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ULTRASONOGRAPHIC EVALUATION OF ADNEXAL MASSES

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ABSTRACT

Adnexal mass lesions are very common among women of all age group but very common among reproductive age. Differential diagnosis of adnexal mass is difficult and complex. Recognition of the severity of the problem, appropriate and timely evaluation and treatment with good outcome is the goal. Ultrasound is the primary modality used for detection and characterization of adnexal masses. The purpose of this study is to evaluate the diagnostic accuracy of ultrasonography in patients suspected with adnexal masses. The study was conducted on 30 patients with suspected various adnexal masses in a period of 2yrs from 2005-2007. After taking consent, all patients underwent TAS and TVS. Sassone scoring system was applied. All patients later underwent laparotomy. Results of ultrasound were correlated with operative and histopathological findings. The sensitivity, specificity, positive predictive value and negative predictive value of Sassone scoring system to differentiate benign from malignant masses were 100%, 97%, 75% and 100% respectively. Sassone sonographic scoring system is a reliable scoring system to differentiate between benign and malignant tumor. Sonography can be used as a simple noninvasive effective primary tool in evaluation of adnexal masses.

INTRODUCTION

Adnexal mass is common among all age groups but very common among women of reproductive age. Differential diagnosis of adnexal mass is difficult and complex. Adnexal mass may be of gynecological or non-gynecological origin.

An adnexal mass may be benign or malignant. It is the risk of malignancy that propels us for early, accurate and prompt diagnosis to lessen the mortality and morbidity. An adnexal mass often involves ovary, because of the propensity of the ovary for neoplasia, fewer neoplasm occur in the fallopian tube which is commonly involved in inflammatory process.

The diagnosis of ovarian tumors is based on clinical examination, sonography and measurements of CA-125 collectively known as triple diagnostic method [1].

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Ovarian cancer is the commonest cause of death from gynecologic malignancy, and is the fifth commonest cause of cancer deaths in women [2]. Ultrasound is the primary modality used for detection and characterization of adnexal masses.[3] with the development of sonography including Doppler study it is possible to make early and more specific pre and intraoperative evaluation of adnexal mass and to develop individual strategies of adnexal mass and avoid unnecessary interventions. Sonography is invaluable; it is most effective image producing procedure available today. Transvaginal sonography provides better portrayal of adnexal masses as compared to transabdominal sonography.

The advantage of TAS lies in over all images in detection of some larger and externally located tumor, which would escape detection by TVS. However, TAS and TVS should be used together to detect or exclude any adnexal mass. Even after using sonography and color evaluation, histopathology after laparotomy is taken as gold standard for evaluation of benign and malignant adnexal masses.

METHODOLOGY

In the 2year study period 30 cases were selected for this study. The cases were recruited from the teaching hospitals.

The women underwent ultrasound only if they met the following criteria:

Inclusion criteria:

TAS and TVS shall be conducted in

a. Clinically suspected cases of adnexal masses.

b. Incidentally found adnexal masses when patient is undergoing sonography.

Exclusion criteria:

a. Unmarried female patients (since TVS is contraindicated)

b. Pediatric patients (< 15 years)

All eligible patients were properly counseled and gave informed consent before entry into the study.

Detailed menstrual, obstetric and medical histories of each patient were taken and general, physical, systemic and gynecological examination was done. Relevant investigations were done according to clinical findings.

All of them were subjected to transabdominal ultrasonography with full bladder technique with 3.5MHz probe and then transvaginal sonogrpahy with empty bladder technique with 6.5MHz.

Initially the patients were evaluated with an abdominal transducer to evaluate potential pathologic conditions outside the focal length of the vaginal transducer.

For transvaginal scan, transducer was prepared for use by first applying standard coupling gel followed by a condom which was again lubricated with coupling gel before insertion. The transducer was introduced into posterior vaginal fornix when uterus was retroverted and into anterior vaginal fornix when it was anteverted.

Complete pelvic survey was performed. Observations included size, shape and echotexture of the adnexal masses in sagittal and transverse planes. Sassone scoring system was applied to differentiate benign and malignant ovarian tumors. This scoring system takes into account for the inner wall structure, wall thickness, septa and echogenicity giving a scoring ranging from 4-15.

The final diagnosis was made by histopathologic examination following total abdominal hysterectomy or biopsy. All pathology reports were reviewed. The findings of sonography were correlated with histologic findings, which were taken as gold standard.

Statistical analysis:

Results are expressed as mean ± SD and proportions as percentages. Diagnostic validity tests were performed to assess the diagnostic value of sonographic and clinical diagnosis.

RESULTS

Table 1. Age Distribution

Age group (in yrs)	No. of cases	Percentage
16-25	5	16.7
26-35	14	46.7
36-45	4	13.3
46-55	5	16.7
56-65	1	3.3
66-75	1	3.3
Total	30	100

The patient ages ranged from 18 to 75 with a mean age of 37.1yrs

In the present study the majority of cases were from the age group 26-35yrs. 5 patients were below 25yrs.

Table 2. Clinical Features

Clinical features	No. of cases	Percentage
Mass PA	24	80
Pain	17	56.7
Backache	1	3.3
Discharge	2	6.7
Loss of wt.	1	3.3
Amenorrhea	8	26.7
Menstrual cycles		
Regular	21	70
Irregular	1	3.3

Majority of patients had multiple symptoms.

Most of them presented with H/0 lump in the abdomen (80%) followed by pain abdomen (57%).

Table 3. Clinical Diagnosis

Clinical diagnosis	No. of cases	Percentage
Fibroid	8	26.7
Pelvic mass	4	13.3
PID	9	30
Rt. Ovarian cyst	7	23.3
Rt. Ovarian malignancy	2	6.6
Total	30	100

Patients referred to ultrasonography with a provisional diagnosis of fibroid, PID etc.

