INTRODUCTION

Adnexal masses present a special diagnostic challenge, in part because benign adnexal masses greatly outnumber malignant ones. Determination of a degree of suspicion for malignancy is critical and is based largely on imaging appearance. **(1)**

Ovarian cancer is the second most common gynecologic malignancy; however, it remains the leading cause of death among these diseases and is the fourth leading cause of cancer deaths in women in the United States **(2).** In spite of diagnostic and therapeutic advances in the care of women with ovarian cancer, the overall survival is 5-years.Approximately 70% of patients having peritoneal involvement at the time of diagnosis. It spreads predominately by direct invasion and intraperitoneal dissemination. **(3)**

Ovarian tumors can be categorized as (a) epithelial, (b) germ cell,(c) sex cord–stromal, or(d) metastatic. Epithelial tumors are the most common histopathologic type of malignant ovarian tumor (85% of cases) **(4،5).** Subtypes of epithelial tumors include serous, mucinous, endometrioid, clear cell, and Brenner tumors. Epithelial tumors are rare before puberty; their prevalence increases with age and peaks in the 6th and 7th decades of life. **(4)** The most common type of ovarian malignancy is serous carcinoma (approximately 40% of cases) **(4,6,7,8).** Therefore, it is important to be familiar with the clinical and imaging aspects of ovarian epithelial tumors in particular.

Endovaginal ultrasonography (US) is the most practical modality for assessment of ovarian tumors because it is readily available and has a high negative predictive value. Morphologic analysis of adnexal masses is accurate for identifying masses as either low risk or high risk. The most important morphologic features are non-fatty solid (vascularized) tissue, thick septa, and papillary projections. Color Doppler US helps identify solid, vascularized components in a mass. Spectral Doppler waveform characteristics (e.g., resistive index, pulsatility index) correlate well with malignancy but generally add little information to morphologic considerations**. (1)**

Computed tomography can help assess the extent of disease in patients before and after primary cytoreductive surgery. **(1)**

With the advent of endovaginal US, more detection of an adnexal mass is not enough; characterization of that mass by analyzing internal architecture has become important. Application of pulsed and color Doppler flow techniques has further increased the potential for characterization of the vascularity of an adnexal mass. **(9)**

Pelvic MRI has proven to be powerful as an adjunct to pelvic sonography in characterizing adnexal masses as benign **(10, 11).** With its accessibility and high resolution, transvaginal sonography is still the best method for characterizing a lesion as a simple cyst, a complex cyst, or a homogeneously solid mass. However, sonography is limited in its range of tissue characterization and field of view. Although MRI is less accessible and has lower resolution than sonography, it has the benefit of a wide range of tissue specificity and a much larger field of view. MRI can be used to definitively characterize fat, blood, and simple fluid, and the enhancement properties of solid tissues can be measured with the administration of gadolinium. The larger field of view proves useful for characterizing large masses or for evaluating lesion location relative to the ovary in patients with large uterine fibroids when the adnexal anatomy is significantly distorted **(12)**

Magnetic resonance (MR) imaging provides useful information for characterization of various ovarian masses as neoplastic or nonneoplastic and, when neoplastic, on a spectrum from benign to malignant. The use of MR imaging for diagnosis of ovarian masses includes consideration of morphologic characteristics and signal intensity characteristics on T1- and T2-weighted images. The morphologic characteristics of cystic masses, cystic and solid masses, and predominantly solid masses provide important information. In general, cystic masses represent benign tumors, whereas cystic and solid masses are strongly associated with malignancy. Predominantly solid masses include benign, borderline malignant and malignant tumors. T1-weighted images provide useful information for characterization because hemorrhagic adnexal masses (e.g., endometriotic cyst) and cystic teratomas can be correctly

diagnosed when the mass has high signal intensity. Significant low signal intensity in solid masses on T2-weighted images is indicative of fibrothecomas and Brenner tumors because extensive fibrous tissue produces significant low signal intensity on T2-weighted images. A strategy for diagnosis of ovarian masses with MR imaging incorporates signal intensity characteristics into morphologic characteristics. **(13)**