



## Histomorphological And Radiological Spectrum of Adnexal Masses: An Experience in Tertiary Care Hospital of Central India

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### Abstract

Adnexal mass is the most common cause of presentation of reproductive women who attend gynaecological OPD. Adnexal masses in females are a diagnostic challenge, given their proximity to a variety of pelvic structures and because of a long list of a broad differential diagnosis. For proper patient management a multidisciplinary approach wherein the radiologist and the pathologist have an important role in distinguishing between malignant, benign and inflammatory lesions is vital for assisting in clinical decision-making.

**Aim:** The aim of the study was to analyse pre- and postoperative findings of patients with adnexal masses and to predict the utility of ultrasound findings with the histopathological findings.

**Methods:** This is a prospective observational study carried out on 60 patients with adnexal masses. Clinical and pre-operative ultrasound assessment was done at the Department of Pathology and Radiology, N.S.C.B. Govt. Medical College, Jabalpur and who underwent surgical resection of their masses in a tertiary care hospital. After surgery histopathological (HP) findings of lesions were analyzed as a mean of final diagnosis and staging

**Results:** Out of 60 cases, pre-menopausal age group was more frequently affected than post- menopausal age group. Predominant symptoms of the patients were abdominal pain, abdominal distension, menorrhagia, and dysmenorrhea. Among the adnexal lesions, maximum lesions were ovarian (85.1%). The incidence of neoplastic ovarian masses is much higher than the non-neoplastic masses. The most common benign ovarian lesion seen in our study was serous cyst adenoma (23.3%) followed by mucinous cystadenoma (16.7%). Among the malignant tumors, serous cystadenocarcinoma (8.3%) was the most common tumor. The diagnosis given on ultrasound was confirmed with histopathological findings. Ultrasound diagnosis of adnexal masses revealed a sensitivity of 94.4%, specificity of 83.3%, positive predictive value of 70.8%, and negative predictive value of 97.2%.

**Conclusion:** This study illustrates clinical and radiological examination are useful in pre- operative work-up of adnexal lesions but histopathological examination plays an important role in assessing pelvic masses and in choosing the appropriate patient management. The presence of solid component in an ovarian mass was a highly accurate predictor of malignancy.

**Keywords:** Adnexal mass, ovarian lesions, Histopathology, ultrasound

### INTRODUCTION

Adnexus literally means appendage. This term has been derived from latin language. The adnexa of uterus are collectively called as adnexa uteri. The structures that make up the adnexa uteri include ovary,

fallopian tube and ligaments. Most common adnexal mass are of ovarian origin and present with diverse range from functional ovarian cyst to benign tumors or malignant tumors of the ovary. Of all the adnexal

masses, ovarian tumors alone account for nearly two-third of all the cases. Ovarian cancer has emerged as one of the most common malignancies affecting women in India. The age-specific incidence rate for ovarian cancer revealed that the disease increases from 35 years of age and reaches a peak between the ages of 55 and 64 years.

In most of the population-based cancer registries in India, ovarian cancer is the third leading site of cancer among women. The age-adjusted incidence rates of ovarian cancer vary between 5.4 and 8.0 per 100,000 population in different parts of the country. (1)

After pelvic examination, transvaginal, or transabdominal ultrasonography (USG) evaluation for surgical assessment of an adnexal mass. Imaging plays an ever-increasing role in the diagnosis of suspected gynecologic diseases.

Pathology reports are considered the reference standards for assessing the accuracy of imaging findings. Ultrasonography is currently the imaging procedure of choice for assessing the female genital organs. It has emerged as a sensitive modality in the diagnosis of malignant masses. The most critical step after identification of the mass is the determination of the degree of suspicion for malignancy, which has a profound effect on patient survival and to promote more conservative (management for benign disease and optimise referrals to Oncologists in cases of suspected ovarian malignancies. A multidisciplinary approach is needed for the optimal management of patients presenting with adnexal mass.

The purpose of present study was

To assess the pathological spectrum of adnexal masses and to determine the diagnostic efficacy of ultrasound in diagnosing adnexal masses.

To study the frequency distribution of various adnexal masses by age, anatomic region, and type.

- To study the sensitivity and specificity of the clinical diagnosis and ultrasound, in the diagnosis of malignant ovarian tumors.

## MATERIALS AND METHODS

A hospital based prospective, observational study was carried out on 60 patients with adnexal masses and pre-operative ultrasound assessment and who

underwent surgical resection of their masses at NSCB, Medical College,

Jabalpur, Madhya Pradesh The exclusion criteria was all female patients with radiological diagnosis and no histopathological reports or vice versa or patients who did not give consent. The relevant clinical data of the patients including age, parity, clinical presentation, menstrual status, ultrasound findings, and serum CA-125 levels were collected in appropriate proforma.

The surgically resected adnexal masses included: Ovarian masses or oophorectomy specimens, either with an attached fallopian tube or in isolation, Para ovarian lesions, Fallopian tube specimens, Subserosal fibroid along with uterus cervix or just myomectomy specimen and Broad ligament fibroid.

The specimens were processed routinely and stained with Haematoxylin and Eosin stain and examined microscopically

The data of the present study was analysed with the help of SPSS 20 software for windows. Appropriate univariate and bivariate analysis and the descriptive statistics were carried out. The sensitivity and diagnostic accuracy were measured for ultrasound when compared to histopathological diagnosis, which was taken as the gold standard in this study.

