

Evaluation of Adnexal Masses and its Diagnostic Value of Clinical Findings, Ultrasonography and its Correlation with Histopathological Diagnosis

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Abstract

Objective: Adnexal masses is a common clinical presentation in gynaecological practice and can be of gynaecological or non- gynecologic origin. it includes masses arising from ovaries, fallopian tubes, broad ligament and structures within broad ligament that are developed from the embryonic nests. the term adnexal mass is most often used for masses involving the ovary because of high propensity of the ovary for neoplasia. Therefore, gynecologist must evaluate these masses using clinical and radiological information and the balance the risk of surgical intervention for a benign vs malignant process. the objective of this study is to find out the diagnostic value of the clinical findings, ultrasonography and its correlation with histopathological diagnosis in adnexal masses.

Methods: This is a prospective study undertaken in the department of obstetrics and gynaecology Mysore medical College and research institute Mysore from 7/12/2020 to 11/12/2021, All patients with clinical diagnosis all of adnexal masses where included. After a detailed history, complete general physical examination and bimanual examination a provisional diagnosis was made. The patient was then subjected to an ultrasound examination consisting of at the trans vaginal or transabdominal routes with colour Doppler in selective cases. Biochemical investigations like CA 125 where done. Risk of malignancy index (RMI) for each tumor was calculated. Following surgery, specimen was sent for histopathological examination and the report were collected with preoperative clinical and imaging findings.

Results: The incidence of undergoing surgical intervention was 5.26 %. The incidence of ovarian masses was 93%. 84% were neoplastic and 16% non-neoplastic. The incidence of malignancy was 9.5%. The mean age of presentation of adnexal masses was 38.11 years with majority of tumors occurring in the age group of 41-50 years. There were highly significant differences amount tumor types (benign, malignant) and menstrual status with malignancy being more prevalent in postmenopausal group. Sensitivity and specificity of clinical diagnosis in discriminating benign and malignant ovarian tumor were 87.5% and 93.47% respectively with an accuracy of 93 %. Sensitivity and specificity of ultrasound examination were 87.5% and 95.65% respectively with an accuracy of 95% which was slightly better than clinical diagnosis. When both clinical and sonological diagnosis were combined the overall sensitivity, specificity, positive and negative predictive value for diagnosis and discriminating

benign neoplasm where 87.5%, 96.7%, 70% and 98.8 8% with a false positive rate of 39% and false negative rate of 1.11 %. Their combined accuracy was 96%. CA 125 as a laboratory test showed a sensitivity of 62.5%, specificity of 84.25% and an accuracy of 82.14%. Risk of malignancy index (RMI) more than 200 showed a sensitivity of 62.5%, specificity of 95.65% and an accuracy of 93 %. Surface epithelial tumor- serous type, was the most common histological finding followed by mucinous type among both benign and malignant neoplasms.

Conclusion: Ovarian masses contribute to a majority of adnexal masses and are a common site for neoplasia. Clinical findings, sonography with Doppler correlates positively with histopathology in early detection of malignancy and its appropriate management.

Keywords: Adnexal mass, clinical, histopathology, ultrasound

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Introduction

Adnexal mass is a common clinical presentation in Gynaecologic practice and can be of Gynaecologic or non-Gynaecologic origin.[1-4] The term adnexa is derived from pleural form of the Latin word meaning “appendage” it includes ovaries, fallopian tubes, broad ligament and structures within broad ligament that are developed from embryonic nests. The term adnexal mass is most often used for masses involving the ovary because of high propensity of the ovary for neoplasia.[5-7] Fewer neoplasms occur in the fallopian tube which are generally involved and inflammatory process. Differential diagnosis of adnexal mass is complex and includes functional cysts , benign and malignant ovarian tumors, paraovarian cysts, tubo-ovarian abscesses, hydrosalpinx, ectopic pregnancies, tubal malignancy, broad ligament fibroid, fimbrial cysts, sigmoid colon or colon distended with gases are feces, pelvic kidney and pregnancy in bicornuate uterus. These masses pose both a diagnostic and management dilemma. The differential diagnosis is extensive, and most masses are benign. Ultrasonography is the primary modality used for detection and characterization of adnexal masses. Sonography including Doppler study are useful to make early and more specific preoperative diagnosis and evaluation of adnexal masses and to develop individual strategies to avoid unnecessary

intervention. [8-10] Many screening algorithms like risk of malignancy algorithm (ROMA) are being actively investigated at the present but there is no sufficient evidence to support the routine use of pelvic ultrasound and CA 125 to screen for ovarian cancers in general population.

