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# Histopathological study of ovarian tumors in a tertiary care center: A 2 year retrospective study

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**Abstract**
**Background:** Ovarian tumor is the seventh leading cause of cancer death (age standardized mortality rate: 4/100,000) among women worldwide, and in India, it is comprising up to 8.7% of cancers in different parts of the country. There are numerous types of ovarian tumors; both benign and malignant. About 80% are benign and these occur mostly in young women aged between 20 and 45 years. The malignant tumors are more common in older women aged between 40 and 65 years.
**Objective:** To study the incidence, morphological and clinicopathological correlation, gross, histological pattern, and incidence of age distribution of ovarian tumors.
**Materials and Methods:** The present retrospective study was carried out in the Department of Pathology, Vishwabharti Medical College, Kurnool, A.P. for a period of 2 years. India, from January 2016 to December 2018. The diagnosis was confirmed by histopathological examination with hematoxylin and eosin stain. Special stains and immunohistochemistry were carried out whenever needed.
**Result:** Of the 86 cases of ovarian tumors, 65.1% were benign, 10.5% were borderline, and 24.4% were malignant. Histologically, surface epithelial tumors were the most common (74.4%) followed by germ cell tumors (17.4%), sex cord– stromal tumors (7.0%), and metastatic tumors (1.2%). Age incidence of benign tumor was age group of 21–40 years, borderline 21–40 years, and malignant 41–60 years.
**Conclusion:** It is concluded from this study that on morphological grounds, tumors originating from surface epithelium are the most common variant. Therefore, suggested that efforts must be made to identify the risk factors for malignancy.

**Keywords:** Ovarian tumors, benign, malignant

## Introduction
Ovarian tumor is the seventh leading cause of cancer death (age standardized mortality rate: 4/100,000) among women worldwide and in India it is comprising up to 8.7% of cancers in different parts of the country [1, 2]. Women between 65 and 84 years of age have ovarian cancer incidence rates 2 to 3 times higher than younger women. Ovarian tumors are notorious for their large size and their frequent association with relatively mild symptoms [3]. Peak incidence of invasive epithelial ovarian cancer is at 50–60 years of age. About 30% of ovarian neoplasms in postmenopausal women are malignant, whereas only about 7% of ovarian epithelial tumors in the premenopausal women are frankly malignant [4]. Risk factors for ovarian cancer are not well defined. However, there is general agreement on two: nulliparity and family history. Ovarian tumors are often difficult to detect until they are advanced in stage or size, as symptoms are vague and insidious. Identification of various histological patterns of ovarian tumors is important for diagnosis as well as prognosis [5].

## Materials and Methods
The present retrospective 2-year study was carried out in the Department of Pathology, Vishwabharti Medical College, Kurnool, A.P. for a period of 2 years. India, from January 2016 to December 2018.
The specimens were allowed to fix in 10% buffered formalin for 24–28 hours. After fixation multiple bits were taken from representative areas of the tumor and the accompanying tissue. Special attention was given to solid areas adjacent to the ovarian surface and papillary projections.

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They were processed for histopathological examination and paraffin blocks were made. The blocks were cut at 3–5 μm thickness and stained with hematoxylin and eosin stain. Special stains and immunohistochemistry were carried out whenever needed.

## Result

Out of the 86 ovarian tumours, 38 cases (44.2%) were cystic, 33 cases (38.3%) were solid/cystic and 15 cases (17.5%) were predominantly solid tumours. Bilaterality was detected in 7 cases (8.1%) of the total cases. Most of the benign ovarian tumour presented as cystic mass. Surface epithelial tumour was the commonest tumour according to the histogenesis. Among the malignant surface epithelial tumours, the incidence of mucinous cystandencarcinoma was 3.5% and serous cystadenocarcinoma was 3.5%. Serous cystadenoma was the commones tumour in benign category. In germ cell tumour category, benign cystic teratomas constituted highest numbers of cases i.e. 7. Followed by dysgerminoma 5 cases. Six cases of sex cord stromal tumour (5 cases of granulose cell tumour & 1 cases of Sertoli Leydig cell tumour) and 1 case of metastatic tumour were also detected in the study.

