

## To Study the Ultrasonographic Color Doppler and CECT Findings of Various Adnexal Masses

Urmila Tripathi<sup>1</sup>, Vaishali Singh<sup>2</sup>, Neelam Raghuwanshi<sup>3</sup>, Niharika Pandey<sup>4</sup>

<sup>1&4</sup>Department of Obstetrics and Gynaecology, G R Medical College and JA Group of Hospitals, Gwalior M.P.

<sup>2&3</sup>Department of Obstetrics and Gynaecology, SRVS Medical College, Shivpuri, M.P.

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Corresponding author: Dr. Niharika Pandey

Conflict of interest: Nil

### Abstract:

**Background & Methods:** The aim of the study is to study the ultrasonographic color doppler and CECT findings of various adnexal masses. Detailed history about presenting complaints and menstrual history was taken. Complete general physical examination, per abdomen and bimanual examination (where permissible) were done to make provisional diagnosis. For further evaluation, USG either TAS or TVS was done with color doppler and CECT for suspicious cases of malignancy was done. Standard laboratory tests consisting of complete hemogram, fasting and postprandial blood sugar, CA125 and other tumor makers, liver and renal function test were done prior to surgery.

**Results:** Out of 100 cases, on USG 59% cases of adnexal masses were heteroechoic and 4% anechoic, 29% cases of adnexal masses were devoid of septations/nodules/locules. 14% cases were having moderate color uptake on color doppler, which is an indicator of malignancy and were subjected to CECT also shows a very fast contrast enhancement. Only 8% cases shows loss of fat plain in pelvic CECT and found indicating metastasis and malignancy which was found same in histopathological examination.

**Conclusion:** Adnexal masses are more commonly encountered in young patients are of benign nature whereas patients with malignant histopathology are mainly older and more often postmenopausal. Many tumor markers in reference to ovarian masses are used in practice to support pre-operative diagnosis. Echogenicity, vascularity, internal structure in USG color doppler and contrast enhancement in CECT helps in metastatic sites, bulk of disease and provide help in making decision that what should be the extent of cytoreduction. Correlation of the lesion location and appearance at imaging with surgical finding is important in assessing the diagnostic accuracy of imaging of adnexal mass.

**Keywords:** ultrasonographic, color Doppler, CECT & adnexal masses.

**Study Design:** Prospective Observational Study.

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### Introduction

The term Adnexa is derived from the Latin word “adnexus” which means “Appendages” [1]. The adnexa of uterus include the ovaries and fallopian tubes. Adnexal mass is a very common clinical presentation in gynaecological practice. Adnexal masses can be ovarian masses and cyst, however, para tubal cyst, hydrosalpinx and other non-ovarian masses are also included(2). Ovarian tumors alone represent two third of patient with adnexal mass. Malignant ovarian tumors are the most common cause of death in women [2].

Approximately 4-24% of adnexal masses in premenopausal women and 39-63% in postmenopausal women are malignant [3]. Because of the risk of malignancy; early, accurate and prompt diagnosis of adnexal mass to decrease the morbidity and mortality is required. The diagnosis

of adnexal masses can be done by combined modalities which include a thorough clinical pelvic examination, radiological imaging and serum CA125 measurements. Pelvic and abdominal ultrasonography can confirm the presence or absence of a suspected pelvic mass [2]. Benign ovarian masses can easily be identified on ultrasonography which not only saves the patient from unnecessary surgery but also reduces patient’s worry [4].

For the lesion confined to pelvis, TVS has superior resolution whereas TAS is more useful in large tumors [5]. The ultrasound with color doppler helps to identify tumor characteristics, the presence of ascites, hydronephrosis, enlarge lymph nodes liver metastasis or an omental cake, surface neovascularisation. However now a days, CECT and

MRI has been used primarily in patients with ovarian malignancies to reveal the stage of tumor, invasion to surrounding structure, response to recurrent disease and also demonstrate tumor response to therapeutic approach.

### Material and Methods

The study was done in the Department of Obstetrics and Gynecology, Kamla Raja Hospital, Gwalior, M.P. The study was conducted with the data collection for a period of two calendar years with effect from November 2019 to June 2021.

### Inclusion Criteria

- Female patients presenting with symptoms like lower abdominal pain menstrual irregularity, palpable masses in abdomen.
- Asymptomatic female patients where adnexal mass detected at the time of routine per abdomen and pelvic examination or at the time of radiological examination.

### Exclusion Criteria

- Women on ovulation induction drugs.

- Masses arising from urinary tract and gastrointestinal tract.
- Non gynecological adnexal masses either on clinical or radiological examination.

### Procedure

Ethical approval was taken from the institutional ethics committee. Informed consent was taken from all subjects willing to participate before enrolling them in study. Detailed history about presenting complaints and menstrual history was taken. Complete general physical examination, per abdomen and bimanual examination (where permissible) were done to make provisional diagnosis. For further evaluation, USG either TAS or TVS was done with color doppler and CECT for suspicious cases of malignancy was done. Standard laboratory tests consisting of complete hemogram, fasting and postprandial blood sugar, CA125 and other tumor makers, liver and renal function test were done prior to surgery.

