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Role of ultrasound in evaluation of ovarian lesions and its correlation with histopathological findings

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Abstract---Introduction: Ovarian lesions are the most common pathology in gynaecology. They present with pelvic pain, menstrual abnormalities. Sonography is non-invasive, radiation-free, cost effective and widely available. The characterization of ovarian masses and distinguishing between benign and malignant pathology is of utmost importance to enable decisions regarding optimal treatment. Material And Methods: A prospective study was done in a sample of 100 patients suspected of having ovarian lesions on the basis of history and clinical examination. All the patients were subjected to transabdominal sonography with full bladder technique using 3.5 - 5.5 MHz curvilinear transducer and 10 MHz linear transducer. TVS was performed whenever required to obtain additional findings. Histopathological findings were correlated with the findings on sonography. Results: A total of 100 patients with clinically suspected ovarian pathology were examined by ultrasound and histopathological comparison was done. Out of 70 patients with benign lesions, 66 patients were correctly diagnosed on ultrasonography (94%). Out of total 30 patients with malignant tumours, 26 (87%) patients were correctly diagnosed on ultrasonography. Conclusion: The present

study evaluates ovarian mass by USG considering histopathological examination of post operative specimen as gold standard. Diagnostic accuracy increased when USG along with Doppler is combined for evaluation of morphological characteristics of ovarian lesions. USG can be used even by a basic examiner to differentiate benign and malignant ovarian tumour which helps us in making decision regarding further management.

Keywords--ovarian lesions, histopathological, ovarian tumour.

Introduction

Ovarian lesions are the most common pathology in gynaecology. They present with pelvic pain, menstrual abnormalities or can be an incidental finding on pelvic examination or pelvic imaging. Ovarian cancer is the fifth leading cause of cancer death among women and represents approximately 25% of all gynaecologic malignancies. Ovarian cancer has the highest mortality rate of all gynaecological malignancies. Ovaries are subjected to monthly endocrine and traumatic insult during ovulation cycle and are prime site for tumour genesis. Most tumors of the ovary can be placed into three major categories - surface epithelial- stromal tumors, sex cord- stromal tumors and germ cell tumors

Ultrasonography plays a significant role in evaluating ovarian pathology. Sonography is widely accepted as the primary radiological investigation for suspected ovarian pathology. Sonography is non-invasive, radiation-free, cost effective and widely available. Transabdominal (TA) and transvaginal (TV) ultrasound are the most commonly used approaches for performing pelvic ultrasound.

The characterization of ovarian masses and distinguishing between benign and malignant pathology is of utmost importance to enable decisions regarding optimal treatment. In order to predict the nature of ovarian lesion, a number of morphological features are used such as external contour, the presence of solid elements, thickness of septations, papillary projections or nodules along the inner wall, calcification and vascularity.

Aims and objectives

- To detect and evaluate benign and malignant ovarian lesions.
- To correlate between ultrasound and histopathological findings

Inclusion criteria

- Patients of age group 18-60 years were included.
- Patients referred to the radiology department of Dhiraj hospital with clinically suspected ovarian lesions
- All accidentally diagnosed cases of ovarian lesions were also to be included in this study.

Exclusion criteria

- patients with age less than 18 years and more than 60 years.
- patients previously operated for ovarian lesions

Methods

A prospective study was done in a sample of 100 patients suspected of having ovarian lesions on the basis of history and clinical examination. Ultrasonography was performed using GE LOGIQ P9 machine. All the patients were subjected to transabdominal sonography with full bladder technique using 3.5 - 5.5 MHz curvilinear transducer and 10 MHz linear transducer. Following grey scale scanning, color doppler technique was used to assess intralesional vascularity. TVS was performed whenever required to obtain additional findings. For TVS, informed consent was taken and procedure was explained to the patient. The examination was performed with empty bladder in supine position in the presence of female attendant. Histopathological findings were correlated with the findings on sonography.

Results

The study was carried out at department of diagnosis at Dhiraj hospital from october 2021 to March 2022. A total of 100 patients with clinically suspected ovarian pathology were examined by ultrasound and histopathological comparison was done.

Table 1. Final radiological diagnosis of benign lesions

Type of lesion	No. of cases	Percentage
Hemorrhagic cyst	14	20 %
Serous cystadenoma	12	17 %
Mucinous cystadenoma	10	14 %
Simple cyst	10	14 %
Mature cystic teratoma	8	11 %
Tuboovarian abscess	6	8 %
Endometrioma	6	8 %
Theca lutein cyst	4	5 %

Table 2. Final radiological diagnosis of malignant lesions

Type of lesion	No. Of cases	Percentage
Serous Cystadenocarcinoma	14	46 %
Mucinous cystadenocarcinoma	12	40 %
Ovarian metastasis	4	13 %
Fibroma	2	6 %

In the study, 70 lesions were identified as benign lesions and 30 lesions were identified as malignant

Findings on USG

	Benign	Malignant
External contour - Smooth	64	2
Irregular	6	28
Inner septations	20	24
Inner wall margins- Smooth	60	2
Irregular (including papillary projections)0	10	28
Vascularity present	7	30
Vascularity absent	63	0

Comparison of Pathological diagnosis and US findings

Histopathological diagnosis	No.of lesions	Correctly diagnosed at US
Benign	70	66 (94 %)
malignant	30	26 (87 %)

Discussion

Ovarian cancer is one of the most common gynaecological malignancies in India and worldwide. However, it has the highest mortality among all gynaecologic malignancies. The major reason for the poor prognosis is that, at the time of diagnosis, approximately 75% of patients have diseases that are at an advanced stage. The early detection of ovarian carcinoma continues to be a formidable challenge and an elusive task.

