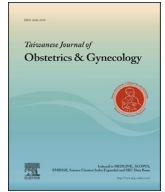




Contents lists available at ScienceDirect

Taiwanese Journal of Obstetrics & Gynecology

journal homepage: www.tjog-online.com

Research Letter

Diagnosis of interstitial ectopic pregnancy using a three-dimensional high-definition live rendering image

Ling-Yu Jiang^a, Peng-Hui Wang^{a, b}, Hsing-Yang Lee^{a, b}, Chih-Yao Chen^{a, b, c, *}^a Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, Taipei, Taiwan, ROC^b National Yang-Ming University, School of Medicine, Taipei, Taiwan, ROC^c Institute of Clinical Medicine, National Yang-Ming University, Taipei, Taiwan, ROC

ARTICLE INFO

Article history:

Accepted 14 August 2014

Interstitial pregnancy occurs in 1.1–6.3% of all ectopic pregnancies. Under two-dimensional (2D) ultrasound, an interstitial pregnancy presents as a gestational sac (GS) over the upper lateral aspect of the uterus and outside the uterine cavity, and is partially surrounded by the myometrium. However, a diagnosis is usually delayed until symptoms of rupture manifest, which are usually severe with a high morbidity. In this paper, we present a case of right interstitial ectopic pregnancy that was diagnosed using a three-dimensional (3D) high-definition (HD) live rendering image.

A 33-year-old woman, gravida 1 para 0, experienced frequent lower abdominal pain with vaginal bleeding. The estimated gestational age was approximately 7 weeks. Transvaginal sonography did not detect a GS in the uterine cavity. Two-dimensional transvaginal ultrasound revealed one GS near the right corner of the uterine cavity (Figure 1). The 2D image was not sufficiently clear to identify the exact location of the GS, which was near the right corner of the endometrium. We used 3D transvaginal ultrasound for further evaluation. Three-dimensional HD live transvaginal ultrasound revealed a GS at the right cornus (Figure 2). The crown-rump length was 1.72 cm with an estimated gestational age of 8 weeks + 2 days. The patient was diagnosed as having an interstitial pregnancy. She underwent laparoscopic surgery for partial hysterectomy and myomectomy (Figure 3). Her postoperative course was uneventful.

Ectopic pregnancy is common in women of reproductive age. Most ectopic pregnancies are tubal pregnancies. Which diagnostic

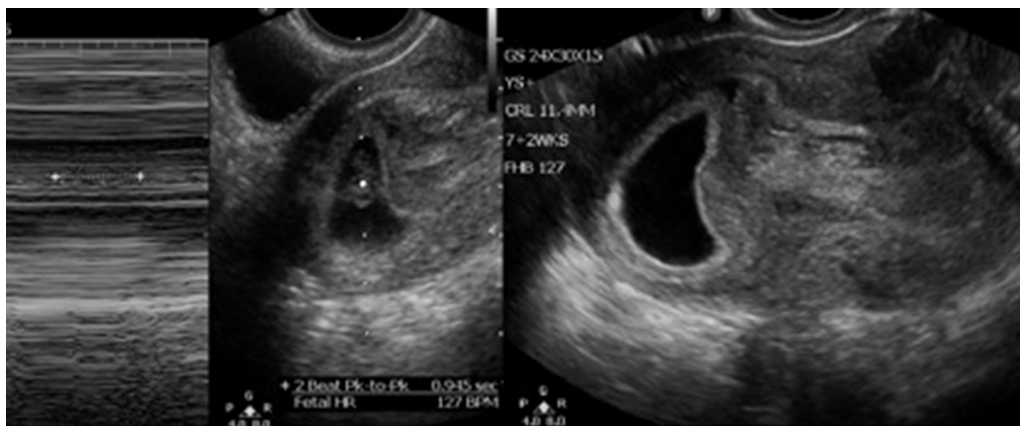


Figure 1. Traditional two-dimensional transvaginal ultrasound image of an interstitial pregnancy over the right side of the endometrial cavity.

* Corresponding author. Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei 112, Taiwan, ROC.
E-mail address: pocca.pocca@gmail.com (C.-Y. Chen).

