beats per minute, blood pressure was 120/80 mmHg, respiratory rate was 16 breaths per minute, and her oxygen saturation was 98% on room air. Her temperature was within normal limits at 36.8°C. An abdominal examination revealed no tenderness or distension, and her cervix remained closed, with no evidence of vaginal bleeding.

Thirty minutes after the initial examination, the patient's condition deteriorated rapidly. Her heart rate increased to 120 beats per minute, and her blood pressure dropped to 90/60 mmHg, indicating hypotension. She developed a tense and rigid abdomen with generalized tenderness upon palpation, indicating potential internal pathology. These signs raised concerns about a possible uterine rupture, particularly given her history of a previous cesarean section.

In light of the sudden deterioration in her clinical condition, urgent diagnostic tests were initiated. A complete blood count (CBC) revealed a significant drop in hemoglobin from 12.5 g/dL to 9.5 g/dL, indicating acute blood loss, and her hematocrit had fallen to 28%, down from 37%. A repeat abdominal ultrasound showed the presence of free fluid in the abdomen, suggestive of hemoperitoneum. The fetus and placenta remained intact, and there was no evidence of expulsion. Serum electrolytes were within normal limits, and beta-hCG levels remained elevated, consistent with an ongoing pregnancy.

Based on the clinical findings, laboratory results, and imaging, the final diagnosis was uterine rupture with associated internal hemorrhage. This was confirmed during an emergency laparotomy, which revealed a complete rupture of the uterine wall, along with hemoperitoneum. This rupture, though rare in the first trimester, occurred at the site of the previous cesarean scar and resulted in significant internal bleeding. The diagnosis of uterine rupture was unexpected, given the early gestational age of 13 weeks, as this complication is typically associated with later stages of pregnancy or labor.

Following the sudden deterioration of the patient's condition and the suspicion of uterine rupture, immediate intervention was required. Given her history of a previous cesarean section, severe abdominal pain, and signs of hemodynamic instability (elevated heart rate and low blood pressure), an emergency laparotomy was

deemed necessary to explore the cause of her symptoms and prevent further complications.

The patient had initially been placed on a medical management protocol for her missed miscarriage, with misoprostol (Cytotec) being administered at 6-hour intervals. She received two doses of misoprostol, with the expectation that expulsion would occur naturally. However, following the second dose, she developed severe abdominal pain and signs of potential uterine rupture, a rare but serious complication during medical management in women with prior cesarean sections.

Due to the sudden onset of symptoms and concerns about uterine rupture, misoprostol administration was discontinued. The rapid progression of the patient's condition necessitated immediate surgical intervention.

Given the suspicion of uterine rupture, the patient was taken directly to the operating room for an emergency exploratory laparotomy. During the procedure, a complete rupture of the uterus was identified corresponding to the location of the previous cesarean section scar. Active internal bleeding was present, consistent with hemoperitoneum, and significant blood loss was confirmed.

The ruptured uterus was repaired surgically. The patient received a blood transfusion to compensate for the acute blood loss, as her hemoglobin had dropped significantly from 12.5 g/dL to 9.5 g/dL. Hemostasis was successfully achieved, and the peritoneal cavity was thoroughly irrigated to remove any remaining blood clots and fluid.

Postoperatively, the patient was transferred to the intensive care unit (ICU) for close monitoring of her hemodynamic status and recovery. She remained vitally stable after the surgery, with improvements in blood pressure and heart rate. The tense abdomen resolved, and no further complications related to the rupture were noted. Her hemoglobin levels improved after the transfusion, and she did not require additional blood products.

The patient was closely monitored for any signs of infection, wound dehiscence, or other complications typically associated with uterine rupture and emergency surgery. Given the elevated risk of postoperative infection following major abdominal surgery, prophylactic antibiotics were initiated immediately after surgery. The antibiotic regimen included intravenous cefazolin at a dosage of 1 gram every 8 hours for the first 48 hours, which is standard for preventing surgical site infections. Following this, she was transitioned to oral amoxicillin-clavulanate, dosed at 875/125 mg every 12 hours for an additional week to provide extended coverage.

In terms of pain management, a multimodal approach was employed to ensure the patient's comfort while minimizing opioid use. Intravenous morphine was administered at a dose of 2-4 mg every 4 hours as needed for severe pain during the initial postoperative period. Additionally, acetaminophen 1,000 mg was given every

6 hours to manage mild to moderate pain, which helped reduce reliance on narcotics.

The decision to perform an emergency laparotomy was based on the rapid deterioration of the patient's condition, the clinical signs of uterine rupture, and the history of a prior cesarean section. Uterine rupture, while rare in early pregnancy, can be life-threatening if not managed promptly. Given the high suspicion of rupture and the presence of free fluid in the abdomen on ultrasound, immediate surgical intervention was the best course of action to save the patient's life and prevent further complications.