## RESULTS:

Among the 60 cases studied the age group of the subjects ranged from 15 years to 66 years and majority of the patients were in the reproductive age group. (Graph 1). The predominant symptoms of the patients were abdominal pain along with abdominal distension followed by menstrual irregularities and urinary complaints. Among the adnexal lesions studied, maximum lesions were ovarian, which constitute 85 % of the total cases followed by uterine (6.7%), fallopian tube (5%) and broad ligament (3%). The benign neoplasms of ovarian (48.6%) were more common than malignant (36.7%) (graph 2) The frequency of different histopathological types of ovarian tumours showed that surface epithelial tumours were the commonest tumour followed by germ cell tumours

. In the surface epithelial category most common tumour was serous cyst adenoma (23.3 %) followed by mucinous cystadenoma ( 16.7 %) .In our study, the most common germ cell tumours mature cystic teratoma (10%)

Among malignant epithelial ovarian tumours, the commonest histopathologic types encountered in our series was Serous cystadenocarcinoma 8.3%, followed by Mucinous Carcinoma 3.3% and 1.7% of Endometrioid Adenocarcinoma.

Among Sex Cord - Stromal Tumour 3.3% cases of adult granulosa cell tumour and 1.7 % juvenile granulosa cell tumour. (GRAPH NO. – 3) In the present study, among the Germ Cell tumours, majority of cases were of Mature Cystic teratoma 10%, followed by Yolk Sac tumour 3.3% and one case of Teratoma with malignant transformation and one case of Dysgerminoma and only one case of Krukenberg tumour was reported in our study. The other adnexal

lesions studied include broad ligament leiomyoma (11.7%), ectopic pregnancy (5%), Endometriotic Cyst (3.3%) and 2 cases of Leiomyosarcoma.

Majority of the ovarian lesions were solid cystic in nature, comprising 52.17% of the cases, while cystic comprised 39.13 % of the cases. Ovarian neoplastic lesions with predominantly solid component constituted 8.7% of the total ovarian cases.

Among the 60 cases of adnexal mass which were analyzed 22 cases were diagnosed clinically as malignant, and 38 cases were diagnosed as benign. Out of 38 benign cases, concordance was seen in 36 cases while discordance were seen in two cases. Similarly, Out of 22 malignant cases, discordance was seen in six cases. The sensitivity of clinical diagnosis is 88.9%, specificity of clinical diagnosis is 85.7%, positive predictive value is 72.7%, and negative predictive value is 94.7% in our study.

Considering the histopathological findings as the gold standard, the sensitivity of Ultrasound findings was found to be 94.4 % while Specificity of ultrasound diagnosis- 83.3%, Positive predictive value of ultrasound diagnosis-70.8% And Negative predictive value of ultrasound diagnosis- 97.2%.(Graph 4)

## DISCUSSION

Adnexal mass is a common entity in gynecologic patients. Masses arising either from ovaries, fallopian tubes, broad ligament, uterus or adjacent pelvic organs can present as adnexal masses, thus have a broad differential diagnosis, including benign and malignant neoplasms and non-neoplastic diseases.

The differentiation of benign from malignant masses is of great therapeutic significance. Hence, the pre-operative detection of the nature of adnexal mass can assist with appropriate referral, surgical and treatment planning, and patient counselling regarding expectations as well as the risks and benefits of the procedure becomes extremely important for appropriate management.

Ultrasound is often the first-line imaging modality for the evaluation of adnexal masses, especially in reproductive age women, in whom the ovaries are a potential cause.

Patients of adnexal mass generally present with abdominal symptoms which can range from non-specific like abdominal fullness, heaviness to severe pain in acute emergencies. As the size of mass increases so do the pressure symptoms leading to urinary or bowel symptoms. Irregularities in menstrual are present only rarely [2]

81.7% patients presented with abdominal pain with or without abdominal distension and Menstrual abnormality was reported by only 13.3% of patients

In most published literature, abdominal pain remains the most common presenting symptom of the patient presents 3.4

Among the adnexal cases studied the age group of the subjects ranged from 15 years to 66 years and majority of the patients were in reproductive age. Prior studies have revealed similar findings. (5,6)

In our study, 46 cases of the ovarian tumour were reported out of which, 30 were benign tumours, and 16 were malignant. Similar incidence was noticed in many different studies where the incidence of benign tumours was more than malignant. (table 2)

In our study the sensitivity of clinical diagnosis was 88.9%, specificity

of clinical diagnosis is 85.7%, thus relevant history and clinical examination of the patient were able to diagnose adnexal masses.

In the present study, origin of adnexal mass in 85% was ovary followed by uterus (6.7%), fallopian tube (5%) and broad ligament (3%) of all the subjects. The preponderance of ovarian lesions in adnexal masses in our study was also similar to other published literature. 11-12

Most ovarian tumors cannot be distinguished from one another on the basis of their clinical or gross characteristics alone, thus histopathological evaluation is necessary. Out of 36 benign adnexal lesions on USG, 35 lesions turned to be benign in histopathology and 1 lesion was identified as malignant which was diagnosed as benign in USG. Out of 24 malignant lesions, 17 lesions turned out to be malignant lesions in histopathology and 07 adnexal lesions which were thought as malignant in USG turned out to be benign lesions in histopathology.

, thus, in our study the sensitivity was 94.4%, specificity was 83.3%, positive predictive value was 70.8%, and negative predictive value was 97.2%. In a large meta-analysis, it was found that the sensitivity of use of ultrasound for the diagnosis of ovarian cancer ranged from 86 to 91 percent and the specificity ranged from 68 to 83 percent. 13

The findings of our study were concordant with the various studies graph 5. Our study showed wide spectrum of masses with solid, cystic and mixed intense lesions. Gross examination of the specimens revealed that majority of the tumors were mixed 52.17% followed by cystic 39.13% and predominantly solid comprised of 8.70%. Majority of the benign lesions 56.67% were cystic in nature while 40% had both solid and cystic consistency, while Malignant lesions were solid cystic (75 %) and solid (18.75%) in consistency. These findings were correlated with earlier studies done. (6,7)

Determination of various histological patterns of ovarian tumours is very important for the management of patient, as the diagnosis and prognosis of ovarian tumours depend upon its histological type.

