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Case Report

Failed methotrexate therapy in a cesarean scar ectopic pregnancy: a case report

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ABSTRACT

Cesarean scar ectopic pregnancy (CSEP) is a rare and potentially life-threatening early pregnancy complication associated with prior cesarean section scars, where early detection and treatment are critical to reducing maternal morbidity. Methotrexate (MTX) therapy is a standard conservative approach, but may fail in some instances. We report a case of a 29-year-old woman (gravida 5, para 4) who presented at seven weeks' gestation with mild vaginal bleeding. Transvaginal ultrasound (TVUS) confirmed a non-viable CSEP, and ultrasound-guided intra-sac MTX injection was attempted as conservative management. Despite treatment, the patient developed worsening haemorrhage requiring emergency surgical intervention. Intraoperative findings revealed significant vascularity at the implantation site, and surgical excision of the ectopic pregnancy was performed with preservation of the uterus. The postoperative course was uneventful. This case highlights the limitations of MTX in treating CSEP. It emphasizes the importance of early recognition of treatment failure and prompt surgical management to prevent severe maternal morbidity and preserve reproductive potential.

Keywords: Cesarean scar ectopic pregnancy, Methotrexate failure, Conservative treatment, Surgical management, Obstetric haemorrhage, Fertility preservation

INTRODUCTION

Cesarean scar ectopic pregnancy (CSEP) is a rare but dangerous type of ectopic pregnancy that occurs when a blastocyst implants within the fibrous tissue of a previous cesarean section scar. Although it accounts for less than 1% of all ectopic pregnancies, its incidence is increasing due to the global rise in cesarean delivery rates.[1,2] The condition poses serious risks, including uterine rupture, massive haemorrhage, and significant maternal morbidity. If not diagnosed early, CSEP may progress to a morbidly adherent placenta or cause catastrophic bleeding in the first trimester.[3,4]

Diagnosis of CSEP is primarily achieved through TVUS, which is considered the gold standard for diagnosis. Characteristic sonographic findings include an empty uterine cavity, a gestational sac located in the lower anterior uterine wall at the level of the cesarean scar, a thin or absent myometrial layer between the sac and the bladder, and high vascularity surrounding the sac on colour Doppler imaging.[4,5] CSEP is classified into two types: Type 1 (endogenic), where the pregnancy grows toward the uterine cavity, and type 2 (exogenic), where it extends outward toward the serosal surface. Type 2 is associated with a higher risk due to the potential for early uterine rupture.[6]

Treatment options for CSEP include systemic or local MTX administration, surgical treatment through open laparotomy, and, in some cases, uterine artery embolization. Therapy selection depends on gestational

age, sac size, embryonic viability, and the patient's hemodynamic status. While MTX is widely accepted in non-viable early CSEP, it may fail, particularly in cases with extensive vascularity or deep scar invasion.[7] This case highlights the importance of individualized management in CSEP, illustrating how early conservative treatment with MTX may not always succeed and how timely surgical intervention can be life-saving.

CASE REPORT

A 29-year-old woman, gravida 5 para 4, presented at approximately 7 weeks of gestation with mild vaginal spotting. She had a history of four prior lower uterine segment cesarean deliveries.

The first cesarean section was performed for fetal distress, while the second was elective after she declined a trial of labour after cesarean (TOLAC).

The third and fourth cesarean sections were elective repeat procedures, with the most recent delivery occurring one year before the current pregnancy. She had no history of miscarriage or other uterine surgery, and her medical history was unremarkable, with no significant comorbidities or lifestyle-related risk factors.

On initial evaluation in the emergency department, the patient was hemodynamically stable. Physical examination revealed no abdominal tenderness, no peritoneal signs, and no uterine tenderness. Light vaginal bleeding was noted without abdominal distension.

Diagnostic assessment

TVUS images are shown in Figure 1 A-B, demonstrating a gestational sac implanted in the lower anterior uterine segment at the prior cesarean-scar niche.

