

## USG versus Histopathological Diagnosis of Ovarian Masses at Tertiary Care Center

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### Abstract

*Introduction:* In ovarian tumours diverse histopathologies are common reflecting the different cell origins of the tumours. Ovarian cancer is the one of the common cancer among females of India and continues to present at an advanced stage.

*Aims and Objectives:* To study USG versus Histopathological diagnosis of ovarian masses at tertiary care center.

*Methodology:* After approval from Institutional ethical committee, this prospective study was conducted at Department of Obstetrics and Gynecology during the period of September 2013 to September 2015 on 100 women who were randomly selected among the women attending the hospital's Obstetrics and Gynecology OPD with: Menstrual irregularities, Pelvic inflammatory disease, chronic pelvic pain, mass per abdomen. Patients underwent transvaginal / transabdominal ultrasound. Initially diagnosis of mass done by sonography later on by histopathology.

*Result:* Ultrasonography suggested that there were 30% cases of PCOS, 21% cases of benign ovarian cyst, 17% cases of benign ovarian tumor and 11% cases were of dermoid cyst, 9% functional cyst, 7% haemorrhagic cyst, 3% chocolate cyst, 2% malignant ovarian tumor. HPE reports found that the most

common mass was serous cyst adenoma 26%, Mucinous cyst adenoma 12%, Cystic teratoma 11%, Chocolate cyst 3%, serous cyst adenocarcinoma 2%.

*Conclusion:* The ovarian tumors are detected effectively by Ultrasound but the nature of pathology i.e. Benign or Malignant is confirmed by histopathology so both these investigations be done in patients for accurate diagnosis of the ovarian masses.

**Keywords:** Ovarian Masses; PCOS; Benign Ovarian Tumor; Hemorrhagic cyst; Chocolate Cyst; Malignant Ovarian Tumor; Cystic Teratoma.

### Introduction

Ovary is an important organ as it is concerned with progeny. The ovary consists of mesenchymal and sex cells which are multipotent and totipotent respectively. So when it becomes neoplastic, almost any type of tumour can result. Ovary is perhaps the only organ of the body, whose tumour present a wide gamut of histopathological varieties ovarian tumours along with non-neoplastic. Lesions present a great challenge to gynaecologists as various tumours mimic an ovarian neoplasm [1]. In Ovarian tumours diverse histopathologies are common reflecting the different cell origins of the tumours. Ovarian cancer is the one of the common cancer among females of India and continues to present at an advanced stage [2]. Japan and Asian countries have rates of 2-6.5 new cases per 100,000 women per year [3]. Ovarian carcinoma represents the sixth most common female cancer and the fourth leading cause of death due to cancers in women and is seen predominantly after 3<sup>rd</sup> decade [4]. Ovarian cysts of benign nature

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may occur at any point in the life, but they are most common during childbearing age and constitute about 90% of ovarian tumours [5]. Most benign tumours are cystic and finding of solid elements make malignancy more likely. The most recent Surveillance, Epidemiology and End Results (SEER) calculations of lifetime risk for ovarian cancer are that 1 in 55 women will develop ovarian cancer over their lifetime [6]. Ovarian tumours are generally difficult to detect until they are advanced in stage or size, as the symptoms are vague and manifest over time. Different investigation tools such as serum CA-125 and pelvic examinations over a period of past many years have been tested and shown lower sensitivities in the diagnosis of ovarian masses.

Owing to this and high mortality rate associated with ovarian malignancy, ultrasound has attained its role as the most important preliminary investigation of choice to rule out ovarian malignancies with sensitivity ranging from 80-100% (Kinkle *et al.*, 2000 [8]; Van Calster *et al.*, 2005 [9]). Although Doppler ultrasound allows detection of tumor flow, its role has not been found consistent in diagnosis of malignancy (Kinkle *et al.*, 2005 [9]). Moreover, there exists a wide variation in patient population imaging techniques and results; making things more complicated to precisely understand and assess the diagnostic ability of existing various imaging techniques. Ultrasound features of malignant ovarian masses are (Ameje *et al.*, 2009 [7]):

- Cysts with thickened and irregular walls,
- Internal septae (>3 mm),
- Vegetation or papillary projections,
- Cystic lesions greater than 10 cm diameter,
- Presence of solid components or completely solid lesions.