In the present study, out of 46 ovarian tumours 45 were primary while only one was metastatic Krukenberg tumour. Most of them were epithelial tumours (69.56%) Among the epithelial tumours, benign epithelial tumours were the commonest type (75 %) followed by malignant epithelial tumours (25 %). (Figure 1) Among the histomorphological types of epithelial tumours, serous tumours (59.37%) were the most common followed by mucinous tumours (37.5%) and the least common were neoplasms of endometrioid type. The frequency of different histopathological types of benign epithelial tumour showed that the commonest tumour was serous

cystadenoma (23.3 %) followed by mucinous cystadenoma (16.7%). Serous cystadenocarcinoma (8.3 %) (figure

2) was the commonest malignant epithelial tumour which were comparable with similar studies. (8)

Mature cystic teratoma was the most frequently encountered benign germ cell tumour (10%). Malignant germ cell tumours included dysgerminoma (3.3%) and yolk sac tumour (1.1%) and one case of carcinoma arising from mature cystic teratoma (figure 3,4). These findings correlated with earlier studies performed. (18) In study total 7 cases (11.7%) were identified as leiomyoma and 2 cases (3.3%) of leiomyosarcoma comprising 3.3% of cases. Ultrasound was able to identify them. (Figure 5)

Five patients presented with acute abdomen of which 5% were Ectopic Gestation (figure 6) and 3.3% were of Endometriotic Cyst. The principal aim of the evaluation of adnexal masses is to diagnose and manage acute conditions and to determine whether a mass is benign or malignant [4]

#### Conclusions:

Our study highlights the wide variety of adnexal lesions in our set-up. Adnexal masses can be gynaecological or non-gynaecological. Varied presentation and vast histological spectrum of neoplastic and non-neoplastic lesions ranging from epithelial, mesenchymal, germ cell, sex-cord stromal hormone secreting, and embryonal cells as encountered in our study emphasize the need for it. USG should be considered for the evaluation of adnexal lesions. Majority of the adnexal masses are primary diseases of the ovary. Clinical and radiological examination form the initial steps in work-up still it is important to determine the histopathological pattern of ovarian tumours to assess the type and grading of the lesion which will be greatly helpful in the management of the disease thereby reducing the morbidity and mortality.

A complete evaluation from the history, physical examination, ultrasound and histopathology will find the most likely cause of an adnexal mass. In this way, clinical, radiological and pathological studies have the greatest benefit to ongoing patient care and thus the purpose of our study has been met.



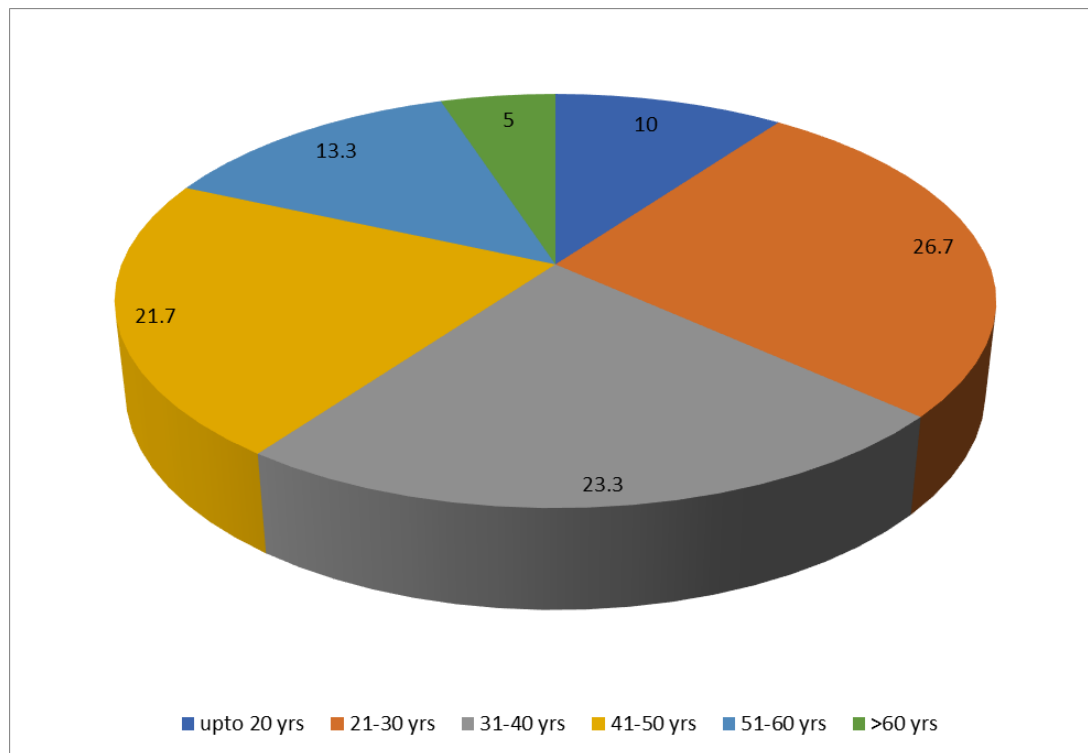
To conclude histopathological evaluation of adnexal masses remains to be the gold standard and has an important role in the management as well as in determining the outcome of the patient.