A TVUS revealed hallmark features consistent with a CSEP: an empty uterine cavity and cervical canal, a gestational sac implanted in the anterior lower uterine segment at the site of the previous cesarean scar, a thin myometrial layer (<3 mm) between the gestational sac and the urinary bladder, no fetal pole or cardiac activity within the sac, and increased peri trophoblastic vascularity surrounding the sac on colour Doppler imaging.

These findings met the established diagnostic criteria for CSEP.[4,5] The absence of embryonic cardiac activity confirmed the pregnancy was non-viable. Laboratory testing showed a serum β-hCG level of 900 mIU/mL, consistent with early pregnancy. The primary differential diagnoses considered included cervical ectopic pregnancy and impending miscarriage. However, the precise location of the gestational sac in the anterior uterine wall scar, combined with Doppler findings, confirmed the diagnosis and prevented inappropriate interventions such as dilation and curettage, which could have caused uterine rupture.

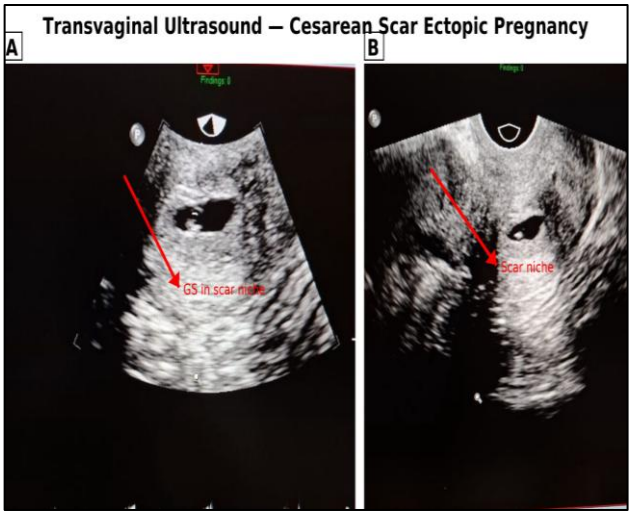

Figure 1: TVUS of a cesarean-scar ectopic pregnancy. (A) Initial scan showing a gestational sac within the cesarean-scar niche (arrow); residual myometrium between sac and bladder is thin (<3 mm). (B) Follow-up view highlighting the scar niche.

Colour Doppler (not shown) demonstrated increased peritrophoblastic vascularity.

Management and clinical course

Given the absence of fetal cardiac activity and the patient's desire to preserve fertility, a conservative approach was selected as the first-line therapy. Under ultrasound guidance, 25 mg of MTX, calculated according to body surface area, was injected directly into the gestational sac to achieve a high local drug concentration. She was admitted for observation; however, over the subsequent days, vaginal bleeding persisted and progressively worsened, indicating treatment failure.

Approximately one week after MTX administration, an emergency laparotomy was performed under general anaesthesia. Intraoperative findings revealed a gestational sac adherent to the lower uterine segment at the previous cesarean scar site, no evidence of uterine rupture, and significant abnormal vascularity at the implantation site. Wedge resection of the ectopic pregnancy and surrounding scar tissue was performed, followed by two-layer repair of the uterine defect to restore integrity and achieve hemostasis. Intraoperative blood loss required transfusion of 3 units of packed red blood cells and four units of fresh frozen plasma. The patient's hemodynamic status stabilized after transfusion, and the uterus was preserved.

Outcome and follow-up

The postoperative course was uneventful. She mobilized without difficulty, and no further bleeding occurred. She was discharged on postoperative day 5 in stable condition. Before discharge, she received counselling on recovery and future reproductive health, including the recommendation to avoid pregnancy for 6-12 months to

allow complete uterine scar healing. She was informed about increased risks in future pregnancies, such as recurrent CSEP and placenta accreta spectrum disorders, and advised to seek early prenatal care with a first-trimester TVUS to confirm implantation site.

