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Case Report

Sonographic diagnosis of an interstitial pregnancy in an asymptomatic patient at 7 weeks' gestation ☆

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ABSTRACT

An interstitial pregnancy is an ectopic pregnancy located within the proximal intramural segment of the Fallopian tube traversing the myometrium. This type of ectopic pregnancy is relatively rare, occurring in approximately 1%-3% of all ectopic pregnancies. Given the myometrial mantle surrounding the gestational sac, which is considerably thicker than in other tubal pregnancies, patients with interstitial pregnancies classically manifest symptoms later in gestation. Thus, there is an increased risk of life-threatening intraperitoneal hemorrhage upon rupture of the myometrium encompassing the pregnancy. We present an unusual case of early sonographic diagnosis of an interstitial pregnancy in an asymptomatic patient at 7 and 3/7 weeks' gestation, discuss predisposing factors, hallmarks of sonographic diagnosis, and review the literature regarding available clinical management modalities. With the increasing application of point of care ultrasound (POCUS) by emergency room physicians and other providers in outpatient facilities, our case emphasizes both the importance of correct sonographic identification of interstitial pregnancy and the clinical importance of uniform early first-trimester sonography, preferably no later than 7-8 weeks' gestation.

Introduction

An interstitial pregnancy is an ectopic pregnancy located within the proximal intramural segment of the Fallopian tube traversing the myometrium. This type of ectopic pregnancy is relatively rare, occurring in approximately 1%-3% of all ectopic pregnancies [1]. Predisposing factors include: ipsilateral salpingectomy, previous ectopic pregnancy, partial salpingectomy, previous uterine surgery, uterine malformations and in vitro fertilization [1,2]. Interestingly, twin and gestational trophoblastic disease interstitial pregnancies (including hydatidiform mole, invasive mole and choriocarcinoma) have been reported [3–7].

Given the myometrial mantle surrounding the gestational sac, which is considerably thicker than in other tubal pregnan-

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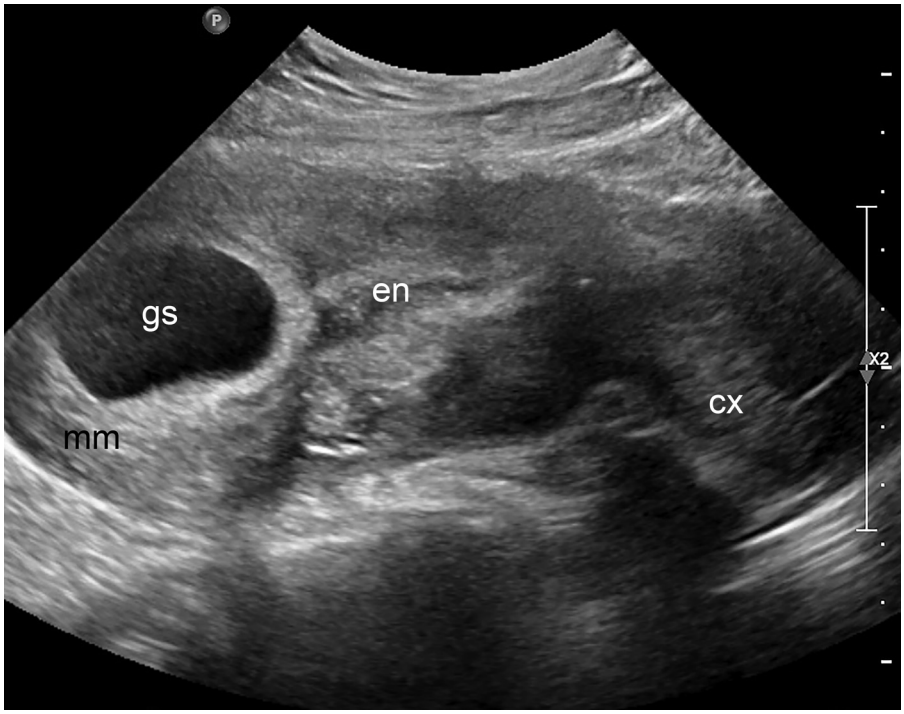

Fig. 1 – Sagittal suprapubic transabdominal ultrasound at 7 and 3/7 weeks' gestation. Note cervix (cx), the endometrial cavity (en) devoid of an intrauterine gestation, and the interstitial gestational sac (gs), surrounded by a thick myometrial mantle (mm).

cies, patients with interstitial pregnancies classically manifest symptoms later in gestation. Thus, there is an increased risk of life-threatening intraperitoneal hemorrhage [1,2,8,9]. Notwithstanding, recently hemorrhagic complications (rupture) have been reported at considerably earlier gestational ages of 7 weeks [9]. We present an unusual case of early incidental sonographic diagnosis of an interstitial pregnancy in an asymptomatic patient at 7 and 3/7 weeks' gestation, discuss predisposing factors, hallmarks of sonographic diagnosis and review the literature regarding available clinical management modalities.