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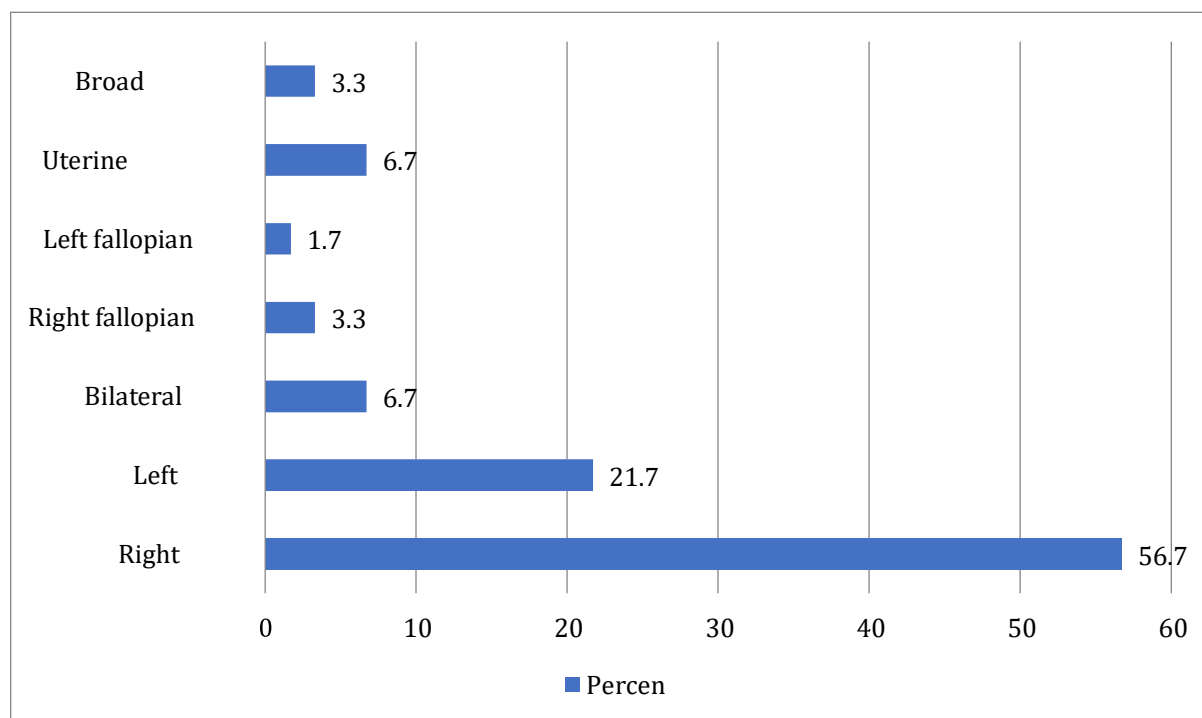
**GRAPH NO. – 1 AGE WISE DISTRIBUTION OF CASES.**

**TABLE 1 PRESENTING COMPLAINTS**

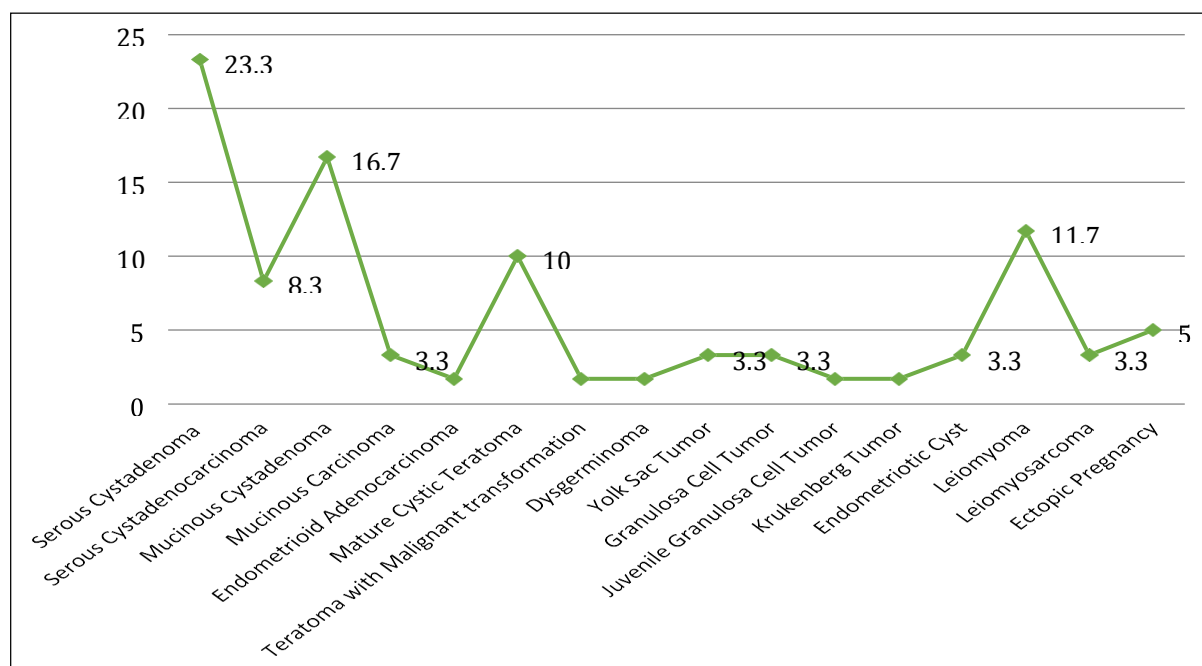
Symptoms	No. OfCases	Percent
Abdominal Pain with or without Abdominaldistension	49	81.7
Menstrualirregularity	8	13.3
Urinary complaints	3	5