Although uterine rupture at 13 weeks is extremely uncommon, the prior cesarean scar placed the patient at higher risk, and her symptoms warranted prompt action. Deviating from standard care by immediately discontinuing the misoprostol regimen and proceeding with surgery was necessary given the patient's condition. This case showed the importance of recognizing early signs of complications, even when they fall outside typical expectations, and taking decisive action when the patient's stability is compromised.

The immediate outcome of the surgical intervention was favorable. Following the emergency laparotomy and successful repair of the ruptured uterus, the patient exhibited significant improvements in her clinical status. Postoperatively, she was monitored closely in the intensive care unit (ICU) for 48 hours, where her vital signs stabilized. Her heart rate returned to normal levels, and her blood pressure improved to 110/70 mmHg after receiving blood transfusions. Pain management was effectively managed, and she showed no signs of complications such as infection or additional bleeding.

Within a few days, the patient was transferred to the general ward, where she continued to recover. She was able to tolerate oral intake and gradually resumed normal activities. The surgical site healed well, with no evidence of wound dehiscence or infection. Follow-up laboratory tests indicated a gradual increase in hemoglobin levels, which returned to her baseline of 12.5 g/dL by the time of discharge.

At the follow-up appointment approximately six weeks post-surgery, the patient reported feeling well with no ongoing symptoms. A physical examination revealed that her abdominal scar was healing appropriately, and she had resumed her regular activities without restrictions. Her menstrual cycle returned to normal within a few weeks, and she expressed a desire to pursue future pregnancies, fully aware of the increased risks associated with her previous cesarean section and subsequent rupture.

In subsequent visits, the patient underwent counseling regarding family planning and the potential risks associated with future pregnancies, particularly considering her history of uterine rupture. She was advised to seek early prenatal care in future pregnancies and to discuss her obstetric history with her healthcare provider

to ensure a tailored management plan.

As of the latest follow-up, there have been no reported recurrences of complications related to her prior uterine rupture. The patient has not required any additional surgical interventions or medical treatments related to her previous obstetric history. The resolution of her immediate post-operative concerns was complete, and her reproductive health has been restored.

Regular follow-up appointments have been scheduled to ensure continued health and to provide ongoing support and guidance for her reproductive plans. The patient is now considered stable, and no further interventions are planned at this time, barring any future obstetric complications.

Discussion

Uterine rupture is a rare but serious complication, particularly in the context of early pregnancy and the use of misoprostol for medical termination. In this case, a 35-year-old woman with a prior cesarean section presented at 13 weeks gestation with no symptoms, and a routine ultrasound revealed a missed miscarriage. Following the decision to proceed with medical management using misoprostol, the patient developed a uterine rupture, a complication more typically associated with later gestation or labor induction, particularly in scarred uteri.

Several studies have documented the increased risk of uterine rupture in women with a history of uterine surgeries, such as lower segment cesarean sections, classical cesarean sections, or myomectomies. Turner (1) highlighted that such procedures elevate the risk of uterine rupture, even in early pregnancy. However, the rupture of an unscarred uterus is rare, usually occurring in multiparous women or in cases of abnormal placentation, instrumental deliveries, or labor induction with misoprostol, particularly in the third trimester (2). The present case of uterine rupture at 13 weeks gestation is particularly unusual, given that the rupture occurred in the first trimester after the administration of misoprostol at a relatively low dose, which contradicts the typical clinical presentation of this complication.

In general, early pregnancy failure is common, affecting 15-20% of known pregnancies (3). The challenge in cases involving women with previous uterine surgeries is the safe termination of early pregnancy failure. Management can include expectant, surgical, or medical approaches (4). However, there is no universally accepted protocol for the termination of pregnancy in women with scarred uteri, making individualized clinical judgment essential. In this case, medical management with misoprostol was chosen, which is considered highly effective in most cases and helps avoid complications associated with surgical evacuation (5).

The pharmacokinetics of misoprostol play a significant role in its effectiveness and associated risks. According

to the Canadian Pharmacists Association (6), the sublingual route results in the highest absorption rates and peak concentrations, which may increase the risk of uterine rupture compared to other routes. However, in the present case, misoprostol was administered orally. Despite this, the patient still experienced uterine rupture, underscoring the heightened vulnerability in patients with prior cesarean sections. This is supported by findings from Kim et al. (7), who reported a case of uterine rupture after oral misoprostol administration in the first trimester, similarly noting that the dose was low, yet complications still occurred.