Other associated findings include ascites or peritoneal deposits. Based on these features (Sassone *et al.*, 1991 [10]) derived a scale which focused on the features such as echo pattern of the lesion, presence or absence of papillary projection and septae, and wall thickness. Determination of various histologic patterns of ovarian tumours is very important in diagnosis, prognosis as well as treatment of ovarian

tumours. Prognosis of the tumours can also be predicted from the degree of differentiation of the tumours. Primary tumours are classified into surface epithelial tumours, germ cell tumours, sex cord stromal tumours, germ cell sex cord stromal tumours, tumours of rete ovarii and miscellaneous tumours of which surface epithelial tumours are most common. The stage and bilaterality of the tumour also indicates their nature for example, tumours in the sex cord stromal category are almost always confined to a single ovary. On the other hand, approximately 65% of the metastatic tumours are bilateral [11].

#### *Aims and Objectives*

To study USG versus Histopathological diagnosis of ovarian masses at tertiary care center.

#### **Methodology**

After approval from Institutional ethical committee, this prospective study was conducted at Department of Obstetrics and Gynecology during the period of September 2013 to September 2015 on 100 women who were randomly selected among the women attending the hospital's Obstetrics and Gynecology OPD with: Menstrual irregularities, Pelvic inflammatory disease, chronic pelvic pain, mass per abdomen. Patients underwent transvaginal/transabdominal ultrasound. Those patients with palpable adnexal mass had ultrasonography to confirm ovarian mass. Patients with abnormal uterine bleeding, pain in abdomen in peri/post-menopausal age group were also subjected to transvaginal/transabdominal ultrasound for ovarian imaging in addition to endometrial thickness. Post hysterectomy patients with mass per abdomen to rule out ovarian malignancy. Pregnant patients, patients with tubal mass (hydrosalpinx, pyosalpinx, ectopic pregnancy etc.), were excluded from the study. Written informed consent taken from each patient. A detailed history of presenting complaints and associated symptoms was noted along with menstrual history. Initially diagnosis of mass done by sonography later on by histopathology.

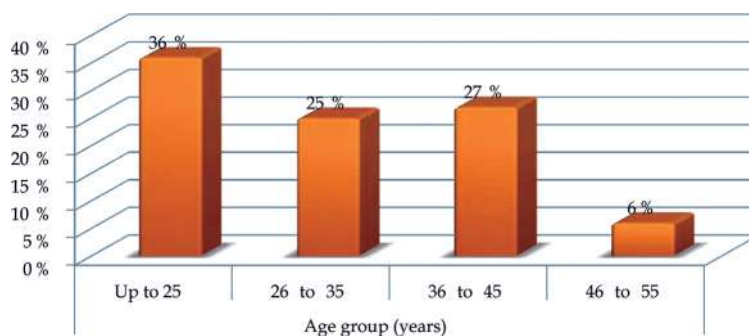
#### **Results**

**Table 1:** Age wise distribution

Age group (years)	Frequency	Percent
Up to 25	36	36.0
26 to 35	25	25.0
36 to 45	27	27.0
46 to 55	6	6.0
>55	5	5.0
Total	100	100.0

In the present study, out of the 100 women; maximum (36%) were within the age group of up to 25 years, 27% in 36 to 45 years, 25% in 26 to 35 years, 6.0% in 46 to 55 years & 5% >55 years each.

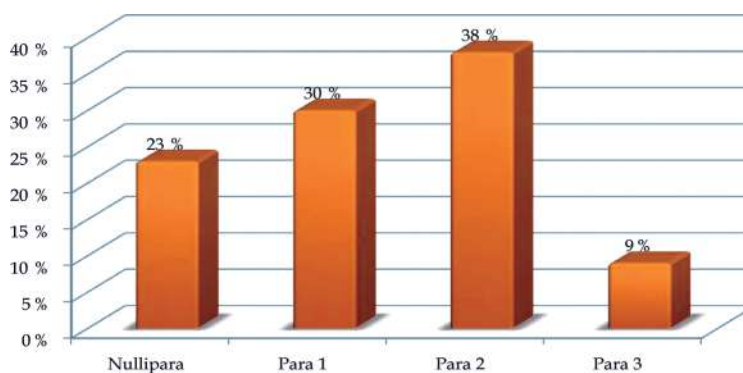
Out of 100 women, 38% were para two, 30% were primipara 23% were nulliparous & 9% were para three. Most of the ovarian masses were Right sided 49% while 30% were on Left side. 21% were bilateral



