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Role of sonography in various benign and malignant ovarian neoplasms with grey scale and color doppler

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Abstract
Aim: Evaluation of ovarian masses with B mode ultrasonography and Doppler flow imaging to define various benign and malignant lesions.
Material and Methods: The present hospital based observational study was conducted on 30 patients referred from Gynecology and Surgery department from October 2018 to September 2019.
Results: Out of 30 cases, 27 were diagnosed as Benign, rest 03 were diagnosed as Malignant. Out of 27 benign cases, 12 were Mucinous cystadenoma,09 were Serous cyst adenoma and 06 were Dermoid. The Ovarian-Adnexal Reporting and Data System (ORADS) lexicon for US was published in 2018, providing a standard that includes all descriptors and definitions of the characteristic USG appearance of normal ovaries and ovarian or other adnexal lesions
Conclusion: Using the categories of size, unilocularity or multilocularity, solid components, papillary projections, acoustic shadows and blood flow it is possible to recognize typical cases of each category which results in confident and specific diagnoses of ovarian lesions.

Keywords: ovary, benign lesions, malignant lesions

Introduction

Ultrasonography (US) is the primary imaging modality for identifying and characterizing ovarian masses. US is a relatively simple and noninvasive diagnostic method that provides clinicians with useful information relevant for determining the optimal management strategy for a given patient [1, 2].

Studies showed that Doppler provides no more diagnostic information if compared with morphologic assessment alone but the main advantage of adding Doppler ultrasound is to increase the confidence with which a correct diagnosis is made. It demonstrates abnormal tumor vessels, vessels location and vessels flow [3].

Materials and Method

The present hospital based observational study was conducted on 30 patients referred from Gynecology and Surgery department from October 2018 to September 2019.

- Patients who were clinically suspected to have ovarian masses or asymptomatic patients where ovarian mass was detected incidentally were included in the study.
- We did not include the patients who were on ovulation induction drugs and pregnant ones.
- Using E- CUBE ALPINION USG machine, B mode morphological criteria were used.
- Subsequently, color and pulsed Doppler imaging were performed.
- Spectral Doppler analysis were performed by calculating resistive index (RI) and pulsatility index (PI) values.

Result

- Out of 30 cases, 27 were diagnosed as Benign, rest 03 were diagnosed as Malignant. Out of 27 benign cases, 12 were Mucinous cystadenoma, 09 were Serous cyst adenoma and 06 were Dermoid.

Table 1

Features	No. of cases showing particular feature
Size < 10 cm	27
Unilocular	15
Acoustic shadows	06
Multilocular with smooth inner wall < 10 cm	12
Solid components < 7 mm	13
No blood flow	21
Unilocular with irregular wall < 3 mm	09
Solid appearance with smooth contour	00
Unilocular with 1-3 papillary projections	00
Mild flow	06

Out of 03 malignant cases, 02 were diagnosed Serous cyst adenocarcinoma and 01 was Mucinous cyst adenocarcinoma.

Table 2

Features	No. of cases showing particular feature
Size > 10 cm	03
Ascites	03
At least 4 papillary projections	02
Multilocular with irregular inner wall	02
Strong blood flow	03
Solid with irregular contour	00
Peritoneal nodules	00
Multilocular with solid components	01

Table 3

Spectral Doppler	No. of cases
RI > 0.4 and PI > 1.0	06
RI < 0.4 and PI < 1.0	03

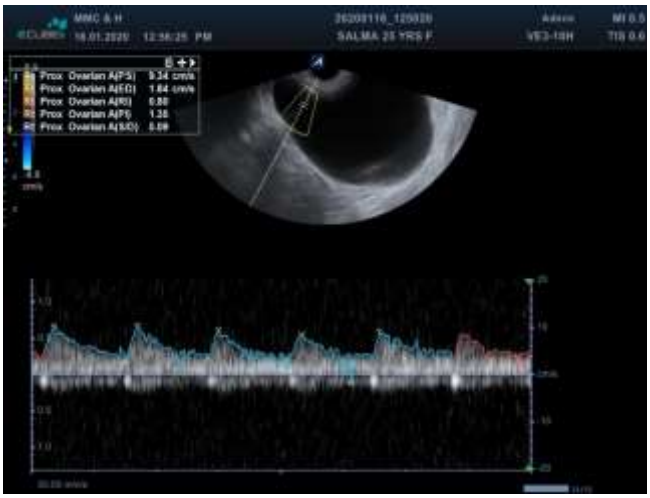

Fig 1

A 25 yrs old patient shows a well-defined bilocular cystic lesion in right adnexa with e/o thin septa with a punctate flow on septa with spectral findings as shown RI>.6 and PI> 1 s/o benign nature.

