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## **Three Dimensional Ultrasound and Power Doppler in Assessment of Uterine and Ovarian Angiogenesis: a Prospective Study**

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**Aim.** To determine whether three-dimensional power Doppler can improve the recognition of pelvic tumor morphology and angiogenesis.

**Methods.** Using this technique we analyzed 180 adnexal masses and 110 uterine lesions. Tumor volume, morphology, and vascularity were evaluated in each patient. Irregular and randomly dispersed vessels with complex branching depicted by comprehensive three dimensional display were suggestive of pelvic malignancy, while linear-like vascular morphology, single vessel arrangement and regular branching were typical for benign structures.

**Results.** Addition of qualitative analysis of vascular architecture of adnexal tumor to morphological parameters reached 96.15% sensitivity and 98.73% specificity. When endometrial lesions were prospectively analyzed, sensitivity and specificity were 91.67% and 98.49%, respectively. Because the lowest positive predictive value of 16.67% was obtained for myometrial lesions, this method should not be advised for their evaluation.

**Conclusion.** Good results achieved by three dimensional ultrasound can be explained by improved recognition of the pelvic lesion anatomy, characterization of the surface features, detection of the tumor infiltration, and precise depiction of the size and volume. Three dimensional power Doppler imaging can detect structural abnormalities of the malignant tumor vessels, such as arteriovenous shunts, microaneurysms, tumoral lakes, disproportional calibration, coiling, and dichotomous branching. Therefore it enhances and facilitates the morphologic and functional evaluation of both benign and malignant pelvic tumors.

**Key words:** adnexa uteri; angiography; angiogenesis, physiologic; neovascularization, physiologic; ovary; vasodilatation; ultrasonography, Doppler, color; ultrasonography, prenatal