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Angular vs. interstitial pregnancy: A case report highlighting diagnostic nuances with stark management differences

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ABSTRACT

Background: In the literature, the terms "angular", "interstitial" and "cornual" have often been inappropriately interchanged. The consequence is under-recognition of their differences as well as inaccurate imaging guidelines which do not reliably distinguish them as distinct entities. Angular pregnancies should be considered viable and may be managed to term.
Case: A woman at 7w5d was transferred for surgical management of a presumed interstitial ectopic pregnancy. Sonography and MRI confirmed an eccentric fundal pregnancy with a thin myometrial mantle of 2–5 mm; the diagnosis of interstitial pregnancy was favored. Upon laparoscopy, the round ligament was displaced lateral to the pregnancy bulge and the diagnosis of angular pregnancy was thus apparent. The pregnancy was continued to term and delivered via repeat cesarean section without incident.
Conclusion: Angular and interstitial pregnancies are different entities which cannot always be reliably distinguished via imaging alone. Diagnostic laparoscopy may be a final step in determining pregnancy location. Angular pregnancies should be considered potentially viable and may be managed to term.

1. Introduction

Despite being described over a century ago [1], "angular pregnancy" remains an under-recognized entity and is often confused with the terms "cornual pregnancy" and "interstitial pregnancy". Understanding the differences between the terms, however, is paramount, as their risks, potential for viability, and management options differ.

An angular pregnancy is an eccentric *intra*uterine pregnancy with implantation of the embryo in the lateral superior angle of the uterine cavity. It results in asymmetric enlargement of the uterus and lateral displacement of the round ligament [2]. Angular pregnancy is seldom discussed in the medical literature, with <100 cases reported, and is perceived to be rare [3]. An interstitial pregnancy is an ectopic, or *extra*uterine, pregnancy resulting when implantation occurs within the myometrial fallopian tube, or interstitium. It results in no lateral displacement of the round ligament [2]. Interstitial pregnancies comprise 2–4% of all ectopic pregnancies [4]. A cornual pregnancy historically describes the *intra*uterine fundal implantation within the anomalous bicornuate or septate uterus.

Despite these distinct definitions, examples from the current literature demonstrate inconsistent and inappropriate use, and the term "cornual" has been applied to interstitial or angular pregnancies [5,6]. Even in authoritative textbooks, the terms are often interchanged or the concept of angular pregnancy is completely ignored. Prior to the 2014 edition of Williams' Obstetrics, the terms angular, cornual, and interstitial pregnancies were not distinguished from one another [7]. This laxity in terminology has contributed to difficulties in developing ultrasonographic diagnostic criteria to distinguish these pregnancy locations from one another and may have led to an underappreciation of the incidence of angular pregnancies.

2. Case Report

A 33yo G3P1101 was transferred at 7w5d for management of a presumed interstitial ectopic pregnancy. The pregnancy was eccentrically located in the right cornua with an overlying myometrial thickness measuring first 5 mm and then 3.5 mm on ultrasounds performed at 6 and 7wks estimated gestational age. Her prior pregnancies included a full-term NSVD followed by a 36wk IUFD of mono/di twins delivered via cesarean section.

The patient reported light spotting but no abdominal pain. Repeat vaginal sonogram demonstrated a pregnancy in the right cornual region consistent with 7w5d gestation with a heart rate of 170 bpm. Blood was noted within the endometrial cavity. The over-riding myometrial mantle was 5–8 mm and no interstitial line sign could definitively be seen (see Fig. 1). Non-contrast MRI revealed a mantle measurement as little as 2 mm (Figs. 2 and 3). The diagnosis of an interstitial pregnancy was favored.

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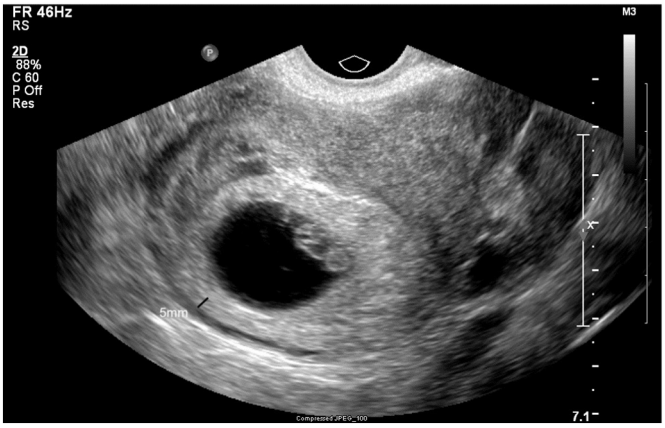

Fig. 1. Transverse transvaginal sonography of 7w5d gestation and line marking the right myometrial mantle thickness of only 5 mm.

The decision was made to proceed with termination. The patient emphasized her strong desire to maintain any viable pregnancy, regardless of the risk of future morbidity, if evidence was found to support an intrauterine pregnancy. A combined laparoscopic and hysteroscopic approach for termination was planned; laparoscopy to confirm the diagnosis, temporarily occlude the uterine blood supply, and monitor for perforation that may occur with our preferred route for hysteroscopic evacuation. The patient additionally gave consent for a laparoscopic cornual resection or hysterectomy, if needed, and surgery was performed the following day. The laparoscopic view of the uterus was remarkably normal (Fig. 4). A slight bulge could be seen at the right cornua which was palpably softer than the rest of the uterus. There were no abnormal vascular changes and the extrinsic right tube appeared normal (Fig. 5). Importantly, the right round ligament insertion remained lateral to the pregnancy (Fig. 5). An angular pregnancy, a lesser known and potentially viable form of intrauterine pregnancy, was thus diagnosed. The procedure was discontinued given the patient's wishes to maintain any potential viable pregnancy.