At follow-up visits, serial β-hCG monitoring confirmed resolution of the pregnancy. She expressed understanding of the future pregnancy plan and commitment to adhering to follow-up advice.

DISCUSSION

CSEP is a rare but serious complication of early pregnancy, and its management can be particularly challenging. This condition carries significant risks, including uterine rupture, severe haemorrhage, and loss of fertility if not identified and treated appropriately.[2] The present case illustrates several important considerations in managing CSEP, especially when initial conservative treatment fails.

Limitations of MTX therapy

MTX is widely used in the conservative treatment of non-viable ectopic pregnancies, including many CSEP cases. It can be administered systemically or locally via ultrasound-guided injection into the gestational sac. Local injection provides a high concentration of the drug at the implantation site and may reduce systemic side effects.[7]

However, MTX therapy has known limitations in the context of CSEP. Studies report that treatment failure occurs in approximately 17% to 40% of CSEP cases managed with MTX, particularly when there is significant trophoblastic invasion, extensive vascularisation, or poor scar integrity.[8] In our patient, despite the absence of fetal cardiac activity-a factor that generally predicts higher MTX success-locally administered MTX failed to ablate the ectopic tissue completely, and the patient's bleeding worsened, necessitating surgical intervention.

MTX tends to be most effective when the gestational sac is small, β-hCG levels are low, and there is no embryonic cardiac activity.[6] In this case, persistent and worsening haemorrhage likely indicated ongoing trophoblastic viability and perfusion at the scar site despite MTX, underscoring that even a non-viable CSEP can continue to pose a threat if placental tissue remains active.

Surgical management as a life-saving approach

When medical therapy fails or is contraindicated, surgical management becomes essential in CSEP. Available surgical options include dilation and curettage (often combined with uterine artery embolization), hysteroscopic or laparoscopic excision, or open laparotomy. The appropriate choice depends on the patient's haemodynamic status, the availability of interventional radiology and surgical expertise, and the extent of implantation.[9]

In this case, laparotomy was chosen due to worsening haemorrhage and the urgent need for definitive control of bleeding, particularly in a setting lacking access to embolization. Although minimally invasive approaches (laparoscopy or hysteroscopy) are preferred for faster recovery and lower morbidity, open laparotomy remains the safest option when rapid access is required or the patient is unstable.[10] Our case illustrates that timely escalation to surgical management can be life-saving when conservative approaches fail.

Uterine preservation and fertility counselling

For women of reproductive age, preserving the uterus is a key consideration in managing CSEP. In this case, surgical excision of the scar ectopic pregnancy was achieved without hysterectomy, and the uterine defect was successfully repaired. Such uterus-preserving surgeries have shown favourable reproductive outcomes when haemostasis is achieved and the uterine wall is adequately reconstructed.[1]

Nevertheless, patients should be counselled about the elevated risks in subsequent pregnancies, including recurrence of CSEP, placenta accreta spectrum disorders, and potential uterine rupture due to scar fragility.[12] Current guidelines recommend waiting at least 6 to 12 months before attempting conception to allow complete healing of the uterine scar. Furthermore, early prenatal care, including a first-trimester ultrasound, is essential in future pregnancies to confirm proper implantation.[13] The patient in this case was thoroughly counselled on these risks and precautions and demonstrated a clear understanding of the plan for future reproductive care.

The role of early diagnosis

Early and accurate diagnosis is critical in CSEP to optimize outcomes. If a CSEP is misdiagnosed as a spontaneous abortion or cervical pregnancy, inappropriate interventions may be undertaken. For instance, performing blind dilation and curettage in an undiagnosed CSEP can result in uterine rupture and catastrophic haemorrhage.

