

## Angular Pregnancy

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Received: 23.02.2016

Received in revised form: 09.05.2016

Accepted: 16.05.2016

Available online: 15.02.2018

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**ABSTRACT** The terms interstitial (cornual) and angular pregnancies have been used inconsistently along the medical literature for decades. Angular pregnancy, a type of ectopic pregnancy, is a rare obstetric condition that can be life-threatening. In this situation, the embryo is implanted in the lateral angle of the uterine cavity, medial to the utero-tubal junction and round ligament. Angular pregnancy must be distinguished from interstitial pregnancy, in which the embryo is implanted lateral to the round ligament. The gestational sac may descend into the uterine cavity. But still 23% of cases are associated with uterine rupture. Patients at risk should be explained, and it should be given the option of terminating the pregnancy.

**Keywords:** Pregnancy, ectopic; pregnancy complications; pregnancy trimester, first

Ectopic pregnancy happens with the implantation of a fertilized ovum outside of the endometrial cavity. It accounts for almost 2% of all pregnancies. The tuba uterina is the most common site for an ectopic pregnancy.<sup>1</sup> Ectopic pregnancy involving implantation in the cervix, the interstitial segment of tube, the ovary, a cesarean scar or the abdomen account for less than 10% of all ectopic pregnancies. They are associated with higher morbidity.<sup>2</sup>

The term “angular pregnancy” arises, defined as “implantation within the endometrium of the lateral angle of the uterus, medial to the utero-tubal junction”.<sup>3</sup> It is important to differentiate between interstitial and angular pregnancies. These conditions are separate entities with completely different conduct, management, and outcomes.<sup>4</sup>

The distensibility of the surrounding myometrial tissue allows for development of the pregnancy into the second trimester. This condition often leading to a late presentation.<sup>5</sup> There is a potential for severe life-threatening haemorrhage in case of cornual rupture and high maternal morbidity and mortality. Because it is located in the highly vascular cornual tubal junction.<sup>6</sup>

In this paper, we present a case of an angular pregnancy and discuss the diagnostic and treatment strategies employed. Additionally, this case is to clarify the terms interstitial, and angular pregnancy.

### CASE REPORT

A 41-year-old woman, gravida 3, para 2 was referred with vaginal spotting, to Konya Necmettin Erbakan University Meram Faculty of Medicine, De-

partment of Obstetrics and Gynecology. A transvaginal scan was performed and showed a gestational sac with a regular outline eccentrically located in the right uterine angle. At 5+4 weeks' gestation 2D sonography revealed a thin (<5 mm) myometrial layer surrounding the gestational sac. The gestational sac was located close to the internal ostium of the right tuba uterina (Figure 1a, b). This was indicative of a right angular ectopic pregnancy.

Repeat ultrasound scan 7 days later confirmed right angular location of the gestational sac, with a gestational sac diameter of 16 mm and a myometrial thickness of 2,7 mm. Her serum human chorionic gonadotropin (hCG) level was 10,560 mIU/mL. At this time, detailed discussion was had with the patient outlining the risks of morbidity and mortality for her and the likely poor prognosis for the pregnancy. After a detailed discussion as the patient want to terminate the pregnancy. Gentle suction curettage under general anesthesia was done. The patient was followed-up with regular serial serum  $\beta$ -hCG measurements until the level was below 5 IU/l (Figure 2). The patient's post-curettage course was uneventful, and her serum hCG level normalized within 2 weeks. A transvaginal ultrasound scan control 2 weeks later revealed a normal uterine wall, with normal uterine adnexa.

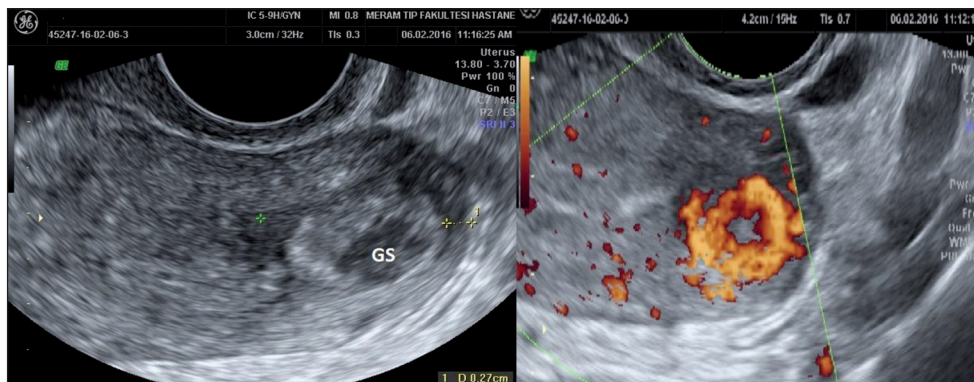
## DISCUSSION

The terms interstitial (cornual) and angular pregnancies have been used inconsistently along the

medical literature for decades. Understanding the differences among these entities can have significant clinical implications. Because management and results differ among them.