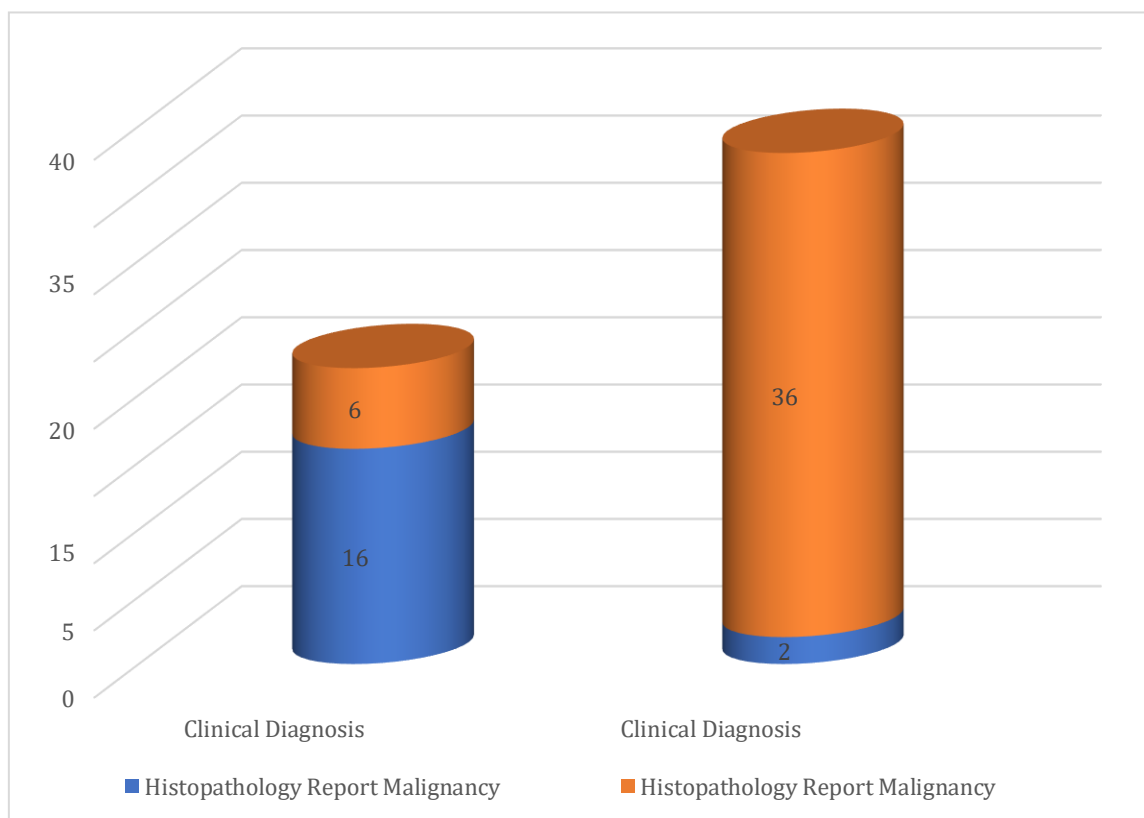
Total	60	100
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**Graph 2 RADIOLOGICALLY CONFIRMED SITE OF LESION**



**GRAPH NO. – 3 HISTOPATHOLOGICAL DIAGNOSIS**



**GRAPH NO. – 4 CLINICAL DIAGNOSIS VERSUS HISTOPATHOLOGY REPORT FOR MALIGNANT TUMORS****Table 2**

Study name	No of cases	Benign	Malignant
A.S. Patel et al <sup>7</sup>	162	93.2%	6.2%
Anitha PV et al. <sup>8</sup>	245	78.36%	15.11%
Mankar D, et al <sup>9</sup>	257	63.04%	31.12%
Puttaveerachary A, et al <sup>10</sup>	148	84%	12%
S. Radhamani et al <sup>11</sup>	100	90.46%	9.5%
Present study	60	66%	34%



Graph 5 Comparing Sensitivity And Specificity With The Various Studies

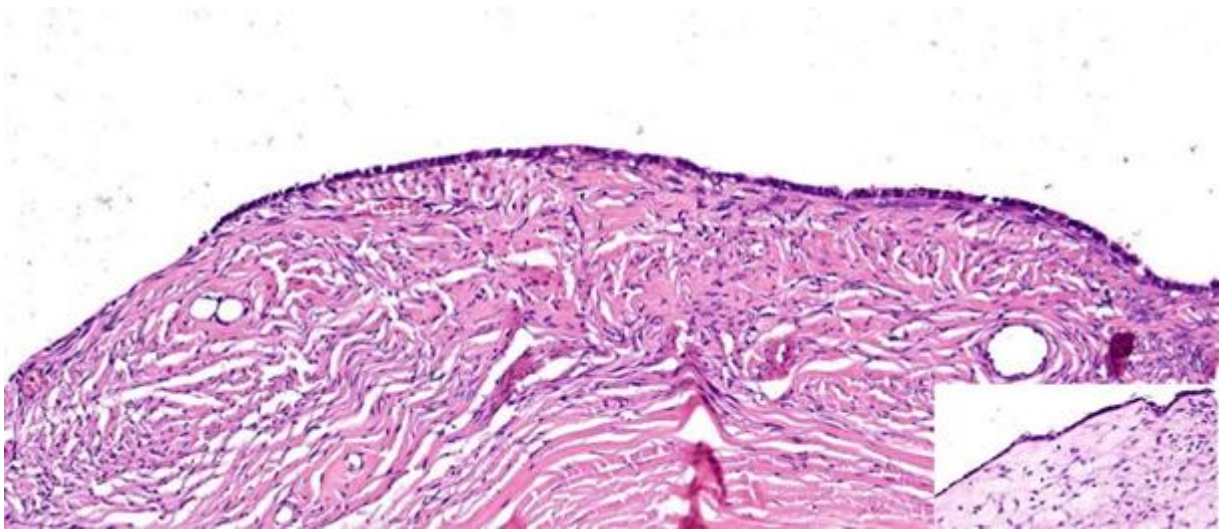
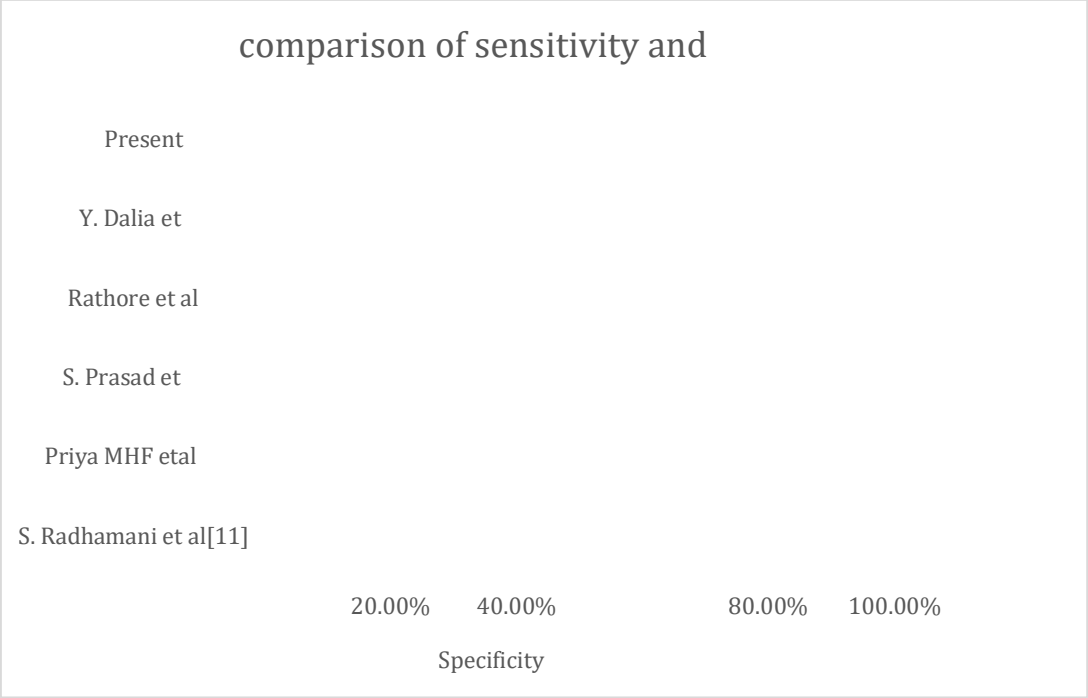


