

CASE REPORT

Blue Eye Sign of Ectopic Pregnancy on Transvaginal Sonography Elastography

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ABSTRACT

Sonoelastography is a recent advance in the field of sonography, which has got large number of indications. It is principally used in breast, thyroid, liver, and prostate for diagnosis of malignancy. New indications are also tried in the field of obstetrics and gynecology. We are here reporting a case of ectopic pregnancy, where classical "blue eye sign" is seen on sonoelastography.

Keywords: Blue eye sign, Ectopic pregnancy, Elastography, Transvaginal sonography.

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INTRODUCTION

Ectopic pregnancy accounts for approximately 2% of all pregnancies and a common cause of pregnancy-related mortality in the first trimester of pregnancy.¹ For the diagnosis of ectopic, the transvaginal sonography (TVS) is now considered modality of choice, with overall sensitivity of more than 90%. Changing the approach to the diagnosis of ectopic pregnancy, depending on inability to visualize an intrauterine pregnancy, to one where a positive diagnosis can be made by the visualization of an ectopic mass. It is possible to confirm a diagnosis of an intrauterine pregnancy earlier and at much lower serum human chorionic gonadotropin (hCG) levels with TVS compared with transabdominal sonography.²

CASE REPORT

A 27-year-old lady presented with severe pelvic pain and per vaginal (PV) bleeding and was referred for sonography to rule out ectopic pregnancy. The patient had positive urine pregnancy test. On TVS no intrauterine

gestational sac was seen (Fig. 1). An ill-defined mass lesion was identified in the region of left adnexa situated between uterus and left ovary, containing a corpus luteum cyst. Free fluid was noticed in pouch of Douglas (Fig. 2). On elastography it showed typical "blue eye" sign, which indicated that there was stiff tissue in the left adnexal mass, which was confirmed at surgery (Fig. 3).

DISCUSSION

Conventional sonography can differentiate between solid and cystic lesions but cannot differentiate between elasticity of tissues, whereas elastography can perform virtual palpation of lesions. Strain elastography and shear wave elastography techniques are available in various machines.

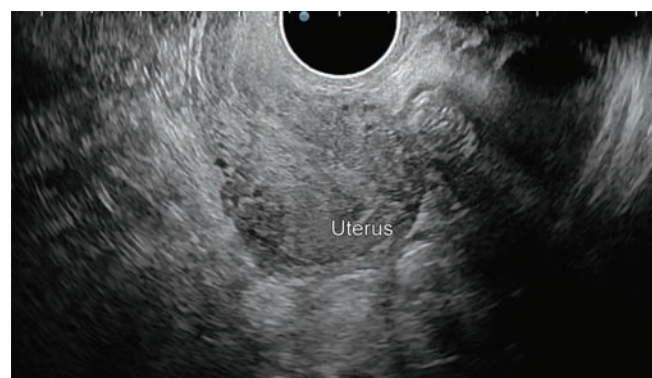


Fig. 1: Transvaginal sonography ultrasonography showing no gestational sac in uterus



Fig. 2: Abdominal ultrasonography showing free fluid in pouch of Douglas

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Fig. 3: Transvaginal sonography ultrasonography showing left adnexal mass adjacent to corpus luteum cyst of left ovary

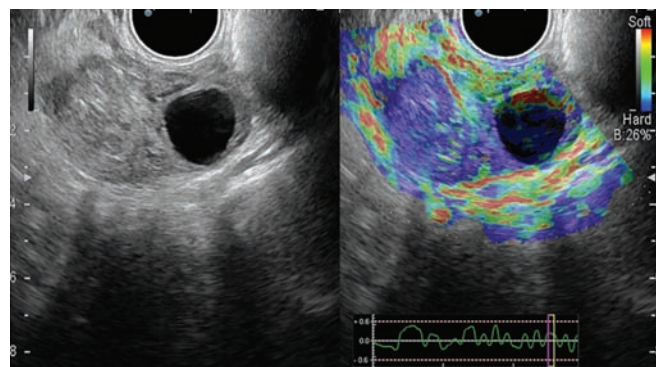


Fig. 4: Transvaginal sonography elastography showing a classical blue eye sign, indicating stiff tissue in left adnexal mass



Fig. 5: Laparoscopic image showing ampullary of fallopian tube ectopic with hematoperitoneum