When an ovarian mass is detected, there are two major issues: to determine whether it is benign or malignant and then if it is malignant, to look for the extent of disease. Precise characterization of the lesion is important. Because of the obvious significant differences in prognoses between early and advanced cancers, early detection with accurate staging is of paramount importance. On USG all masses were assessed on the basis of their morphologic characteristics. Well defined anechoic lesions are more likely to be benign whereas lesion with irregular walls, thick irregular septation, mural nodularity and solids echogenic elements favour malignancy.

In the study, 70 lesions were identified as benign lesions and 30 lesions were identified as malignant. Ultrasonography has a high positive predictive value in detecting benign and malignant lesions. Out of 70 patients with benign lesions, 66 patients were correctly diagnosed on ultrasonography (94%). Out of total 30 patients with malignant tumours, 26 (87%) patients were correctly diagnosed on ultrasonography.

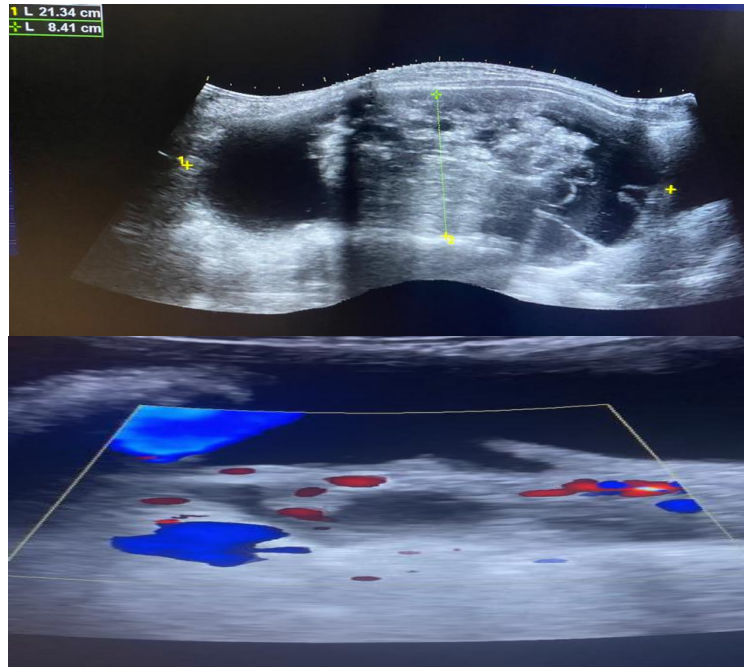
Individual pathologies

Figure 1. Mucinous cystadenocarcinoma- multilocular cystic lesion in left ovary with low level internal echoes, thick depositions, papillary projections and solid components



Figure 2 . Large homogeneously hypoechoic mass in left adnexa corresponding to ovarian fibroma



Figure 3 . Dermoid cyst/ cystic teratoma with a dermoid mesh with multiple hyperechogenic interfaces in a cystic mass in right ovary

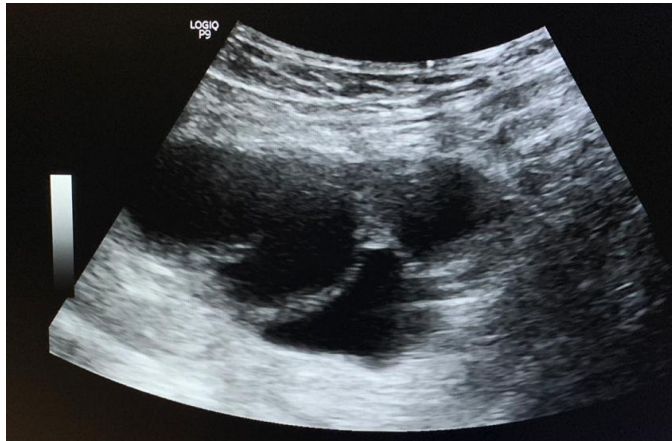


Figure 4.Theca lutein cyst



Figure 5. Serous Cystadenofibroma- anechoic cystic lesion with thin internal septations, clear fluid and no flow detected on Color doppler

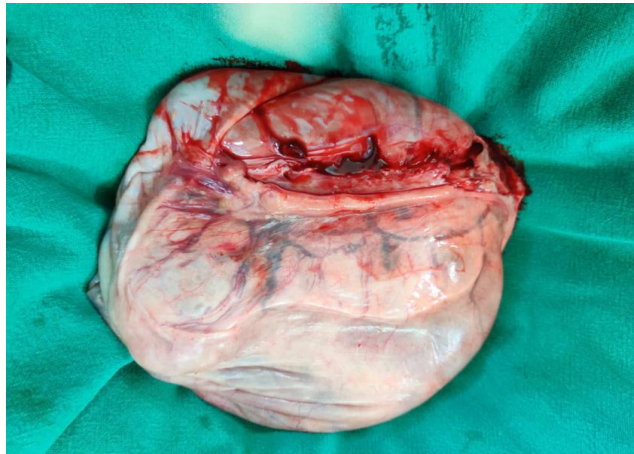


Figure 6- Post operative specimen of mucinous cystadenocarcinoma

Conclusion

The present study evaluates ovarian mass by USG considering histopathological examination of post operative specimen as gold standard. Diagnostic accuracy increased when USG along with Doppler is combined for evaluation of morphological characteristics of ovarian lesions. USG can be used even by a basic examiner to differentiate benign and malignant ovarian tumour which helps us in making decision regarding further management.

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