At her first trimester screen, the myometrial mantle remained thin at 5 mm. She had a normal level II ultrasound at 20wks and serial growth scans starting at 32 weeks. She developed type A1 gestational diabetes. She underwent a scheduled, uncomplicated, repeat Cesarean

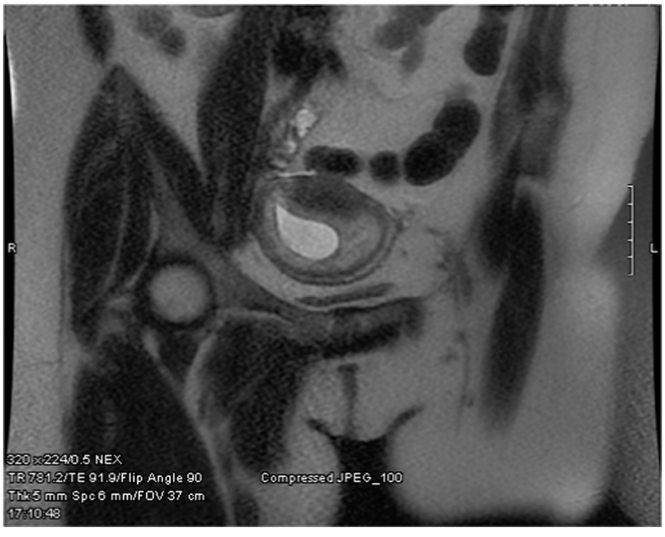

Fig. 2. T2-weighted Coronal MRI demonstrating the asymmetric location of the gestational sac which extends into the right cornua.

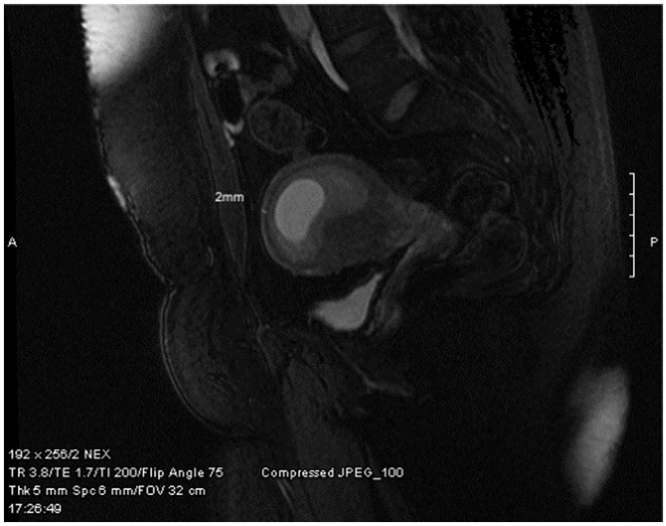

Fig. 3. T1-weighted Sagittal MRI demonstrating a myometrial thickness of just 2 mm.

delivery at 37 weeks and delivered a healthy, male infant weighing 8lb8oz.

3. Discussion

Despite being described over a century ago, angular pregnancy remains an obscure entity, with <100 cases reported in the literature, and is perceived to be rare [3]. The first 39 cases were compiled in a systematic review published in 1981 and reported a 38.5% chance of spontaneous abortion, 13.6% chance for uterine rupture, and a 28% live birth rate [2]. This was updated in 2014 with the addition of 46 subsequent cases, adjusting estimates to 18% risk of spontaneous abortion and 28% risk of uterine rupture [3]. The overall live birth rate was similar at 25%, but of those pregnancies managed expectantly and not terminated, this rose to 69%. With the addition of our case, only 31 instances of expectant management to viability resulting in a liveborn fetus have been reported in the literature [3,8,9].

While angular pregnancies should be considered a potentially viable intrauterine pregnancy, there is a significantly increased risk of uterine rupture when expectant management is chosen. Spontaneous uterine

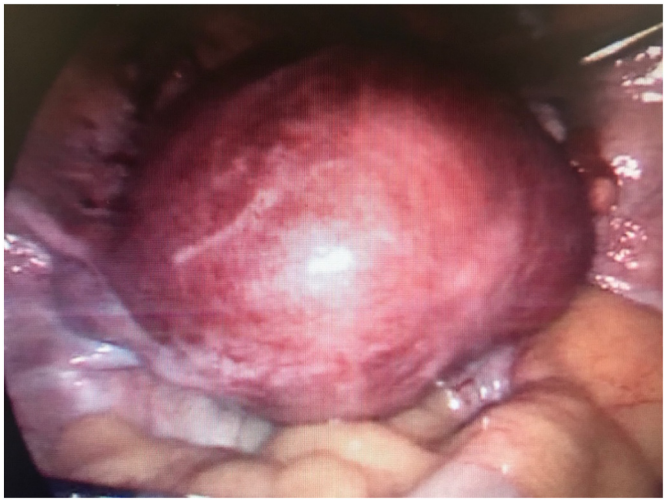

Fig. 4. Laparoscopic view of the uterine fundus.