While the largest case series on misoprostol use in women with prior uterine surgery indicates that the drug is generally safe, with similar success and complication rates to women without uterine surgery (8), rare instances of uterine rupture have been documented. For example, Jwarah and Greenhalf (9) reported a case of uterine rupture after the administration of 800 micrograms of vaginal misoprostol for pregnancy termination. Additionally, Matsuo et al. (10) described a case of spontaneous uterine rupture in the first trimester at the site of a previous cesarean section, though no oxytocic drugs were used. These reports align with the current case, in which a uterine rupture occurred at 13 weeks following a low dose of oral misoprostol, highlighting the potential risks even in early gestation.

The literature also indicates variability in the risk of uterine rupture based on the route and dose of misoprostol. Ophir et al. (12) and Al-Zirqi et al. (12) reported that the risk of uterine rupture following vaginal misoprostol (25-50 µg) in women with previous cesarean sections was approximately 6.2%. However, a 2014 Cochrane review by Alfirevic et al. found no cases of uterine rupture among 158 women with scarred uteri who received oral misoprostol for induction (Alfirevic et al., 2014). These findings highlight the variability in reported cases of uterine rupture and suggest that more research is needed to determine the safest protocols for misoprostol use, particularly in women with previous uterine surgeries.

Prompt surgical intervention is essential in cases of uterine rupture, as delays can lead to significant maternal morbidity and mortality. In the current case, immediate laparotomy revealed a complete uterine rupture at the site of the previous cesarean scar, along with hemoperitoneum, consistent with significant internal bleeding. This aligns with the findings of Singh et al. (2013), who showed the importance of timely surgical repair and recommended contraceptive use for at least one year after uterine rupture to allow for adequate healing. In subsequent pregnancies, women with a history of uterine rupture should be closely monitored, as they are at increased risk for recurrence (Singh et al., 2013).

In conclusion, this case underscores the importance of vigilance in managing early pregnancy failure in women with scarred uteri. While misoprostol is generally considered safe, even in patients with previous uterine

surgeries, rare complications like uterine rupture can still occur, particularly in early pregnancy. The findings from this case, in conjunction with the literature, highlight the need for further research into the safe use of misoprostol, particularly with respect to dosage and route of administration, in women with scarred uteri.

Conclusion and Recommendations

This case highlighted the successful management of a rare uterine rupture at 13 weeks gestation following misoprostol therapy in a patient with a previous cesarean section. Despite the complexities associated with this condition, early recognition of the signs of uterine rupture and timely surgical intervention allowed for the patient's recovery without further complications. The outcome demonstrated the importance of close monitoring and prompt decision-making when managing patients with a history of uterine surgery undergoing medical termination of pregnancy. This case contributed to the understanding of the risks associated with misoprostol use in scarred uteri, particularly in early pregnancy.

Based on the experience of this case, it is recommended that misoprostol should be used with caution in patients with a history of uterine surgery, even in the first trimester of pregnancy. The risk of uterine rupture, although rare, remains a serious complication that can occur even with low doses of misoprostol. Clinicians should closely monitor these patients during medical termination and be prepared to intervene surgically if signs of uterine rupture arise. This case highlights the importance of individualized risk assessment and the need for alternative management strategies, such as surgical evacuation, in women with significant uterine scarring. Further research is needed to establish clearer guidelines and protocols for the safe use of misoprostol in early pregnancy, particularly in patients with prior cesarean sections or other uterine surgeries.

Implications for Clinical Practice and Further Research

In clinical practice, this case showed the importance of vigilant monitoring when administering misoprostol to patients with a previous cesarean section, even in the first trimester. Clinicians needed to maintain a high index of suspicion for uterine rupture in such patients, especially when they presented with sudden abdominal pain, regardless of the gestational age. A comprehensive diagnostic workup, including detailed ultrasound and prompt surgical exploration when indicated, was crucial for early detection and management of complications like uterine rupture.

The individualized management plan in this case, which included emergency laparotomy and surgical repair, underscored the need for tailored 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. Patients with a history of uterine rupture required thorough counseling regarding the risks of future pregnancies, with early and frequent antenatal care to mitigate potential complications.

Further research was necessary to better understand the incidence and risk factors for uterine rupture in early pregnancy, particularly in women with scarred uteri receiving misoprostol. Investigating the relationship between misoprostol dosage, route of administration, and uterine rupture risk could lead to safer management protocols for pregnancy termination in this patient population. Longitudinal studies on patients with uterine rupture and their long-term reproductive outcomes could provide valuable insights into future management strategies.

This case contributed to the growing body of literature on the complications of misoprostol use in women with prior uterine surgeries and underscored the need for continued clinical vigilance and research to improve the safety and outcomes of such patients.

Ethical Considerations

Ethical considerations were prioritized throughout the management of this case. Informed consent had been obtained from the patient after a thorough explanation of the condition, diagnostic procedures, and the potential risks and benefits of the proposed treatments. The patient was actively involved in decision-making regarding her care, 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. The contributions of the healthcare team, whose expertise and compassionate care were integral to the successful management of this complex case, were acknowledged.

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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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