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CASE REPORT

A case of cesarean scar ectopic: a rare but important form of ectopic pregnancy

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Abstract
Introduction This is a case of a 35-year-old G4P3 female with history of one prior cesarean section who presented to the emergency department with vaginal bleeding. She was found to be pregnant, and an ultrasound identified a cesarean scar ectopic pregnancy.
Methods This is a case report and brief review of the literature.
Conclusion Cesarean scar ectopic is a rare form of ectopic pregnancy that implants within the myometrium at the site of a prior cesarean section scar. It carries the potential for serious maternal morbidity and mortality, including complications like uterine rupture, life-threatening hemorrhage, and need for hysterectomy. All sonographers who scan patients in first-trimester pregnancy should be aware of the criteria to diagnose this entity, as cesarean scar ectopic can otherwise be confused with cervicoisthmic pregnancy or spontaneous abortion in progress.

Keywords Ectopic pregnancy · Cesarean section · Cesarean scar ectopic · Ultrasound

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Case report

A 35-year-old G4P3 female presented to the emergency department (ED) with 1 day of vaginal bleeding and abdominal cramping. Her last menstrual period was 6 weeks 1 day prior. Her first two pregnancies had been full term normal spontaneous vaginal deliveries. Her third pregnancy was a cesarean section at 37 weeks, 2 years prior to this ED presentation.

Her blood pressure was 150/84, heart rate 89, respiratory rate 20, room air oxygen saturation 96%, and temperature 37.4°C. On examination, the patient was not in distress, her abdomen was mildly tender with no guarding, and the gynecologic examination revealed a normal sized uterus, closed cervix, mild bleeding, and no cervical motion tenderness.

On lab testing, hemoglobin was 15.8 g/dL and serum beta-HCG was 3,456 mIU/mL.

A pelvic ultrasound was obtained revealing an endometrial cavity without evidence of an intrauterine gestational sac. However, a gestational sac with a 4-mm yolk sac was evident within a defect in the anterior myometrium in the lower uterine segment, corresponding to the site of her prior cesarean section (Figs. 1, 2). The myometrium anterior to the sac was noted to be thinned, approximately 2 mm in the anterior–posterior dimension. There was no evidence of cardiac activity or free fluid. These findings were interpreted to represent a cesarean scar ectopic pregnancy.

After consultation by obstetrics/gynecology, the patient received systemic methotrexate and was discharged. She received another dose of systemic methotrexate 1 week later, and her subsequent follow-up was uneventful.

Discussion

Ectopic pregnancy is the leading cause of pregnancy-related first-trimester death in the United States, occurring in

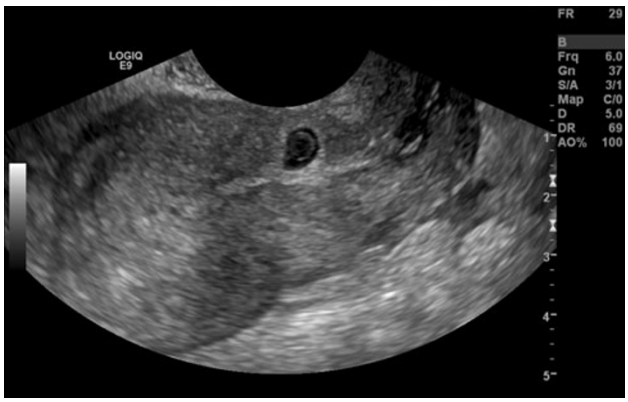

Fig. 1 Endovaginal sagittal view of a gestational sac with a yolk sac within a cesarean scar

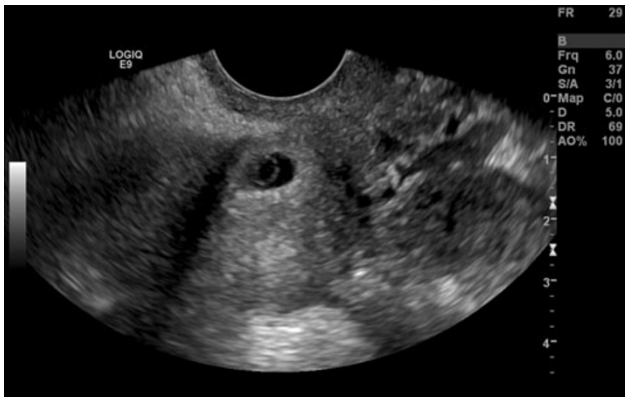

Fig. 2 Endovaginal coronal view of a gestational sac with a yolk sac within a cesarean scar

approximately 2% of pregnancies [1]. They are most commonly located in the fallopian tube, with 75–80% in the ampullary portion, 10% in the isthmic portion, 5% in the fimbrial end, 2–4% in the interstitial end, also known as cornual ectopic, and 0.5% in the ovary. Abdominal, cervical, and cesarean section scar ectopic pregnancies are rare [2].