### Result

**Table 1: Distribution of patients according to Echogenicity of Adnexal Masses in Ultrasonographical finding**

Echogenicity	Number of cases	(%)
Anechoic	4	4%
Hetero-echoic	59	59%
Cystic	37	37%

Out of 100 cases, 59% cases of adnexal masses were found heteroechoic and 4% cases were anechoic. Out of 59 heteroechoic cases, 19 cases were diagnosed as dermoid cyst by ultrasonography as well as surgically and later on confirmed histopathologically.

**Table 2: Distribution of patients according to Presence of Septation / Nodule/ locule in adnexal masses in USG findings**

Presence of Septation / Nodule/ locule	Number of cases	(%)
Septation	17	17%
Nodule	16	16%
Locule	31	31%
Nodule/ Locule	4	4%
Locule/ Septation	2	2%
Septation/ Nodule/ Locule	1	1%

29% cases of adnexal masses were found to be devoid of any septations/nodules/locules.

**Table 3: Distribution of patients according to Vascularity (Color uptake) in Color Doppler findings**

Vascularity in color doppler	Number of cases	(%)
Minimal	30	30%
Peripheral	4	4%
Moderate	14	14%
Absent	52	52%

Out of 100 cases, 52% cases were not showing any color uptake on color doppler and they were found to be simple cyst. As evidence from table 3, 14% cases were having moderate color uptake on color doppler which is an indicator of malignancy and all these 14 cases confirmed malignant on histopathology.

**Table 4: Distribution of patients according to CECT findings**

CECT findings		Number of cases	(%)
Border	Regular	73	73%
	Irregular	27	27%
Contrast enhancement	Present	14	14%
	Absent	86	86%
Presence of Fat plane	Yes	92	92%
	No	8	8%
Lymph Node	Yes	21	21%
	No	79	79%

Out of 100 cases, on CECT 14% cases shows a very fast contrast enhancement indicating metastasis and malignancy which was found same in histopathological examination. Only 8% cases showed loss of fat plain in pelvic CECT, indicating invasion in surrounding structures. Those 8% were from 14 cases with contrast enhancement found malignant on Histopathology.

**Table 5: Distribution of patients according to origin of adnexal masses in radiological imaging**

Radiological imaging	Number of cases	(%)
Ovarian	49	49%
Para ovarian	4	4%
Tubo-ovarian	42	42%
Other	5	5%

Out of 100 cases, maximum 49% were found to be originating from ovaries only, followed by tubo-ovarian origin in 42%. 49 cases originating from

ovary were found to be ovarian cysts, dermoid cysts, ovarian carcinoma during laparotomy and confirmed to be of ovarian origin in histopathology.

## Discussion

Evaluation of the adnexa is an integral part of the gynaecologic examination. As early adnexal disease rarely is symptomatic, the pelvic examination serves as a primary screening method for asymptomatic adnexal disease. An accurate adnexal assessment is even more important in postmenopausal women because of higher incidence of ovarian cancer, often with no early signs and symptoms [6]

All the 100 patients who were provisionally diagnosed as adnexal masses by detailed history, clinical examinations and ultrasonography and CECT undergone surgical procedure; laparotomy. And masses sent for histopathology for confirmation of radiological and surgical diagnosis.

There was one case with false positive diagnosis of paraovarian cyst by ultrasonography, this case was surgically diagnosed as broad ligament myoma, confirmed by histopathological examination. In our study sonography has sensitivity of 98.8% and specificity of 71.4% with an accuracy of 95% for prediction of ovarian cancer which is similar to the study done by Radhamani and Akhila, 2017 [7].

Morley and Barnett, 1970 [8] had shown a 4.88% error in the prediction of cystic lesions. This is comparable to our study. Difficulty in differentiating small pelvic cyst from small fibroids was encountered by them. Chochrane and Thomas, 1974 [9] also have concluded that cysts less than 3 cms, were not detected with any consistency.

According to Walsh et al., 1979 [10] tubo ovarian abscesses should have thick with at least one cystic component associated with loss of tissue planes. In our study 11% cases were found to be tubercular which is similar to the study.

Chapron et al., 1996 [11] concluded that 11% of 228 masses evaluated preoperatively as "high risk" were found not to have features of malignancy during laparoscopy. Almost similar findings were found in our study, 14% out of 100 masses evaluated as "high risk" were found not to have features of malignancy during laparotomy. There was some discrepancies between diagnosis on ultrasound, color doppler, CECT and laparotomy.

## Conclusion

Adnexal masses are more commonly encountered in young patients are of benign nature whereas patients with malignant histopathology are mainly older and more often postmenopausal. Many tumor markers in reference to ovarian masses are used in practice to support pre-operative diagnosis.

Echogenicity, vascularity, internal structure in USG color doppler and contrast enhancement in CECT helps in metastatic sites, bulk of disease and provide help in making decision that what should be the extent of cytoreduction. Correlation of the lesion location and appearance at imaging with surgical finding is important in assessing the diagnostic accuracy of imaging of adnexal mass

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