Methodology

This prospective study was undertaken in the department of obstetrics and Gynaecology, Mysore medical College, Mysore from 7/12/2020 to 11/12/2021

Inclusion criteria: All patient with clinical diagnosis of adnexal masses during the study period

Exclusion criteria:

- Age less than 15 years
- pregnancy with adnexal masses
- mass arising from an abdominal organ on laparotomy (Non-gynaecological cause)
- patient who does not get operated

Method of collection of data: Detailed history about demographic factors, presenting complaints and menstrual histories were obtained. Complete general physical examination and bimanual examination was performed, and provisional diagnosis was made. An ultrasound examination consisting of either transvaginal or transabdominal

sonography with colour Doppler for suspicious cause of malignancy were done to evaluate the adnexal masses. Sonographic finding regarding size of the adnexal mass, laterality, locularity, solid elements hemorrhage, presence of ascites, evidence of metastasis and Doppler studies with pulsatility and resistance index were assessed. An ultrasound diagnosis was made. Standard laboratory tests consisting of complete hemogram, fasting and postprandial blood sugar, liver and renal function tests, beta HCG (in suspicious of pregnancy) and CA 125 with cutoff value of 35U/ml were taken prior to surgery. RMI for each tumour was calculated. Laparotomy was performed. Following surgery, specimens were sent for

histopathological examination and the reports were correlated with preoperative clinical and imaging findings. Accuracy of clinical and ultrasound diagnosis was assessed. Sensitivity, specificity, negative predictive value and positive predictive value of clinical findings, sonography, CA-125 and RMI in predicting malignancy for each at adnexal mass were noted and tabulated using SPSS for windows (v16).

Results:

Number of cases of adnexal masses with surgical interventions were 100 with incidence of 5.26%. The incidence of ovarian masses was 93%.84% were neoplastic and 16% were non neoplastic. The incidence of malignancy was 9.5%.

Table 1: Age Distribution of Adnexal Masses

AGE GROUP(YRS)	NUMBER OF CASES	%
<20	7	7
21-30	31	31
31-40	21	21
41-50	27	27
51-60	8	8
>60	6	6
TOTAL	100	100

The patient ages ranged from 17 to 80 with a mean age of presentation of adnexal masses being 38.11 years. In the present study, majority of patients (79%) were in

the age group 21-50 yrs. 14% of patients were more than 51yrs of age. Only 7% were below 20yrs of age.

Table 2: Relation between Age of Patients and Malignancy

Age Group		Benign	Malignant	Total
<20	Count	7	0	7
	% of Total	8.3%	0%	8.3%
21-30	Count	22	1	23
	% of Total	26.2%	1.2%	27.4%
31-40	Count	16	0	16
	% of Total	19%	0%	19%
41-50	Count	19	5	24
	% of Total	22.6%	6%	28.6%
51-60	Count	7	1	8
	% of Total	8.3%	1.2%	9.5%
>60	Count	5	1	6
	% of Total	6%	1.2%	7.1%

	Total	Count	76	8	84
		% of Total	90.5%	9.5%	100%

There were no significant differences among tumor types regarding the age ($\chi^2=7.13;F=5;P=0.211$)

Table 3: Clinical Diagnosis

Clinical diagnosis	Frequency	%
Acute abdomen (torsion, haemorrhage)	9	9%
ENDOMETRIOSIS	3	3%
Benign tumors	75	75%
Malignant tumors	13	13%
Total	100	100%

75 cases were clinically diagnosed to be benign tumours, majority being ovarian in origin (97.33%) with 2 cases of broad ligament leiomyomas. Malignancy was diagnosed in 13 cases. 9 cases presented as

acute abdomen with features suggestive of either torsion, haemorrhage or rupture ovarian cyst, majority being torsion in 5 cases. Endometriotic cyst ovary were diagnosed in 3 cases.