Figure 1 serous cystadenoma



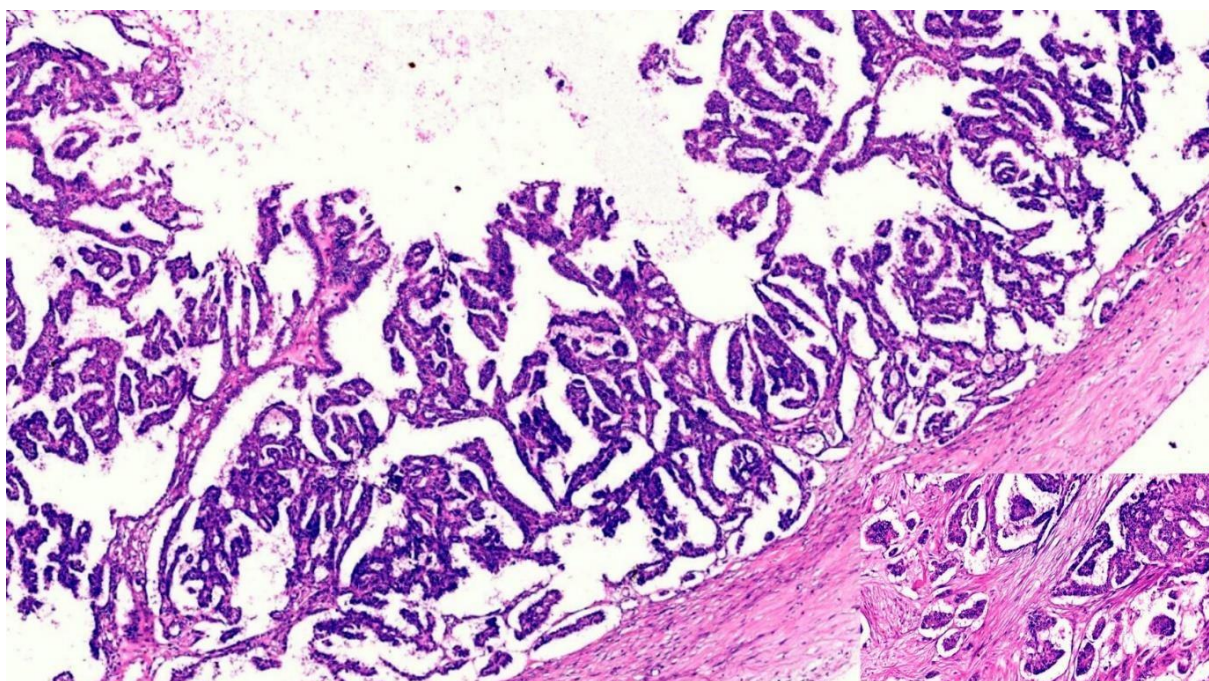


Figure 2 serous cystadenocarcinoma