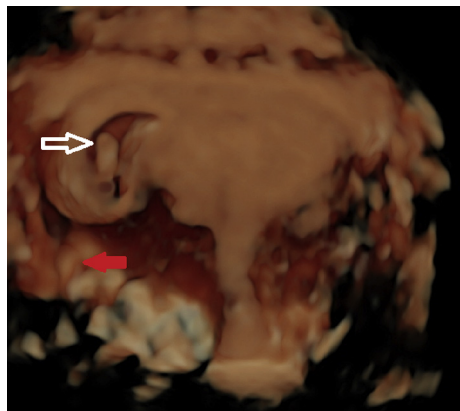


Figure 2. Three-dimensional high-definition live rendered image of the right interstitial ectopic pregnancy. The white hollow arrow indicates the ectopic pregnancy. The red arrow indicates the right fimbria end and ovary.

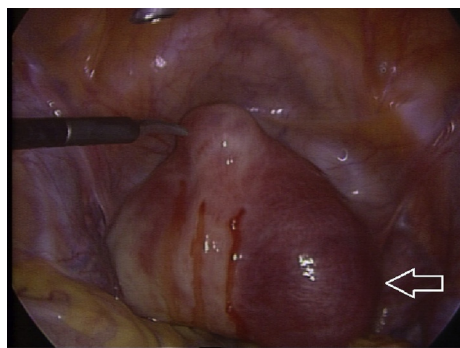


Figure 3. The ectopic pregnancy is visible at the right cornus of the uterus under the laparoscope (hollow arrow).

method we use depends on the beta-human chorionic gonadotropin levels and imaging results. Transvaginal ultrasound is the most useful technique to locate an ectopic pregnancy. However, when an unusual ectopic site occurs, imaging using transvaginal ultrasound becomes a challenge. In this patient, we focused on the image study to diagnose the interstitial pregnancy.

Interstitial pregnancy accounts for approximately 1–3% of ectopic pregnancies [1,2]. In an interstitial pregnancy, the embryo is implanted at the proximal site of the fallopian tube, which is embedded within the muscular wall of the uterus. This site is a

highly vascular area near the anastomosis of the ascending uterine and tubo-ovarian vessels [3]. A diagnosis usually is delayed because of the unique position. The maternal mortality rate is 2.0–2.5% because of misdiagnosis of the intrauterine pregnancy. Traditional transvaginal ultrasound used to diagnose interstitial pregnancy would detect the products of conception in the upper lateral aspect of the uterus, outside the uterine cavity, and at least partially surrounded by the endometrium. The proximal interstitial segment of the tube joining the uterus to the ectopic pregnancy may be visualized (i.e., interstitial line) [4]. The GS is surrounded by a thin (i.e., <5 mm) myometrium and is close to the uterine serosa. The interstitial line is more useful than an eccentric sac location or myometrial thinning [5]. Not every interstitial pregnancy would present the classic characteristics under traditional transvaginal ultrasound. Therefore, a new ultrasound technique has been developed to diagnose interstitial pregnancy using 3D sonography and four-dimensional volume contrast imaging [3]. In this case report, we used a 3D HD live rendering image to identify the relative location of the GS and endometrium. The 3D HD live technique was achieved by the use of Voluson E8 expert ultrasound equipment (General Electric Medical Systems, Kretztechnik, Zipf, Austria). The 3D HD live rendering image of the embryo seems to be more readily discernible than images obtained using conventional 3D sonography because a 3D HD live rendering image provides a natural and anatomically realistic appearance of the embryo [6]. In this patient, we successfully present the 3D HD live rendering image as a novel method to identify an interstitial pregnancy.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

References

- [1] 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;50:141–4.
- [2] Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril* 1999;72:207–15.
- [3] Chou MM, Tseng JJ, Yi YC, Chen WC, Ho ES. Diagnosis of an interstitial pregnancy using four-dimensional volume contrast imaging. *Am J Obstet Gynecol* 2005;193:1551–3.
- [4] Chudleigh P, Thilaganathan B, editors. *Obstetric ultrasound: how, why and when*. 3rd ed. London, UK: Churchill Livingstone; 2004. p. 56–7.
- [5] Ackerman TE, Levi CS, Dashefsky SM, Holt SC, Lindsay DJ. Interstitial line: sonographic finding in interstitial (cornual) ectopic pregnancy. *Radiology* 1993;189:83–7.
- [6] Zanforlin Filho SM, Araujo Júnior E, Guimarães Filho HA, Pires CR, Nardozza LMM, Moron AF. Sonoembryology by three-dimensional ultrasonography: pictorial essay. *Arch Gynecol Obstet* 2007;276:197–200.