Cesarean scar ectopic pregnancy is an unusual type of ectopic where the embryo implants in the myometrium of a previous cesarean scar. The exact incidence is unknown. It has been estimated to range from 1:1800 to 1:2216 pregnancies based on one study following a single center and one case series [3, 4].

It is hypothesized that the conceptus invades into the myometrium through a microscopic defect in the scar. This defect is secondary to poor vascularization of the lower uterine segment with subsequent fibrosis and incomplete healing. As such, the gestational sac is completely surrounded by myometrium and scar tissue and is completely separate from the endometrial cavity [3].

Patients may present with vaginal bleeding, abdominal pain, or hemodynamic instability, but it may also be an incidental finding. Rotas et al. [5] found that 36.8% of patients in their case series were asymptomatic at initial presentation.

Ultrasound is the primary diagnostic modality. Rotas et al. [5] report in their case series that endovaginal ultrasound correctly diagnosed 94 of 111 cases, a sensitivity of 84.6% (95% CI 0.763–0.905). The remaining 17 cases were incorrectly diagnosed as cervical pregnancies or incomplete abortions [5].

Vial et al. [6] proposed the following ultrasound criteria, which have generally been accepted as diagnostic.

- Presence of a gestational sac between the bladder and the anterior uterine wall.
- Empty uterus.
- Empty cervical canal.
- Discontinuity in the anterior wall of the uterus on a sagittal view of the uterus running through the gestational sac.

In addition, Godin et al. [7] describe an absence of healthy myometrium between the bladder and the sac. The thickness of the myometrium between the gestational sac and the bladder has been reported to be less than 5 mm in two-thirds of cases [8]. Jurkovic et al. [3] also describe the negative 'sliding organ sign', defined as the inability to displace the gestational sac from its position at the level of the internal os using gentle pressure applied by the endovaginal probe. Maymon et al. [9] support the use of transabdominal scanning with a full bladder as an adjunct to appreciate a 'panoramic view' of the uterus and to acquire an accurate measurement of the distance between the gestational sac and the bladder.

Color Doppler may enhance the diagnostic ability of endovaginal ultrasound by demonstrating peritrophoblastic perfusion surrounding the gestational sac (Fig. 3). Spectral Doppler should demonstrate high velocity (peak velocity

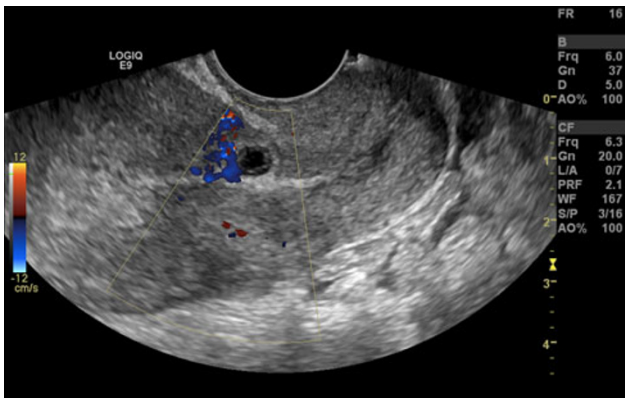

Fig. 3 Endovaginal sagittal view with color Doppler demonstrating vascularity around a cesarean scar ectopic

>20 cm/sec), low impedance (pulsatility index <1) waveforms [3].

Because this is such a rare condition, there is no standardized approach to the treatment. The medical literature has reported the use of systemic methotrexate, local injection of embryocides, surgical sac aspiration, hysteroscopic evacuation, laparoscopic removal, open surgical treatment, and hysterectomy [10]. Most authors agree that expectant management is not appropriate given the significant risk of uterine rupture [9]. The literature also consistently reports that dilation and curettage are inadequate because the trophoblastic tissue is actually located outside the uterine cavity and unreachable. Such attempts can potentially rupture the uterine scar with devastating consequences [5].

The major differential diagnoses to consider are cervicoisthmic pregnancy and spontaneous abortion in progress. Distinguishing these entities from a cesarean scar ectopic can be difficult, and as the pregnancy progresses, the distinction between cesarean scar ectopic, cervical pregnancy, and low intrauterine pregnancy becomes even more difficult [3]. In a cervicoisthmic pregnancy, there should be a layer of healthy myometrium between the bladder and the gestational sac [7]. In a spontaneous abortion in progress, the gestational sac should be seen in the cervical canal, and color Doppler should demonstrate an avascular sac, unlike a well-perfused cesarean scar ectopic [3].

Conclusion

Because of its potential for both morbidity and mortality, including complications like uterine rupture, life-threatening hemorrhage and need for hysterectomy, healthcare professionals should maintain a heightened index of suspicion for the possibility of cesarean scar ectopic pregnancy. Sonographers who scan patients in first-trimester pregnancy should be aware of the diagnostic criteria, as well as findings to help distinguish this diagnosis from cervicoisthmic pregnancy and spontaneous abortion in progress.

Conflict of interest None.

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