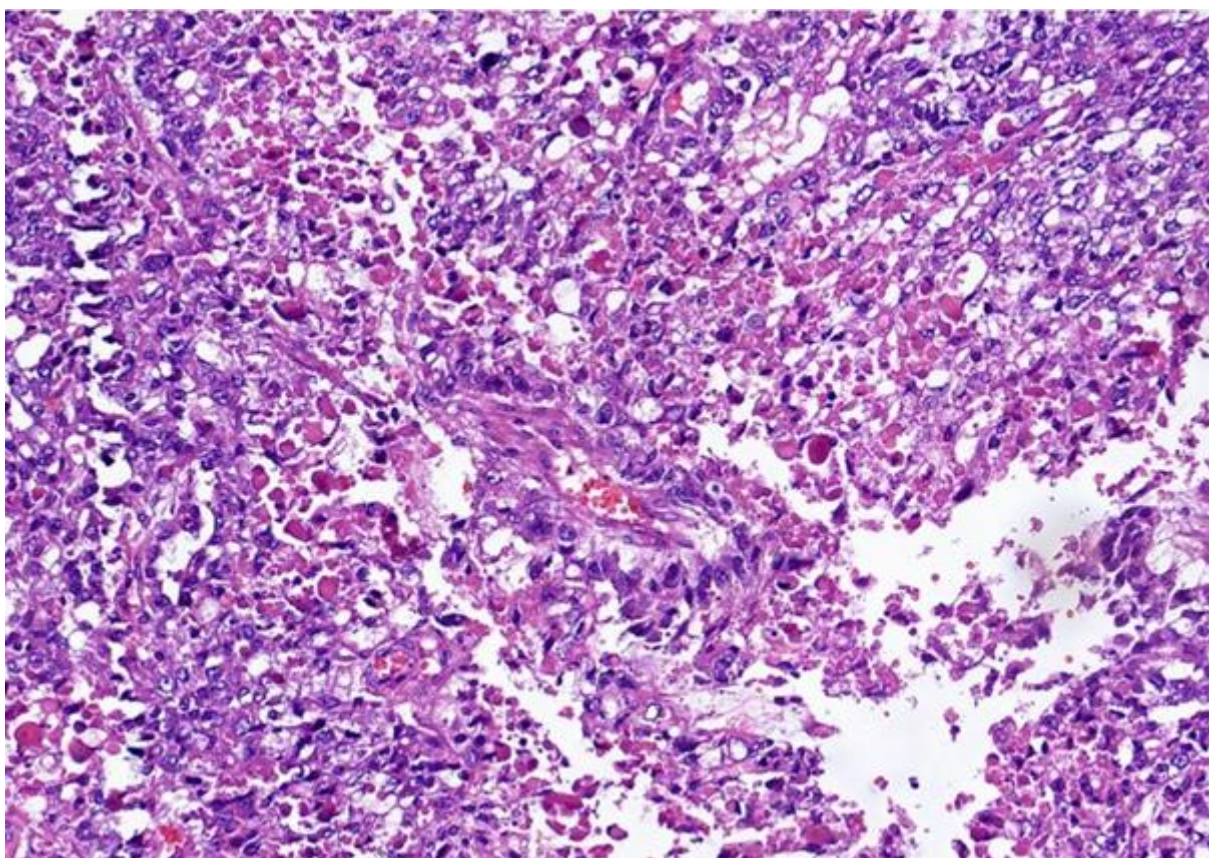
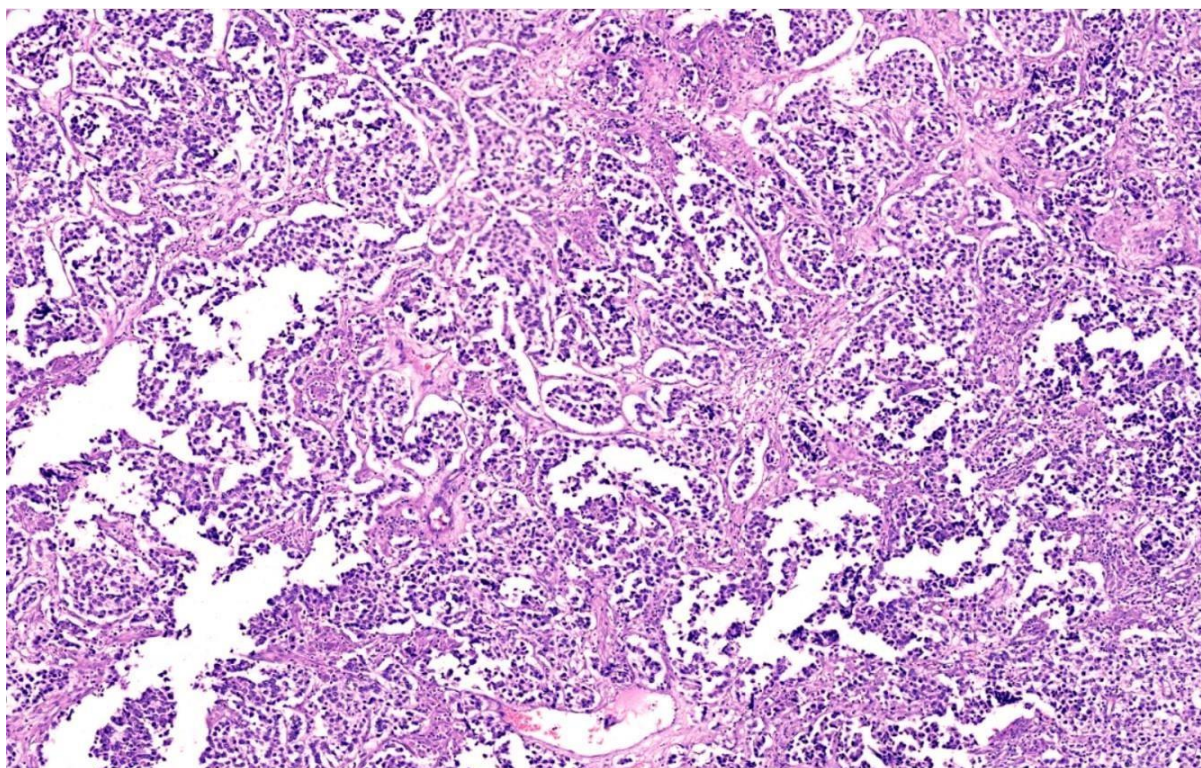
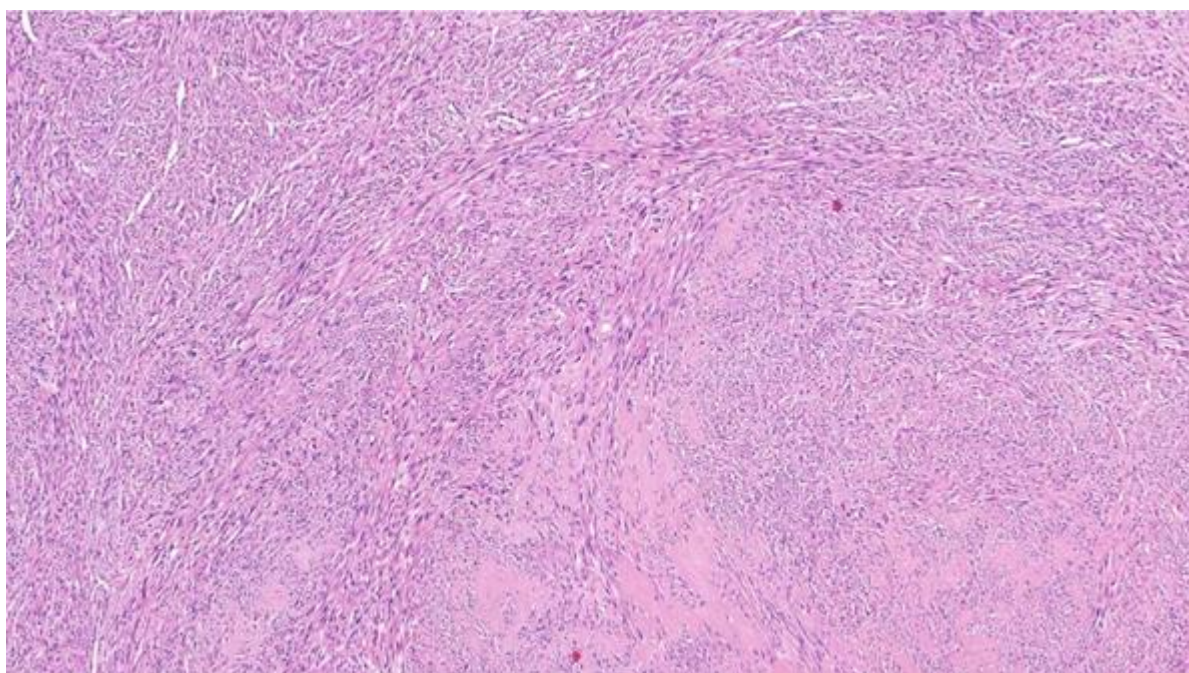