Fig 2

A 44 yrs old patient shows a large sized ill-defined mixed solid and cystic component with thick septations, irregular contour and central vascularity s/o malignant nature.

Discussion

- Published studies, as well as expert, support the use of pattern recognition by an experienced USG examiner as the most accurate US method of discriminating between benign and malignant adnexal lesions [4-8]
- The Ovarian-Adnexal Reporting and Data System (ORADS) lexicon for US was published in 2018, providing a standard that includes all descriptors and definitions of the characteristic USG appearance of normal ovaries and ovarian or other adnexal lesions
- Out of all the factors, Size was the most reliable factor as all patients who had size > 10 cm were diagnosed as malignant, while all the benign tumors were < 10 cm.

Based on our study, Suspected Benign features were

Unilocular
Acoustic shadows
Multilocular with smooth inner wall < 10 cm
Solid components < 7 mm
No blood flow
Unilocular with irregular wall < 3 mm
Mild flow

Based on our study Suspected Malignant features are

Ascites
At least 4 papillary projections
Multilocular with irregular inner wall
Strong blood flow
Multilocular with solid components
Overall, malignant tumors demonstrated low resistance flow
than benign tumors

The menopausal status was also a significant factor as of all the patients with carcinoma were postmenopausal.
Based on expert opinion, the O-RADS USG working group defined six categories for risk classification. These include
O-RADS 0, an incomplete evaluation
O-RADS 1, the physiologic category (normal premenopausal ovary)
O-RADS 2, the almost certainly benign category (1% risk of malignancy)
O-RADS 3, lesions with low risk of malignancy (1% to 10%)
O-RADS 4, lesions with intermediate risk of malignancy (10% to 50%) and
O-RADS 5, lesions with high risk of malignancy (50%).
In our study, number of cases falling in ORAD category 2 are 06, category 3 are 21 and category 5 are 03.

Therefore, the combination of morphological analysis and Doppler measurements resulted in better diagnosis.

Conclusion

- The accurate characterization of ovarian masses is a common challenge in clinical practice.
- The morphological features described in our study can be acquired without difficulty by anyone who performs gynecological USG examinations on a regular basis.
- Using the categories of size, unilocularity or multilocularity, solid components, papillary projections, acoustic shadows and blood flow it is possible to recognize typical cases of each category which results in confident and specific diagnoses of ovarian lesions.
- USG with color Doppler is a useful tool in differentiating ovarian masses of benign and malignant nature.

References

1. Timmerman D, Schwarzler P, Collins WP, Claerhout F, Coenen M, Amant F, et al. Subjective assessment of adnexal masses with the Use of ultrasonography: an analysis of interobserver variability and experience. Ultrasound Obstet Gynecol, 1999; 13:11-6.
2. Valentin L. Prospective cross-validation of Doppler ultrasound examination and gray-scale ultrasound imaging for discrimination of benign and malignant pelvic masses. Ultrasound Obstet Gynecol, 1999; 14:273-83.
3. Rumack Carol M, Levine Deborah. Diagnostic Ultrasound 5th edition, 2015; 2:578-79.
4. Levine D, Brown DL, Andreotti RF, et al. Management of asymptomatic ovarian and other adnexal cysts imaged at US: Society of Radiologists in Ultrasound Consensus Conference Statement. Radiology. 2010; 256(3):943-954.
5. Froyman W, Wynants L, Landolfo C, et al. Validation of the Performance of International Ovarian Tumor Analysis (IOTA) Methods in the Diagnosis of Early Stage Ovarian Cancer in a Non-Screening Population. Diagnostics (Basel). 2017; 7(2):E32.
6. Valentin L, Hagen B, Tingulstad S, Eik-Nes S. Comparison of 'pattern recognition' and logistic regression models for discrimination between benign and malignant pelvic masses: a prospective cross validation. Ultrasound Obstet Gynecol. 2001; 18(4):357-365.
7. Timmerman D. The use of mathematical models to evaluate pelvic masses; can they beat an expert operator? Best Pract Res Clin Obstet Gynaecol. 2004; 18(1):91-104.
8. Meys EM, Kaijser J, Kruitwagen RF, et al. Subjective assessment versus ultrasound models to diagnose ovarian cancer: A systematic review and meta-analysis. Eur J Cancer, 2016; 58:17-29.