The physical principle of strain elastography evaluates the relationship between compression and strain, Young's modulus, the ratio of pressure to strain. Strain (or static) elastography requires external palpation with a probe or endogenous stress as cardiovascular movements, resulting in an axial displacement of the tissue by mechanical stress.³ Tissue deformation caused by the stress is measured and visualized in a split-screen mode with a conventional B-mode image and an elastogram on a screen. To acquire the elastographic images, compression is continuously applied by ultrasound transducer and followed by decompression. The elastic image is superimposed on the B-mode image, and tissue stiffness is displayed in a color scale from red denoting soft tissue and blue indicating hard tissue.⁴ Itoh et al³ proposed a grading system in elastography for stiffness assessment. A score of 1 indicates the entire lesion shaded in green color. A score of 2 means a mosaic pattern of green and blue. A score of 3 has strain at the periphery of the hypoechoic lesion, with sparing of the center of the lesion indicated by the peripheral green, and the central blue color. A score of 4 shows no strain in the entire hypoechoic lesion, i.e., the entire lesion was blue not including the surrounding area. A score of 5 means no strain in the entire hypoechoic lesion or in the surrounding area, i.e., both the entire

hypoechoic lesion and its surrounding area were blue. Real-time sonoelastography is a promising additional method in early detection of ectopic pregnancy.⁵ With ectopic pregnancy, the adnexal findings on TVS using current equipment tend to be less advanced as compared to reported 1 to 2 decades ago. Patients are more likely to have a nonspecific adnexal mass than a yolk sac or embryonic heartbeat in the mass, likely because of diagnosis of ectopic pregnancy now done earlier in gestation.⁶ Real-time sonoelastography is a promising additional method in early detection of ectopic pregnancy. The blue eye sign is quite useful in doubtful cases of serum β -hCG levels lower than 1500 IU/mL for detection of extrauterine pregnancy (Fig. 4). The criteria for diagnosing extrauterine pregnancy with the help of sonoelastography in patients with increased β -hCG level are focal changes in elasticity in the tubal, peritubal, or latero-uterine region in the form of stable oval or round-shaped structure of increased elasticity (Stiff tissue blue in color) mostly on the side of the corpus luteum.⁵ Elastography is now used in the evaluation of various adnexal masses. Transvaginal real-time ultrasonographic elastography has potential role in the differential diagnosis of cystic ovarian lesions and this technique can be used in differentiation of the benign lesions from those of malignant⁷ and now its role is being evaluated in other pelvic masses like uterine fibroids⁸ and polycystic ovary (Fig. 5).⁹

CONCLUSION

In cases of ectopic pregnancy at times ultrasonography (USG) findings can be nonspecific and negative. If sonoelastography is added to TVS sonography, diagnostic accuracy is improved for better patient management.

REFERENCES

1. Lin EP, Bhatt S, Dogra VS. Diagnostic clues to ectopic pregnancy. *Radiographics* 2008 Oct;28(6):1661-1671.
2. Kirk E, Bourne T. Diagnosis of ectopic pregnancy with ultrasound. *Best Pract Res Clin Obstet Gynaecol* 2009 Aug;23(4):501-508.



3. Itoh A, Ueno E, Tohno E, Kamma H, Takahashi H, Shiina T, Yamakawa M, Matsumura T. Breast disease: clinical application of US elastography for diagnosis. *Radiology* 2006 May;239(2):341-350.
4. Kwak JY, Kim EK. Ultrasound elastography for thyroid nodules: recent advances. *Ultrasonography* 2014 Apr;33(2):75-82.
5. Gazhonova V, Churkina S, Zubarev A. Real-time sonoelastography improved early detection of ectopic pregnancy. Poster No.: C-1203. Congress: ECR 2010. Scientific Exhibit. Moscow, Russia: European Society of Radiology. Available from: www.myESR.org.
6. Frates MC, Doubilet PM, Peters HE, Benson CB. Adnexal sonographic findings in ectopic pregnancy and their correlation with tubal rupture and human chorionic gonadotropin levels. *J Ultrasound Med* 2014 Apr;33(4):697-703.
7. Ciledag N, Arda K, Aktas E, Aribas BK. A pilot study on real-time transvaginal ultrasonographic elastography of cystic ovarian lesions. *Indian J Med Res* 2013 Jun;137(6):1089-1092.
8. Ami O, Lamazou F, Mabile M, Levaillant JM, Deffieux X, Frydman R, Musset D. Real-time transvaginal elastosonography of uterine fibroids. *Ultrasound Obstet Gynecol* 2009 Oct;34(4):486-488.
9. Çıracı S, Tan S, Özcan AŞ, Aslan A, Keskin HL, Ateş ÖF, Akçay Y, Arslan H. Contribution of real-time elastography in diagnosis of polycystic ovary syndrome. *Diagn Interv Radiol* 2015 Mar-Apr;21(2):118-122.