Angular pregnancy refers to a viable intrauterine pregnancy that is implanted in one of the lateral corners of the uterine cavity, medial to the utero-tubal junction. Full-term delivery is probably as the gestational sac descends into the uterine cavity. However, a few complications have been described. Angular pregnancies end in abortion in 38.5% of patients, and 23% of cases are associated with uterine rupture.<sup>7</sup> The gestational sac may descended into the uterine cavity.<sup>8</sup> The traditional surgical treatment options for angular pregnancy include cornual resection at laparotomy or hysterectomy in the cases with severely damaged uterus.<sup>9</sup> As opposed to interstitial pregnancies, suction curettage is a treatment option for angular pregnancies.<sup>10</sup> But for this, it is necessary, to ensure that the pregnancy is angular. This patient was told that angular pregnancy. We were given information about prognosis. The patient wanted to terminate the pregnancy.

Interstitial pregnancy refers to implantation of the embryo in the intramural portion of the fallopian tube surrounded by the myometrium.<sup>8</sup> In the previous literature, authors have proposed the following diagnostic criteria based on 2D sonography: (1) an empty uterine cavity; (2) a chorionic sac separate and at least 1 cm from the lateral edge of the uterine cavity; and (3) a thin (<5 mm) myometrial



**FIGURE 1:** Angular pregnancy. **a, b** Two-dimensional sonogram and power Doppler sonogram. The gestational sac (GS) is located within the uterine cavity, although it appears to be deviated toward the left uterine angle. Note the thin myometrial layer (measuring 2.7 mm).

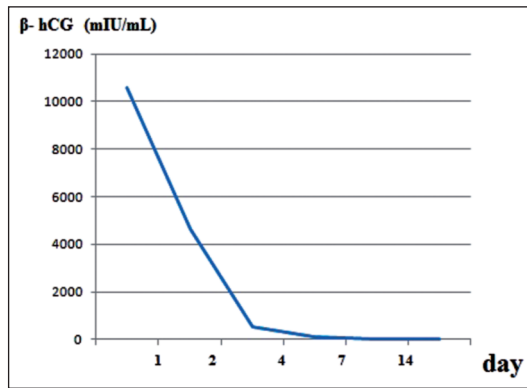


FIGURE 2: Serum β-hCG after suction curettage.

thickness surrounding the gestational sac.<sup>11</sup> Interstitial pregnancies can be treated with either conservative or surgical management. Nonsurgical treatment includes systemic or local injected methotrexate and local injection of other cytotoxic drugs directly into the gestational sac.<sup>12</sup> The estimated success rate for medical treatment of interstitial pregnancies is lower than that for treatment of ectopic pregnancies located in the tubal ampulla or isthmus. Because such pregnancies are generally associated with very high serum hCG levels.<sup>13</sup> Approximately 10% to 20% of patients with interstitial pregnancies who are treated with methotrexate


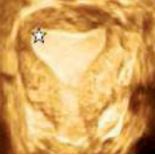
will ultimately require surgery for a rising hCG level, continued pain, or evidence of cornual rupture.<sup>12</sup> Additionally, true interstitial pregnancies can not be treated with curettage.

Cases considered as angular pregnancies may include interstitial pregnancies. Therefore, the real incidence of obstetric complications in patients with angular pregnancies remains unclear. Although a strategy of expectant management may be acceptable, continuous and careful monitoring of the mother and fetus is necessary.

Given the seriousness of the latter, angular pregnancy management considerations might potentially include therapeutic abortion. The key imaging finding to highlight regarding interstitial pregnancy is that it lies outside the endometrium (extra-endometrial). In contrast, the key imaging finding to highlight regarding angular pregnancy is that it lies within the endometrium (intra-endometrial) (Table 1).<sup>14,15</sup>

In conclusion, the terms “interstitial,” and “angular” pregnancies have been used inconsistently throughout the medical literature for decades. Precisely identifying the location of the gestational sac allows for appropriate management and helps pre-

TABLE 1: Summary of the differences between interstitial and angular pregnancy.

	Interstitial	Angular
Implantation location	Fallopian tube (interstitial segment)	Endometrial cavity (superior lateral aspect, just medial to the utero-tubal junction)
Relationship to the round ligament	Lateral	Medial
Relationship to the endometrium	Extra-endometrial	Intra-endometrial
Ectopic?	Yes	No
Prognosis-fetus	Nonviable (13)	Uncertain viability (13)
Prognosis-mother	Significant maternal morbidity and mortality if progresses to rupture	Increased risk of uterine rupture
Imaging findings	Interstitial line sign=thin echogenic line extending directly up to the center of ectopic pregnancy. Gestational sac seen separately from them os lateral edge of the uterine cavity, with myometrium between sac and endometrial cavity. Thinning of myometrial mantle to ≤5 mm thick	Gestational sac primarily surrounded by endometrium with adjacent thicker myometrial layer
Imaging		

vent possible subsequent morbidities. Although this case report has its limitations the authors nevertheless believe that this case contributes to the literature by clarifying the terms and elucidating their salient features. The gestational sac may descend into the uterine cavity. But still 23% of cases are associated with uterine rupture. Patients at risk should be explained. Therefore, it should be given the option of terminating the pregnancy.