Table 4: Ultrasound Diagnosis

Ultrasound Diagnosis	Frequency	%
Acute abdomen	11	11.0%
Endometriosis	5	5%
Benign tumours	73	73%
Malignant tumours	11	11%
Total	100	100%

On ultrasound, 73 cases were diagnosed to be benign tumours out of which 71 were ovarian in origin and 2 arising from the uterus. 2 cases had both fibroid and ovarian tumours. 11 cases were detected to be malignant by usg with doppler studies

showing decreased resistance and pulsatility index within the tumour. 9 cases showed features of either torsion or haemorrhage ovarian cysts, 2 cases with hydrosalpinx and the rest 3 cases diagnosed as endometriotic cyst.

Table 5: Laparotomy Diagnosis

Laparotomy findings	Frequency	%
Acute abdomen	9	9%
Endometriosis	5	5%
Benign tumours	78	78%
Malignant tumours	8	8%
Total	100	100%

On laparotomy, 78 cases were found to be benign tumours out of which 76 cases were of ovarian origin, the other 2 being broad ligament fibroid. 4 cases had both

ovarian tumour and fibroid uterus. 8 cases were found to be malignant ovarian tumours all subjected to staging laparotomy. Majority of tumours were restricted to one ovary with intact capsule with tumour found on surface of ovary.

Only 1 case had ascites with enlarged paraaortic lymph nodes for which lymph nodes sampling was done along with staging laparotomy. Out of the 9 cases that presented as acute abdomen, 5 showed features of haemorrhage, 4 with torsion and 4 cases having both torsion and

haemorrhage into cysts. Most of them were benign tumours presenting as torsion and haemorrhage with only 5 being functional cysts, 4 cases were hydrosalpinx, 2 had unilateral TO mass. 5 cases were found to be endometriotic cysts.

Table 6: Histopathology Types

HPR TYPES	Frequency	%
Serous cystadenoma	36	36.0
Mucinous cystadenoma	18	18.0
Haemorrhagic ovarian cyst	5	5.0
Dermoid cyst	9	9.0
Endometriosis	6	6.0
Hydrosalpinx	4	4.0
Torsion cyst	3	3.0
Serous cystadenocarcinoma	3	3.0
Simple cyst	2	2.0
Leiomyoma	2	2.0
Mucinous cystadenocarcinoma	2	2.0
Squamous cell carcinoma in dermoid	1	1.0
Serous papillary cystadenofibroma	1	1.0
Ovarian fibroma	1	1.0
Papillary seromucinous cystadenocarcinoma	1	1.0
Fimbrial cyst	1	1.0
Seromucinous cystadenoma	1	1.0
Tubo ovarian mass	2	2.0
Yolk sac tumor	1	1.0
Total	100	100.0

In our study, most common histopathological type was serous cystadenoma (36%) followed by mucinous cystadenoma in 18% cases. Other benign tumours consisted of dermoid cyst in 9 cases, leiomyoma in 2 cases and 1 case each of ovarian fibroma and seromucinous (mixed) type. Malignant tumour types included 3 cases of serous type, 2 cases of mucinous variety, 1 case each of seromucinous type, yolk sac

tumour and squamous cell carcinoma arising in a dermoid cyst. Other histological varieties included hemorrhage in 5 cases, torsion in 3 cases, Endometriosis in 6 cases, functional cyst in 2 cases, fimbrial cyst in 1 case, tuboovarian mass in 2 cases showing xanthogranulomatous oophoritis with chronic salpingitis, 4 cases of hydrosalpinx was seen with one case involving both sides.

Table 7: Clinical and Usg Diagnosis Discrepancies in Diagnosis of Adnexal Masses

Clinical diagnosis		USG diagnosis				Total
		Acute abdomen	Endometriosis	Benign	Malignant	
Acute abdomen	Count	8	1	0	0	9
	% of total	8.0%	1.0%	0%	0%	9.0%
Endometriosis	Count	0	3	0	0	3
	% of total	0%	3.0%	0%	0%	3.0%
Benign	Count	3	1	69	2	75
	% of total	3.0%	1.0%	69.0%	2.0%	75.0%
Malignant	Count	0	0	4	9	13
	% of total	0%	0%	4.0%	9.0%	13.0%
Total	Count	11	5	73	11	100
	% of total	11.0%	5.0%	73.0%	11.0%	100.0%

There is an excellent agreement between clinical and ultrasound diagnosis in diagnosing adnexal masses with kappa value 0.742.