Case report

A 39-year-old G3P1011, presented at 7 and 3/7 weeks' gestation for ultrasonographic assessment of gestational age and viability. Her medical history was significant for a previous Cesarean delivery for arrest of descent and previous abdominal myomectomy 3 years prior to her current presentation. She was asymptomatic and serum beta hCG level was 223,989.9 mIU./mL. Transabdominal ultrasound revealed an endometrial cavity devoid of a gestational sac. The upper right aspect of the uterus contained a gestational sac, surrounded by a thick myometrial mantle (Fig. 1). An embryo with a crown rump length (CRL) of 16.9 mm and positive cardiac activity (149 bpm) was noted within the gestational sac. These findings were considered consistent with an interstitial pregnancy. Angled transabdominal ultrasound insonation depicted the gestational sac abutting the endometrium (Fig. 2). Transvaginal ultrasound depicted the retroverted uterus devoid of a pregnancy within the endometrial cavity. The gestational sac was located within close proximity to, yet distinctly separate from the endometrial cavity and surrounded by a thick myometrial mantle, confirming the diagnosis of an early interstitial pregnancy (Fig. 3). The patient was counseled and underwent laparotomy. Cornual resection was performed, removing the interstitial pregnancy and ipsilateral Fallopian tube. The patient tolerated surgery well, and was discharged in good health on postoperative day 2. Pathology assessment of the resected surgical specimen confirmed an interstitial pregnancy.

Discussion

The tenets of sonographic diagnosis of interstitial pregnancy consist of an endometrial cavity devoid of a gestational sac and the presence of a gestational sac surrounded by a myometrial mantle in close proximity to, essentially abutting, yet distinctly separate, from the endometrial cavity. Although ultrasound is considered the gold standard for diagnostic imaging of this condition, 3-dimensional ultrasound and magnetic resonance (MR) imaging have been reported as potentially useful when ultrasound studies are insufficient or equivocal [10–13]. Clinical management modalities vary and encompass a wide range of medical, surgical and interventional radiology modalities [4,14–23]. In general, the chosen mode of clinical management will depend on gestational age at diagnosis, the presence

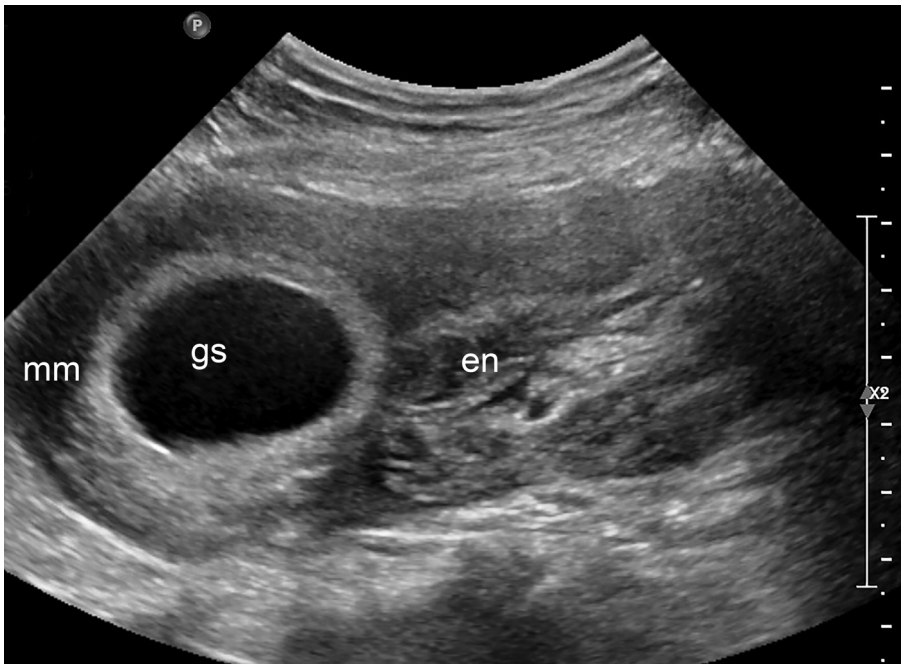

Fig. 2 – Angled transabdominal image depicting the interstitial gestational sac (gs) abutting the endometrium (en). Note the thick myometrial mantle (mm).