Graph 1: Distribution of cases according to age

Table 2: Parity wise distribution

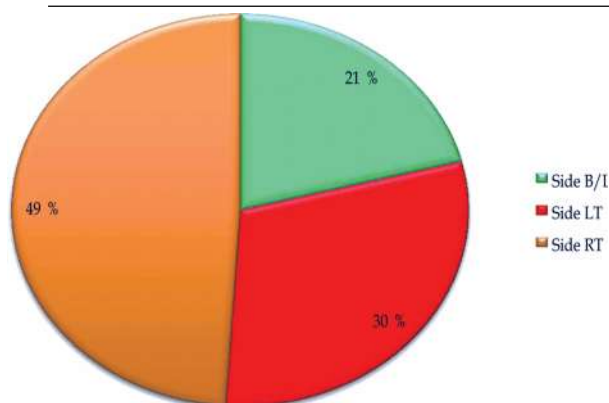
Parity	Frequency	Percent
Nullipara	23	23.0
Para 1	30	30.0
Para 2	38	38.0
Para 3	9	9.0
Total	100	100.0



Graph 2: Parity wise distribution

Table 3: Side involved

Side	Frequency	Percent
B/L	21	21.0
LT	30	30.0
RT	49	49.0
Total	100	100.0



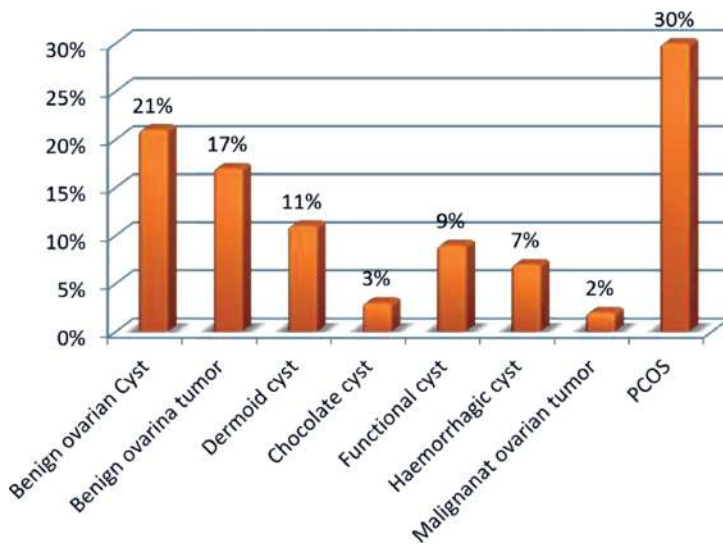
Graph 3: Side involved

**Table 4:** USG Diagnosis of ovarian lesion

Finding	Frequency	Percent
Benign ovarian Cyst	21	21.0
Benign ovarian tumor	17	17.0
Dermoid cyst	11	11.0
Chocolate cyst	3	3.0
Functional cyst	9	9.0
Hemorrhagic cyst	7	7.0
Malignant ovarian tumor	2	2.0
PCOS	30	30.0
Total	100	100.0

Ultrasonography suggested that there were 30% cases of PCOS, 21% cases of Benign ovarian cyst, 17% cases of Benign ovarian tumor and 11% cases were of dermoid cyst, 9% functional cyst, 7% haemorrhagic cyst, 3% chocolate cyst, 2% malignant ovarian tumor.

