

CASE REPORT

Point-of-care ultrasound (POCUS) for diagnosing cesarean scar ectopic pregnancy in the emergency department

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ABSTRACT

Background: Cesarean scar ectopic pregnancy (CSEP) is a rare but potentially life-threatening type of ectopic pregnancy in which implantation occurs within the myometrial defect of a prior cesarean scar. Early recognition is critical because of the risk of severe hemorrhage, uterine rupture, loss of fertility, and maternal death. We report a case in which a CSEP was diagnosed by a point-of-care ultrasound (POCUS), which highlighted key sonographic findings.

Case Presentation: A 37-year-old female presented with lower abdominal pain and amenorrhea. The investigations were positive for pregnancy. POCUS revealed a viable ectopic pregnancy embedded within the myometrium at the cesarean scar, with endogenous growth toward the uterine cavity. These findings were consistent with those of the CSEP, which prompted an emergent obstetric consultation for definitive treatment.

Conclusion: This case highlights the potential of POCUS in the emergency setting to expedite CSEP diagnosis and prompt early obstetric consultation, where early recognition may improve clinical outcomes. Therefore, it is important for emergency physicians to recognize the sonographic features of CSEP.

Keywords: Cesarean scar, ectopic pregnancy, point-of-care ultrasound, case report.

Introduction

Cesarean scar ectopic pregnancy (CSEP) is very rare, but an increasingly recognized form of ectopic pregnancy in which the embryo is implanted within the myometrial defect of a previous cesarean incision [1]. Rising cesarean delivery rates worldwide have contributed to its growing prevalence [1–2]. Because delayed diagnosis can lead to uterine rupture and critical hemorrhage, maintaining early clinical suspicion is essential, particularly among women with prior cesarean sections [1]. We report a case in which a CSEP was diagnosed by point-of-care ultrasound (POCUS), highlighting key sonographic findings and the importance of early identification in patients with a history of cesarean delivery presenting during early pregnancy.

Case Presentation

A 37-year-old woman (gravida 5, para 4) presented to the emergency department with lower abdominal pain, moderate in severity, and without vaginal bleeding or a history of trauma. She had four prior cesarean deliveries. The patient's calculated gestational age was 8 weeks

based on the last menstrual period. The pregnancy was conceived naturally. Upon examination, her vital signs were within the normal range, and her abdomen was soft with mild lower abdominal tenderness. The pregnancy test was positive, with a quantitative beta-hCG concentration of 58,534 mIU/mL. A transabdominal and transvaginal POCUS was performed. POCUS revealed a viable ectopic pregnancy embedded within the myometrium at the cesarean scar, with endogenous growth toward the uterine cavity (Figures 1–3). These findings were consistent with those of a CSEP. The patient was admitted to the hospital under the obstetrics and gynecology team for definitive management.

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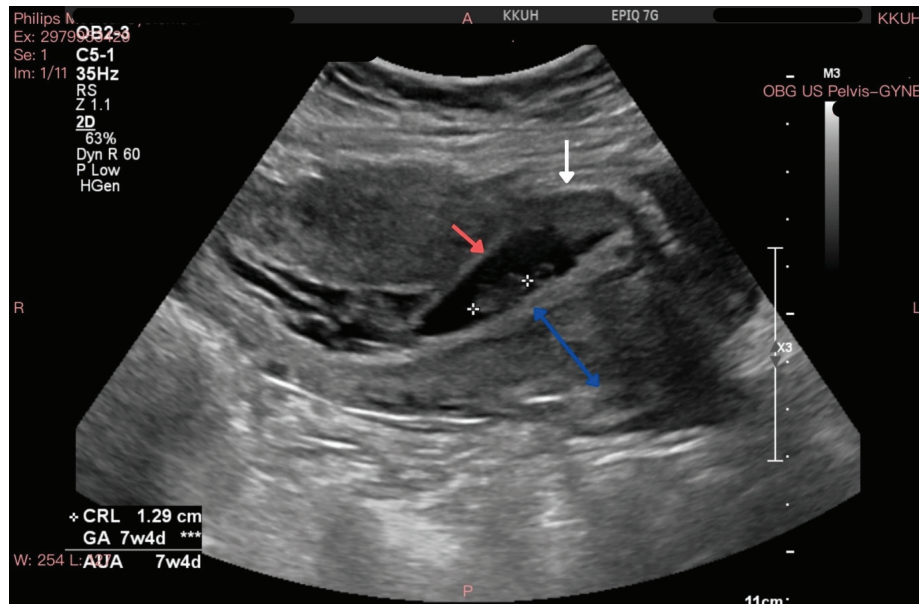


Figure 1. Transabdominal POCUS demonstrated a sagittal view of the uterus with a gestational sac located in the anterior part of the uterus. The white arrow indicates thinning of the anterior aspect of the myocardium at the area of the cesarean scar, the red arrow indicates a gestational sac implanted into the anterior myometrium with progressive growth of the sac toward the uterine cavity, and the blue arrow indicates normal thickness of the posterior myometrial wall. Gestational sac diameter and crown-rump length yield an estimated gestational age of 7 weeks + 4 days.

