Summary and conclusion

Ovarian tumors are classified as epithelial tumors, germ cell tumors, sex cord–stromal cell tumors, and metastatic tumors on the basis of tumor origin **(158).**

Although ovarian tumors have similar clinical and radiologic features, predominant or specific imaging features may be present in some types of ovarian tumors. Characterization of an ovarian mass is of the most importance in the preoperative evaluation of an ovarian neoplasm. It enables the surgeon to anticipate carcinoma of the ovary before the operation so that adequate procedures can be planned **(159).**

In recent years, surgical laparoscopy has been used to manage benign adnexal masses with minimal surgical morbidity .Therefore, familiarity with the clinical and imaging features of various ovarian tumors is important in determining the likelihood of a tumor being benign or malignant **(160).**

Vascularized tissue and differentiating solid tumor tissue from non-vascularized structure, it is also used in conjunction with other Doppler modalities to identify vessels for wave form analysis. It was found that benign lesions tend to initiate new tumor vessels peripherally whereas malignant tumors tend to initiate new tumor vessels centrally.

2 indices have been used in analysing Doppler waveforms the Pulsatility Index (PI) and Resistive index(RI). Both increase with increasing distal vascular resistance. Resistive index less than 0.4 and pulsatility index less than 1.0 are generally suspicious for malignancy.

Combination of 3D morphological creteria and Doppler wave form analysis affords better evaluation of adnexal masses and over comes problems mimicking malignancy specially in premenepausal women as physiological alteration in ovaries due to menstrual cycle and inflammatory conditions and endometriosis **(109).**

One of the most important roles of MR imaging is in differentiating malignant from benign tumors. MR imaging criteria for malignant ovarian tumors have been

established. A contrast enhanced study is essential because it improves the diagnostic accuracy for ovarian malignancy **(120).**

The primary criteria are :

(a) a solid mass or large solid component,

(b) wall thickness greater than 3 mm,

(c) septal thickness greater than 3mm and/or vegetations or nodularity, and

(d) necrosis.

The ancillary criteria were also formulated as:

(a) involvement of pelvic organs or the sidewall;

(b) peritoneal, mesenteric, or omental disease;

(c) ascites; and

(d) adenopathy.

When these criteria are used, the sensitivity for classifying malignancy is 91%–100% and the specificity is 91%– 92% **(120).**

Magnetic resonance (MR) imaging provides useful information for characterization of various ovarian masses as neoplastic or non neoplasticm 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 (eg, 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).**

Certain radiologic findings predominate for each type of tumor.

- Ovarian tumors associated with endometrial hyperplasia or carcinoma include endometrioid carcinoma, granulosa cell tumor, and, occasionally, thecoma or fibrothecoma.

- Solid ovarian tumors that have very low signal intensity on T2-weighted MR images include fibroma, Brenner tumor, and, occasionally, fibrothecoma.

- The presence of fat opacity or fat signal intensity in an ovarian lesion is highly specific for a teratoma. Mature cystic teratomas are predominantly cystic with dense calcifications, whereas immature teratomas are predominantly solid with small foci of lipid material and scattered calcifications.

- Malignant germ cell tumors include dysgerminoma and endodermal sinus tumors, among others. These are large, predominantly solid masses that are more common in younger women (second and third decades of life). Dysgerminoma may demonstrate prominent fibrovascular septa. Serum tumor markers may be useful in making the diagnosis of malignant germ cell tumor.

- Ovarian tumors with highly enhancing solid portions, although uncommon, include sclerosing stromal tumor, Sertoli-Leydig cell tumor, struma ovarii, and cystadenofibroma.

- Ovarian tumors that are frequently associated with calcifications include serous epithelial tumor, fibrothecoma, mature or immature teratoma, and Brenner tumor

Knowledge of these key imaging features of ovarian tumors may allow a specific diagnosis or substantial narrowing of the differential diagnosis. **(66).**

Conclusion:

Color Doppler Sonograghy is highly accurate for excluding malignancy, but, because of its lower positive predictive value, it may lead to misdiagnosis of some benign lesions as malignant. Further correlative studies in order to realize the limitations of color Doppler sonography in detection of ovarian cancer.

MR imaging is a useful modality for differentiating benign and malignant ovarian tumors, and a specific diagnosis can be made for certain pathologic entities. Morphologic appearance, signal intensity characteristics, and adequate use of intravenous contrast material provide information for arriving at the correct diagnosis.