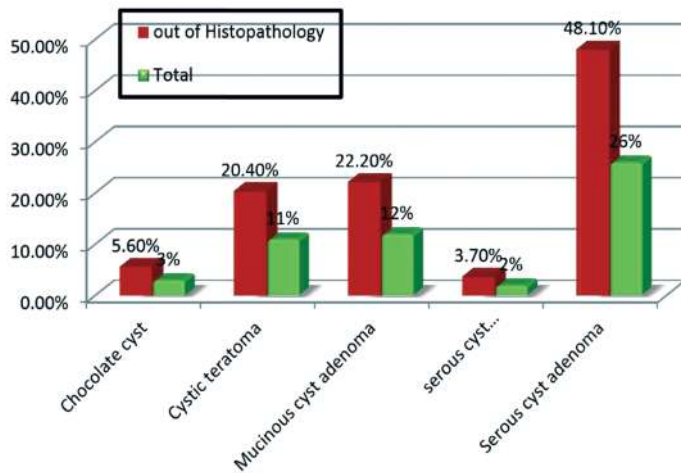
HPE reports found that the most common mass was serous cyst adenoma 26%, Mucinous cyst adenoma 12%, Cystic teratoma 11%, Chocolate cyst 3%, serous cyst adenocarcinoma 2%.



**Graph 4:** Distribution of patients according to the USG diagnosis

**Table 5:** Histopathological diagnosis

Histopathological Diagnosis	Frequency	Histopathology (n=54)	Total (n=100)
Chocolate cyst	3	5.6	3.0
Cystic teratoma	11	20.4	11.0
Mucinous cyst adenoma	12	22.2	12.0
serous cyst adenocarcinoma	2	3.7	2.0
Serous cyst adenoma	26	48.1	26.0



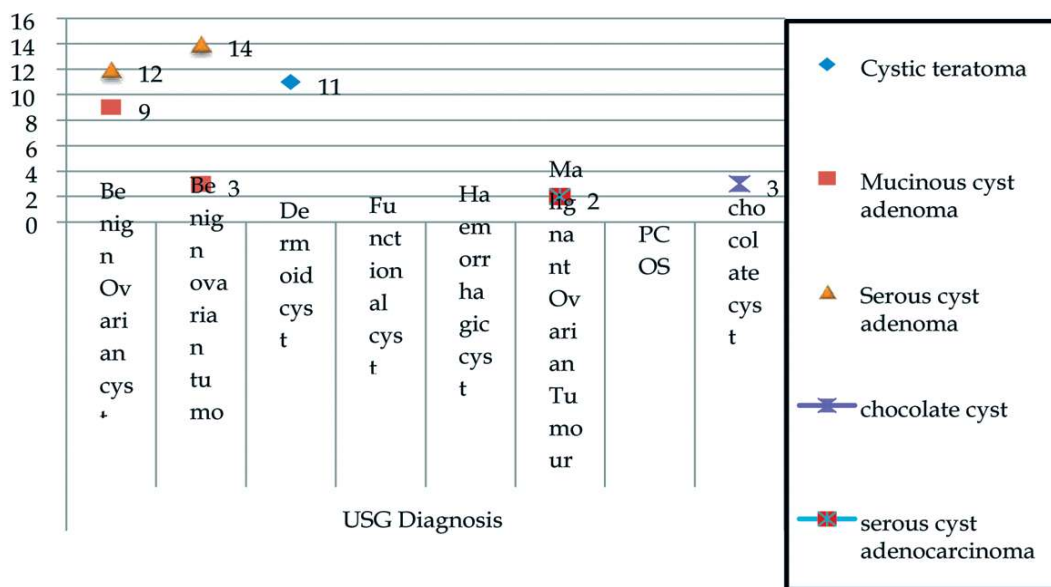
**Graph 5:** Histopathological diagnosis

**Table 6:** Relation of USG diagnosis with histopathological diagnosis

USG Diagnosis	Histopathological diagnosis					Total
	Cystic teratoma	Mucinous cyst adenoma	Serous cyst adenoma	chocolate cyst	serous cyst adenocarcinoma	
Benign Ovarian cyst	-	-	-	-	-	-
Benign ovarian tumor	-	9	12	-	-	21
Dermoid cyst	11	-	-	-	-	11
Functional cyst	-	-	-	-	-	-
Haemorrhagic cyst	-	-	-	-	-	9
Malignant Ovarian Tumour	-	-	-	-	-	-
PCOS	-	-	-	-	2	2
chocolate cyst	-	-	-	-	-	-
Total	11	12	26	3	2	100

Of 21 USG diagnosis as benign ovarian cyst on intraoperative diagnosis, 9 turned out to be ovarian cyst, 12 as solid and cystic ovarian tumor and 1 was with ovarian torsion. Of 17 patients with USG diagnosis as benign ovarian tumor, 6 were diagnosed as ovarian cyst, 11 as solid and cystic ovarian tumor and 1 was with torsion on intraoperative diagnosis.