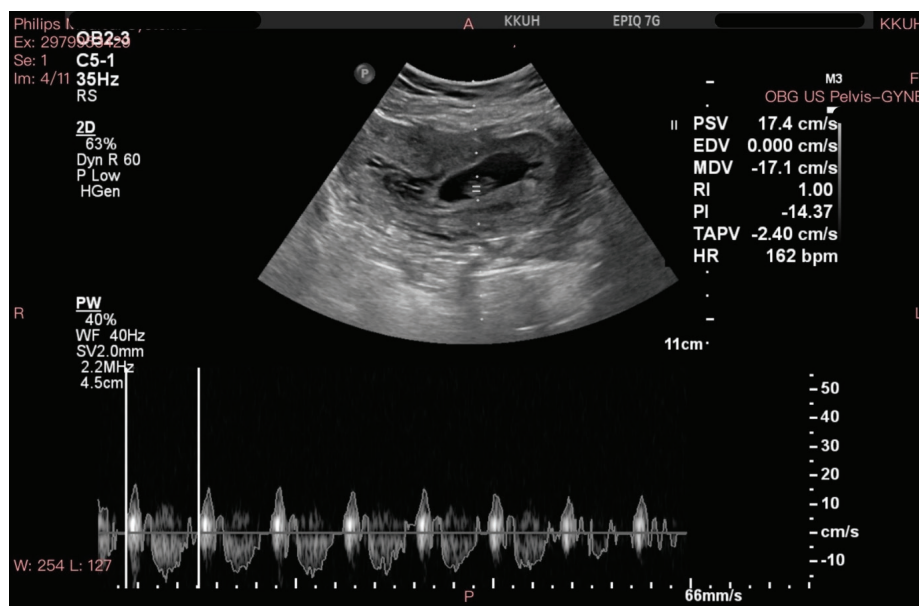


Figure 2. Transabdominal POCUS demonstrated a sagittal view of the uterus with a gestational sac and a viable embryo with a fetal heart rate of 162 bpm.

Discussion

CSEP is broadly classified into two subtypes: endogenic and exogenic [1]. The endogenic form, also described as “on the scar,” develops toward the uterine cavity, whereas the exogenic form (“in the niche”) results from deep implantation within the cesarean scar defect, with potential extension toward the bladder or abdominal cavity [1].

Transvaginal ultrasound remains the primary imaging modality [1–3]. The diagnostic criteria for CSEP, as described by the Royal College of Obstetricians and Gynecologists, include an empty uterine cavity, a gestational sac embedded anteriorly at the level of the internal os embedded at the site of the previous lower uterine segment of the cesarean section scar, a thin (1–3 mm) or absent myometrium between the gestational sac and the bladder, a prominent trophoblastic/placental



Figure 3. Transvaginal POCUS demonstrated thinning of the anterior myometrium between the gestational sac and uterine serosa, with a myometrial layer thickness of 1.8 mm anterior to the gestational sac.

circulation on Doppler, and an empty endocervical canal [4]. The patient met all these criteria. However, these diagnostic criteria have not undergone formal validation and are primarily based on findings reported in descriptive case series [4]. Several features of CSEP are shown in Figures 1–3.

It is critical to differentiate CSEP pregnancies from low intrauterine pregnancies (IUP) and cervical ectopic pregnancies. In CSEP, the gestational sac is positioned proximally to the midpoint axis of the uterus with a deficient anterior myometrium, whereas in a low IUP, the sac is located distally to the midpoint axis surrounded by a preserved myometrial mantle [3]. Additionally, CSEP can be distinguished from a cervical ectopic pregnancy by its location relative to the internal cervical os [2]. CSEP is implanted in the lower uterine segment above the level of the internal os, whereas in cases of cervical ectopic pregnancy, it is embedded within the cervical stroma below the level of the internal os [2]. Moreover, the “sliding sign”—where transducer pressure causes the gestational sac to move against the endocervical canal—can help exclude an evolving pregnancy loss or miscarriage, as the gestational sac remains fixed and does not slide in an implanted cervical or CSEP [4].

Conclusion

In this case, POCUS was useful for early recognition and expedited specialized care. Awareness of the imaging features of cesarean scar ectopic pregnancy is important for emergency physicians [5]. While POCUS holds promise for earlier diagnosis, ongoing education and training are essential for improving diagnostic accuracy and patient outcomes.

List of Abbreviations

CSEP Cesarean scar ectopic pregnancy

ED Emergency department
IUP Intrauterine pregnancy
POCUS Point-of-care ultrasound

Acknowledgment

None.

Conflict of interest

The authors declare that they have no conflicts of interest.

Authors Contributions

All the authors contributed equally to this manuscript. All the authors take responsibility for the integrity of this work.

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Consent for publication

Informed consent was obtained from the patient. All the authors consent to the publication of this manuscript. All identifying details have been removed to ensure patient confidentiality.

Ethical approval

Ethical approval is not needed at our institution for the publication of an anonymous case report.

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