Figure 3 yolk sac tumor



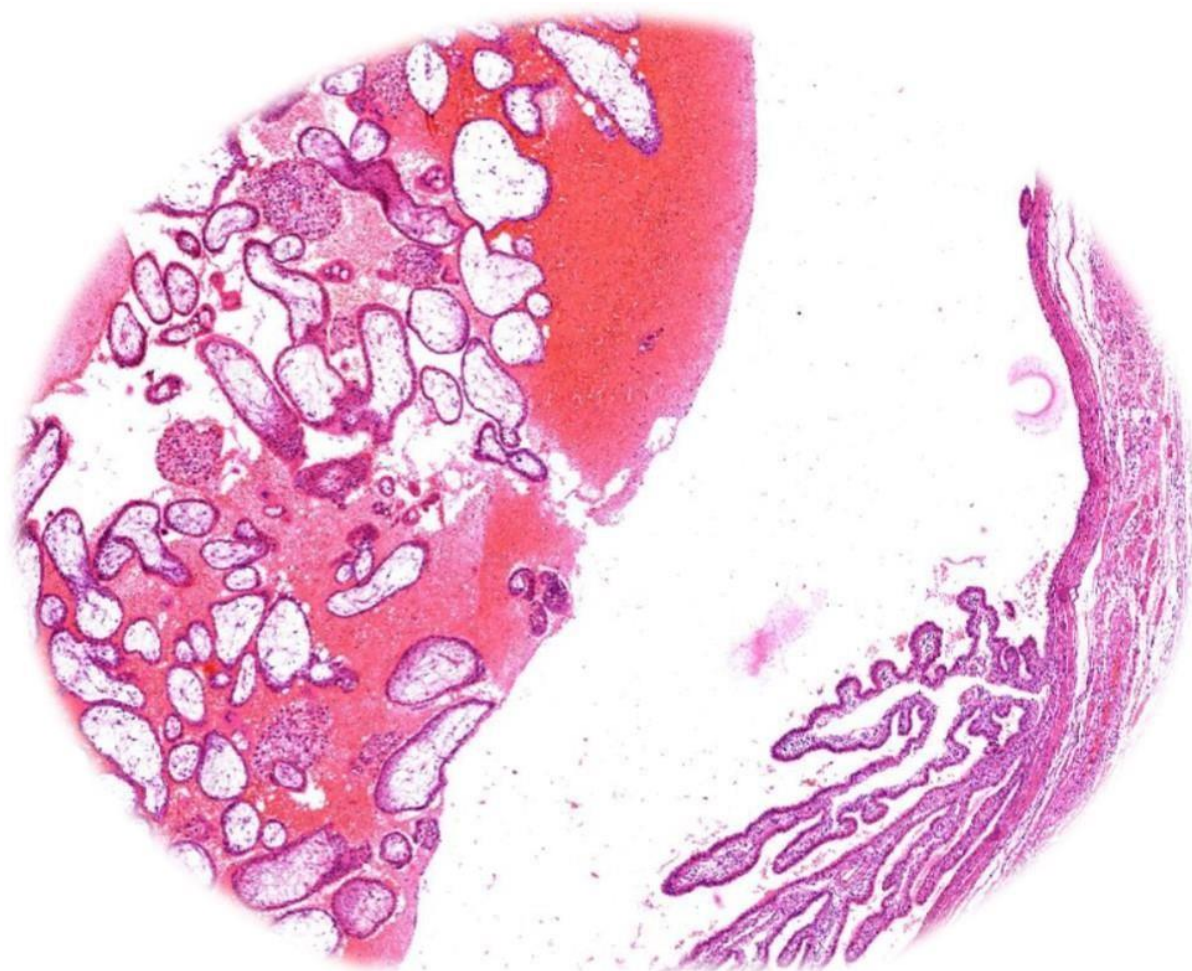


**Figure 4 dysgerminoma ovary**



**Figure 5 leiomyoma**





**Figure 6** ectopic pregnancy