Table 4. USG Site

Site	No. of cases	Percentage
Rt. Adnexa	27	90
Bilateral Adnexa	1	3.3
Lt. Adnexa	2	6.7
Total	30	100

Commonest location of adnexal masses was right adnexa (90%). Bilateral in only 3%of cases.

Table 5. USG Size

Size (In cms.)	Benign	Malignant
5-9	19(70%)	1(3.3%)
10-14	5(18.5%)	2(66.6%)
>15	3(11.5%)	0

Mean size ± SD 9.1cms ± 4.8
Range3x5-24x22(Min-max)
Patients were categorized according to sonographic size in different groups from 5cm to more than 15cms
63.3% of benign masses were 5-9cms in size as compared to 3.3% of malignant masses
5 patients out of 27 (19%) benign masses were of size 10-14 cms as compared to 67% of malignant masses.
Only 11.5% of benign masses were more than 15 cms.

Table 6. Sassone Sonographic Score for Benign and Malignant Tumor

Score	Benign (n=27)	Malignant (n=3)
4	19(70.3%)	0
5	4(14.8%)	0
6	1(3.7%)	0
7	3(25.9%)	0
8	0	0
9	0	0
10	0	0
11	0	2(66.6%)
12	0	1(3.3%)

Adnexal masses were grouped according to the sonographic score varying from four to more than 11. None of the malignant masses had score between 4-10, 2 out of 3 malignant masses had score 10 and 1 had score 12. Only 3 patients out of 27 benign masses had sonographic score of nine.

Table 7. Wall Thickness - Score

Wall thickness - Score	Benign(27)	Malignant(3)
Thin (<3mm)-1	25(92.5%)	0
Thick (>3mm)-2	2(7.4%)	0
Solid-3	0	3(100%)

Wall thickness <3mm was seen in 92.5% of benign masses but none in malignant masses
Thick wall was seen in only 7.4% of benign masses.
Solid wall was seen in all malignant masses

Table 8. Inner Wall Structure - Score

Inner wall structure - Score	Benign(27)	Malignant(3)
Smooth-1	22(81.5%)	0
Irregular-2	5(18.5%)	0
Papillaries-3	0	0
Solid-4	0	3(100%)

None of the benign adnexal masses had score 3 or 4 for inner wall structure but it was seen in all malignant masses.
Only 18.5% of benign masses had irregular inner wall structure

Table 9. Septation-Score

Septation - Score	Benign (n = 27)	Malignant (n = 3)
No septa-1	24(88.8%)	0
Thin(<3mm)-2	3(11.2%)	0
Thick(>3mm)-3	-	3(100%)

Septa was absent in 88.8% of benign masses but none in malignant masses.
Thin septa was seen in 11.2% of benign masses.
Thick septa was seen in all malignant cases.

DISCUSSION

Tumor size had frequently been identified as a risk factor for malignancy. Correlating the sonographic size with malignancy we concluded that most of the tumors less than 9cms were benign (70%) as compared to only 33.3% of malignant masses. Most malignant tumors were more than 10cms.

Anuradha khanna et al concluded that most of the tumors less than 7cm were benign (79.4%) as compared to only 19.4% malignant masses.

Rulin et al [4], said that malignancy was usually seen in large tumors but later in 1989 Feur et al [5] found out that size alone is not a sufficient indicator of malignancy. Following the Sassone scoring system [6] and taking cut-off score of more than 9 as an indicator of malignancy, we got 100% of malignant masses with score more than nine and all the benign masses had score less than nine.

Anuradha Khanna et al [1] found that none of the malignant masses had score between 4-8, 2 out of 41 malignant masses had score 9, 19 score 10, 7 had score 11, and 13 had score between 4-8 and none had score 10 or more. Only two patients out of 209 benign masses had sonographic score of nine.

Zanetta et al [7] also found out that malignant tumor had higher sonographic score than benign masses. To calculate sonographic score, certain sonographic features like inner wall structure, wall thickness, septa and echogenicity were studied and scoring was done for each sonographic feature.

None of the malignant masses had smooth surface on the inner wall as compared to 81.55% of benign masses. All malignant tumors had solid areas but any of the benign masses showed these features. In our study none of the benign masses had score 3 or 4 for inner wall structure but it was seen in all malignant masses. Only 18.5% of benign masses had irregular inner wall structure.

Anuradha Khanna et al found out that none of the benign adnexal masses had score 3 or 4 for inner wall structure but it was seen in 175 and 28.8% of malignant masses.In our study wall thickness <3mm was seen in 92.5% of benign masses but none in malignant masses. Thick wall was seen in only 7.4% of benign masses. Solid wall was seen in all malignant masses.

Anuradha Khanna et al found out that wall thickness <3mm was seen in 75% of benign masses but none in malignant masses. Thick and solid wall was seen in 73.1% and 26.8% of malignant masses but only in 24.8% and 0% of benign masses respectively.

Granberg et al [8], found 95% and 70% malignancy in tumors with papillary excrescence and solid components. Zanetta et al [7] also found out that malignancy is associated with masses with thick wall and solid areas.In our study, all tumors with solid components were malignant.

CONCLUSION

Thus ultrasound is the main diagnostic imaging modality prior to treatment. Improved detection and characterization of ovarian tumor contributes to better diagnostic accuracy and consequently reduction of false-positive findings and invasive procedures, which leads to a significant reduction of morbidity and mortality from ovarian cancer.

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CONFLICT OF INTEREST: The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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