Table 8: Clinical and Laparotomy Diagnosis Discrepancies in Diagnosis of Adnexal Masses

Clinical diagnosis		Laparotomy diagnosis				Total
		Acute abdomen	Endometriosis	Benign	Malignant	
Acute abdomen	Count	8	1	0	0	9
	% of total	8.0%	1.0%	0%	0%	9.0%
Endometriosis	Count	0	3	0	0	3
	% of total	0%	3.0%	0%	0%	3.0%
Benign	Count	1	1	71	2	75
	% of total	1.0%	1.0%	71.0%	2.0%	75.0%
Malignant	Count	0	0	7	6	13
	% of total	0%	0%	7.0%	6.0%	13.0%
Total	Count	9	5	78	8	100
	% of total	9.0%	5.0%	78.0%	8.0%	100.0%

There is an excellent agreement between clinical and laparotomy diagnosis in

diagnosing adnexal masses with kappa value 0.696.

Table 9: Clinical and Histopathology Diagnosis Discrepancies in Diagnosis of Adnexal Masses

Clinical diagnosis		HPR REPORT				Total
		Acute abdomen	Endometriosis	Benign	Malignant	
Acute abdomen	Count	8	1	0	0	9
	% of total	8.0%	1.0%	0%	0%	9.0%
Endometriosis	Count	0	3	0	0	3
	% of total	0%	3.0%	0%	0%	3.0%
Benign	Count	2	2	70	1	75
	% of total	2.0%	2.0%	70.0%	1.0%	75.0%
Malignant	Count	0	0	6	7	13
	% of total	0%	0%	6.0%	7.0%	13.0%
Total	Count	10	6	76	8	100
	% of total	10.0%	6.0%	76.0%	8.0%	100.0%

There is an excellent agreement between clinical and laparotomy diagnosis in diagnosing adnexal masses with kappa value 0.706.

Discussion

Ovarian cancer carries the worst prognosis among all gynaecological cancers mainly due to lack of effective screening methods for early detection of the disease. [11] Accurate pre-operative prediction of the benign for malignant nature of an adnexal mass is essential for proper management [11]. In the present study, out of 1899 admissions in the gynaecology ward, Incidence of adnexal masses undergoing surgical intervention was 5.26%. Mean age group of presentation of adnexal masses was 38 years. Mean age of malignant tumor was 45 years which is similar to the other studies done by mondal et al [12] and Wasim et al [13]. Who reported the mean age as 48 and 49.5 years respectively. Result from European studies

shows that the age-specific incidence rate arise sharply from around 40-44 years peaking among women in their 70s and 80s. [15] The number of cases is highest among the women in their 60s and 70s accounting for almost half the diagnosis. [16] Thus the increasing trend of ovarian neoplasms in young age group in our population is noted.

Among the ovarian neoplasms, 90.46% where benign and 9.54% malignant. These findings comparable with Sharda et al., [14] pili et al [17] and jha et al [18] study.

The very fact that a women is in menopause presents a risk that the adnexal mass is of malignant nature. [16] which is confirmed by the result of our study. On the other hand, patients in the reproductive period more often have been benign lesions. This result is seen in similar studies by Dotlic et la [19] and Milan et al. [11] where there were highly significant

difference among tumor types(benign, malignant) regarding menstrual status of examined women with malignant tumors being more frequent in postmenopausal group.

Abdominal pain was the most common presentation in both groups in our study, but was not statistically different, whereas other studies have reported more association with malignant disease. [24] In benign group this would have been due to increased tumor size, ascites, endometriosis and complications of ovarian cyst, as most patient presented late none of our cancer patient with asymptomatic while few other studies have reported 7-15% of over in Cancer patients to be asymptomatic. [25] There is an excellent agreement between clinical, USG and laparotomy diagnosis in diagnosing adnexal masses.

Conclusion

Ovarian masses contribute to a majority of adnexal masses and they are a common site for neoplasia. They manifest a wide spectrum of clinical, morphologic and histopathological features. The role of clinical evaluation in the diagnosis of early malignancy is of limited value and so the need for other diagnostic tools is mandatory. Ultrasonography with doppler has high diagnostic value in diagnosing the nature of ovarian masses and in predicting malignancy. Histopathology is the gold standard for evaluation of benign and malignant adnexal masses. Thus clinical examination in combination with ultrasonography positively correlate with histopathology in early detection of malignancy and its appropriate management.

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corresponding Author (fourth author) Dr. madhusmita sahu were involved in the technical aspect, revision and drafting of the manuscript, final approval of version to be published.

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