### Acknowledgment

The authors wish to thank the family for agreeing to participate in this investigation.

### Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct

connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

**Idea/Concept:** Fedi Ercan; **Design:** Fedi Ercan; **Control/Supervision:** Ali Acar; **Data Collection and/or Processing:** Fatma Kılıç; **Analysis and/or Interpretation:** Ali Acar, Fedi Ercan; **Literature Review:** Fedi Ercan; **Writing the Article:** Fedi Ercan, Fatma Kılıç; **Critical Review:** Ali Acar; **References and Fundings:** Fedi Ercan.

## REFERENCES

- Barnhart KT, Sammel MD, Gracia CR, Chittams J, Hummel AC, Shaunik A. Risk factors for ectopic pregnancy in women with symptomatic first-trimester pregnancies. *Fertil Steril* 2006; 86(1):36-43.
- Clayton HB, Schieve LA, Peterson HB, Jamieson DJ, Reynolds MA, Wright VC. Ectopic pregnancy risk with assisted reproductive technology procedures. *Obstet Gynecol* 2006; 107(3):595-604.
- Parker RA, Yano M, Tai AW, Friedman M, Narra VR, Menias CO. MR imaging findings of ectopic pregnancy: a pictorial review. *Radiographics* 2012;32(5):1445-60.
- Mayer RB, Yaman C, Ebner T, Shebl O, Sommergruber M, Hartl J, et al. Ectopic pregnancies with unusual location and an angular pregnancy: report of eight cases. *Wien Klin Wochenschr* 2012;124(5-6):193-7.
- Dilbaz S, Katas B, Demir B, Dilbaz B. Treating cornual pregnancy with a single methotrexate injection: a report of 3 cases. *J Reprod Med* 2005;50(2):141-4.
- Isik H, Sahin U, Batioglu AS. Local methotrexate treatment of cornual and cervical ectopic pregnancies: report of six cases. *Turkiye Klinikleri J Gynecol Obst* 2012;22(2):131-6.
- Alves JA, Alves NG, Alencar Júnior CA, Feitosa FE, da Silva Costa F. Term angular pregnancy: successful expectant management. *J Obstet Gynaecol Res* 2011;37(6):641-4.
- Tanaka Y, Mimura K, Kanagawa T, Nakayama M, Matsuzaki S, Kinugasa-Taniguchi Y, et al. Interstitial pregnancy resulting in a viable infant coexistent with massive perivillous fibrin deposition: a case report and literature review. *AJP Rep* 2014;4(1):29-32.
- Karalok H, İlter E, Tufekci C, Akyol H, Batur O. [Unruptured cornual (interstitial) pregnancy: a case report]. *Turkiye Klinikleri J Gynecol Obst* 2005;15(5):274-6.
- Kambhampati L, Kitova-John M, Allahdin S, Voigt S. Suction curettage under laparoscopic vision for advanced angular pregnancy. *J Obstet Gynaecol* 2012;32(6):601-2.
- Timor-Tritsch IE, Monteagudo A, Matera C, Veit CR. Sonographic evolution of cornual pregnancies treated without surgery. *Obstet Gynecol* 1992;79(6):1044-9.
- Moawad NS, Mahajan ST, Moniz MH, Taylor SE, Hurd WW. Current diagnosis and treatment of interstitial pregnancy. *Am J Obstet Gynecol* 2010;202(1):15-29.
- Oron G, Tulandi T. A pragmatic and evidence-based management of ectopic pregnancy. *J Minim Invasive Gynecol* 2013;20(4):446-54.
- Arleo EK, DeFilippis EM. Cornual, interstitial, and angular pregnancies: clarifying the terms and a review of the literature. *Clin Imaging* 2014;38(6):763-70.
- Doubilet PM, Benson CB, Bourne T, Blaivas M; Society of Radiologists in Ultrasound Multispecialty Panel on Early First Trimester Diagnosis of Miscarriage and Exclusion of a Viable Intrauterine Pregnancy, Barnhart KT, Benacerraf BR, Brown DL, Filly RA, Fox JC, Goldstein SR, et al. Diagnostic criteria for nonviable pregnancy early in the first trimester. *N Engl J Med* 2013;369(15):1443-51.