In this case, the classic ultrasound features of CSEP were identified at initial presentation, allowing the care team to implement an appropriate management plan promptly. Adhering to standard diagnostic criteria on TVUS-including an empty uterine cavity, a gestational sac implanted in the anterior lower uterine segment, a thin residual myometrial layer between the sac and bladder, and increased peri-sac vascularity-is essential to distinguish CSEP from other conditions such as cervical ectopic pregnancy or low intrauterine implantation.[4,5]

This case underscores the importance of maintaining a high index of suspicion in patients with risk factors (e.g.,

multiple prior cesarean deliveries) presenting with early pregnancy bleeding. Prompt ultrasound evaluation can facilitate early diagnosis, prevent inappropriate procedures, and reduce the risk of severe maternal complications.

Multidisciplinary management

Optimal management of CSEP often requires a multidisciplinary approach. The involvement of obstetricians, radiologists, anaesthesiologists, and interventional radiologists (if available) is significant in complex cases or when attempting fertility-preserving interventions.

A coordinated team can effectively plan sequential management strategies-for example, combining MTX therapy with uterine artery embolization, or ensuring surgical readiness with appropriate blood transfusion support.[15] In the current case, the obstetrics and gynaecology team collaborated closely with the surgical and transfusion teams. Effective management of care requires comprehensive services. It is strongly recommended that multidisciplinary input be included in CSEP management to facilitate personalised treatment planning and ensure a quick response to potential complications.

Key learning points include: Early diagnosis with TVUS is critical to ensuring appropriate management and avoiding catastrophic outcomes in CSEP. MTX therapy, although effective in selected cases, may be insufficient in the presence of significant vascularity or deep implantation, even when the pregnancy is non-viable. Prompt surgical intervention (often via laparotomy) remains a life-saving and uterus-preserving option when conservative treatment fails or the patient is unstable. Future fertility considerations must be addressed, with thorough preconception counselling and early pregnancy ultrasound in subsequent pregnancies to monitor for recurrent scar implantation or placenta accreta spectrum disorders. Ultimately, individualized care and early escalation of treatment are paramount in preventing severe maternal morbidity and preserving reproductive potential in patients with CSEP.

CONCLUSION

This case highlights the challenges associated with managing a cesarean scar ectopic pregnancy, particularly when conservative MTX therapy fails. In our patient, despite the absence of fetal cardiac activity and the administration of a localized intra-sac MTX injection, she developed a worsening haemorrhage that necessitated an emergency laparotomy and surgical excision of the ectopic tissue.

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APPENDIX

Table 2 below summarises key specific details from the case, as extracted from the patient's history and clinical course:

Table 1: Summary of key clinical data.

Details	Information
Patient demographics	29-year-old female; gravida 5, para 4 (four previous live births via cesarean)
Obstetric history	Four prior lower-segment cesarean deliveries (no vaginal deliveries, no miscarriages); the last cesarean was 1 year before this pregnancy
Presentation	~7 weeks' gestation with mild vaginal bleeding; patient hemodynamically stable
Ultrasound findings	Empty uterus; gestational sac implanted in anterior lower uterine segment scar; no fetal heartbeat; myometrial thickness <3 mm; increased vascular flow on Doppler
Initial management	Ultrasound-guided intra-sac MTX injection (25 mg, calculated based on body surface area)
Outcome of MTX	Persistent vaginal bleeding over 1-week post-injection, indicating treatment failure
Surgical intervention	Emergency laparotomy with wedge resection of ectopic pregnancy and two-layer uterine repair (uterus preserved)
Intraoperative findings	The sac is firmly adherent to the cesarean scar site, and there is no uterine rupture or significant vascularity at the implantation site.
Blood loss and transfusion	Significant haemorrhage managed with transfusion of 3 units PRBC and four units FFP.
Hospital course	Uncomplicated recovery; discharged on postoperative day 5 in stable condition
Follow-up advice	Advised to avoid pregnancy for 6-12 months; use appropriate contraception; obtain early ultrasound in future pregnancies to rule out recurrence.
Patient perspective	During follow-up, the patient expressed relief and satisfaction with the care provided and demonstrated understanding of future precautions and follow-up advice."