Of 11 patients with dermoid cyst on USG diagnosis, 11 were also diagnosed to be dermoid cyst and 2 were with ovarian torsion. Of 2 patient with malignant ovarian tumor on USG were also diagnosed as malignant in 1 patient intraoperative and 1 was solid and cystic ovarian tumor. All 3 patients with chocolate cyst on USG were also diagnosed intraoperative.



**Graph 6:** Relation of USG diagnosis with histopathological diagnosis

**Discussion**

The presence of ovarian mass is as much distressing to the patient as to gynaecologist. The myriad diagnosis of ovarian masses has always perplexed clinicians. Accurate diagnosis can save the patient from complications due to both the progression of the disease and to excessive or

inappropriate diagnostic testing.

Our study was aimed at evaluating the usefulness of USG in studying the anatomy and pathology of ovary in cases of benign ovarian tumours and cysts, functional cyst, malignant ovarian tumour, PCOS, and its application in management. Knowledge of exact nature of an ovarian mass after USG examination is a prerequisite for effective

management, surgical or medical. Diagnosis of ovarian masses revealed by USG, were confirmed by histopathological examination after surgery.

In our study we have found that in Ultrasonography there were 30% cases of PCOS, 21% cases of Benign ovarian cyst, 17% cases of Benign ovarian tumor and 11% cases were of dermoid cyst, 9% functional cyst, 7% hemorrhagic cyst, 3% chocolate cyst, 2% malignant ovarian tumor. These findings are similar to several studies with ovarian masses including endometriotic cysts, dermoid cysts, tubo-ovarian abscesses and other benign cysts (Aleem *et al.*, 1995 [12]; Zalel *et al.*, 1997 [13]; Pascual *et al.*, 2000 [14]).

While in the histopathology findings the most common mass was serous cyst adenoma 26%, Mucinous cyst adenoma 12%, Cystic teratoma 11%, Chocolate cyst 3%, serous cyst adenocarcinoma 2%. In the review of histopathology of others authors the findings are: Serous cyst adenomas were shown the commonest among the Indians and teratoma were the commonest benign tumour among the Malays and Chinese [15]. Serous tumours were found to be more common than mucinous. Similar results were reported by Prabhakar *et al* in which serous tumours were the commonest followed by mucinous tumours [16]. Some molecular and histological evidence suggests that mucinous epithelial ovarian cancers develop via a sequence from benign tumour through borderline tumour to invasive cancer which suggests the potential preventability of borderline and invasive mucinous ovarian cancer by surgical excision of identifiable precursor lesions [17]. A retrospective study by Ahmed *et al* showed benign cystic teratoma to be the commonest benign tumour (35.17%) [18]. The study in Belgium by Pilli *et al* explored epithelial tumours to be the commonest variety constituting 70.9% of all the ovarian tumours. Second most common to be the germ cell tumour (21.2%) followed by sex cord stromal tumours (6.7%) and metastatic tumours (0.7%) [19].

## Conclusion

Ultrasound is an important diagnostic modality in the field of gynaecology, especially for detection of ovarian pathology. Several ultrasonographic criteria have been used to differentiate benign from malignant tumours of ovary. Patients at high risk of ovarian carcinoma, eg those with family history should be monitored with transvaginal sonography. This study was conducted with a view to find out diagnostic value of ultrasonography and histopathology. The

ovarian tumours are detected effectively by USG but nature of pathology that is benign or malignant is confirmed by histopathology.

The ovarian tumors are detected effectively by Ultrasound but the nature of pathology i.e. Benign or Malignant is confirmed by histopathology so both these investigations be done in patients for accurate diagnosis of the ovarian masses.

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