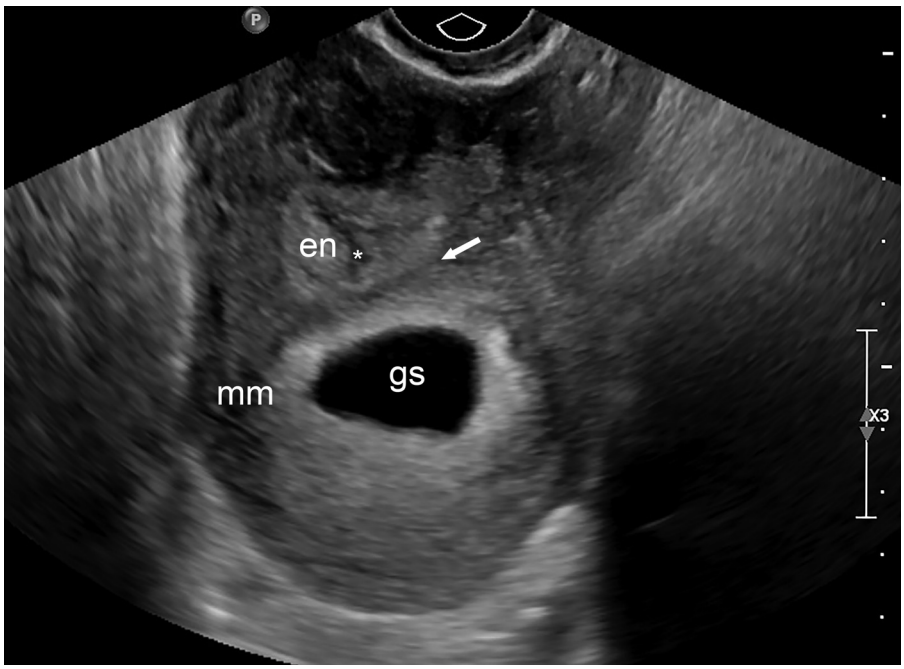

Fig. 3 – Transvaginal image definitively depicting the interstitial gestational sac (gs) adjacent to, yet *distinctly* separate from the endometrial cavity (*). Note the clear demarcation between the folds of endometrium (en) and interstitial pregnancy (arrow), as well as the thick myometrial mantle (mm).

or absence of intraperitoneal hemorrhage / rupture, hemodynamic status of the patient, and physician / patient preference. Available therapeutic modalities include: locally injected potassium chloride (KCL), locally injected Methotrexate, systemic (intramuscular) Methotrexate (with or without adjunct Mifepristone), uterine artery embolization, cornual resection by laparoscopy or laparotomy, or rarely reported, ultrasound-guided or hysteroscopy-guided transcervical suction aspiration of the pregnancy (accessed through the endometrial cavity) [4,14–23].

Reportedly, the majority of cases of interstitial pregnancy are detected after complications have occurred [1]. Marchand et al., in a systemic meta-analysis of 855 case studies, reported lower blood loss, and shorter operative time associated with laparoscopy versus open surgery (168 mL vs 1,163 mL, and 63.2 minutes vs 78.2 minutes, respectively) [1].

Although, in our case, the patient and physician opted for laparotomy, early sonographic diagnosis of interstitial pregnancy opens the venue for any of the above-mentioned conservative, organ preserving, nonsurgical management modalities.

With the increasing application of point of care ultrasound (POCUS) in outpatient and emergency room settings, it is critical that professional medical personnel who may encounter either symptomatic or asymptomatic patients (as ours) become familiar with the sonographic appearance of interstitial pregnancy to avoid potential misdiagnosis, as has been reported [24–27].

Although not yet considered standard of care by governing bodies in developed, industrialized countries worldwide, our case emphasizes the importance of early first-trimester sonography in depicting precise pregnancy location. Early sonographic depiction of pregnancy location at <8 weeks' gestation may also provide sonographic diagnosis of other additional unusual ectopic pregnancies including Cesarean scar and cervical pregnancies. Such early detection could also enhance conservative, organ preserving, non-surgical management of these cases, which if undiagnosed, entail similar dangers of potentially life-threatening hemorrhage.

Patient consent

Informed consent has been obtained from the patient.

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