**Table 1:** Consistency of the Ovarian Tumour (n=86)

| Consistency | No. of cases | Percentages (%) |
|---|---|---|
| Cystic | 38 | 44.2 |
| Cystic/Solid | 33 | 38.3 |
| Solid | 15 | 17.5 |

**Table 2:** Distribution of ovarian tumors (n=86)

| Type of tumors | Number of cases | Percentage |
|---|---|---|
| Benign tumor | 56 | 65.1 |
| Borderline tumor | 09 | 10.5 |
| Malignant tumor | 21 | 24.4 |
| Total | 86 | 100 |

**Table 3:** Histological Types of Ovarian Neoplasms (n=86)

| Tumor type | Number of cases | Percentages % |
|---|---|---|
| Surface Epithelial Tumors | 64 | 74.4 |
| Sex Cord-Stromal Tumors | 06 | 7.0 |
| Germ Cell Tumors | 15 | 17.4 |
| Metastatic Tumors | 01 | 1.2 |
| Unclassified Tumors | 00 | 0 |
| Total | 86 | 100 |

**Table 4:** Distribution Of Cases according To the Histological subtypes (Total- 86)

| Tumours | Number | Percentages % |
|---|---|---|
| **Surface Epithelial tumours** | 64 | 74.4 |
| **A) Benign -** | 49 | 56.9 |
| Serous Cystadenoma | 30 | 34.8 |
| Papillary serous cystadenoma | 02 | 2.3 |
| Mucinous Cystadenoma | 17 | 19.7 |
| **B) Borderline -** | 09 | 10.4 |
| Borderline Serous Cystadenoma | 03 | 3.5 |
| Borderline Mucinous Cystadenoma | 06 | 6.9 |
| **C) Malignant** | 06 | 6.9 |
| Mucinous Cystadeno-carcinoma | 03 | 3.5 |
| Serous Cystadeno-carcinoma | 03 | 3.5 |
| Endometrioid carcinoma | 00 | 0 |
| **Germ Cell tumours** | 15 | 17.4 |
| Benign cystic teratoma | 07 | 8.13 |
| Immature teratoma | 01 | 1.2 |
| Dysgerminoma | 02 | 2.3 |
| Yolk sac tumour | 05 | 5.8 |
| **Sex cord stromal tumours** | 06 | 6.9 |
| Granulosa cell tumour | 05 | 5.8 |
| Sertoli Leydig cell tumour | 01 | 1.2 |
| **Others** | 01 | 1.2 |
| Metastatic tumor | 01 | 1.2 |

## Discussion

Ovarian tumours are a group of neoplasm affecting the ovary and have a wide spectrum of features. They include benign, low malignant potential or borderline and malignant subtypes. WHO classification of ovarian tumours is based on the tissue of origin of the tumours, surface epithelium, the germ cells and the stroma of the ovary. Of the three main groups, epithelial tumours are the most common with serous and mucinous cystadenomas being the commonest epithelial tumours of the 86 cases of ovarian tumors, 65.1% were benign, 10.5 % were borderline, and 24.4% were malignant. Histologically, surface epithelial tumors were the most common (74.4%) followed by germ cell tumors (17.4%), sex cord– stromal tumors (7.4%), and metastatic tumors (1.2%). Age incidence of benign tumor was age group of 21–40 years, borderline 21–40 years, and malignant 41–60 years. Similar observations were made by Swamy and Satyanarayana [6], Gupta et al. [7] and Pilli et al. [8] The most common epithelial tumors were serous cystadenoma followed by mucinous cystadenoma and germ cell tumor was similar results reported by Yasmin et al. [9] In this study, 07 cases (8.1%) of bilateral ovarian tumors were seen. This incidence is lower than 21.8% and 13.04% reported by Kanthikar et al. [10] Jha and Karki [11], Sharma et al. [14] Pachori et al. [15]

The largest tumor encountered in the present study was a mucinous cystadenoma measuring 31 × 19 × 13.5 cm in size. Similar observation was made by Zaman et al. [12] who reported a mucinous cystadenoma with a maximum diameter of 27 cm. The majority of the benign tumors occurred in the 21–40 years age group in the present study, and overall the carcinoma was more common at an older age

than the benign tumors, present findings concurred with the similar observation made by Pilli *et al*. [8] Jha and Karki [11] and Shah and Hishikar [13]. Menstrual irregularities were seen in 31.6% of the patients in the present study, which is correlated well with 36% as reported by Kanthikar *et al*. [10] Benign tumors were more often cystic in consistency in this study, which was comparable to the results of Kanthikar *et al*. and malignant tumors were solid consistency which was also comparable to the study of Kanthikar *et al*. Serous tumors were the most common tumors encountered in the study accounting for 63.9%), which is comparable to 50% as reported by Kanthikar *et al*. Mucinous tumors were seen in 30.2% cases of all ovarian tumors, which is lower than the studies conducted by Kanthikar *et al*. and Jha and Karki. [10, 11] In this study, 05 cases (5.8%) of granulosa cell tumors were seen, which was comparable to the study conducted by Zaman *et al*. [12] Yolk sac tumors were seen in 5 (5.8%) patients, between 40 and 50 years of age, constituting 1.24% of all the ovarian tumors with a median age of 37.2 years, comparable to the results observed by Ahmad *et al*. [3] and Zaman *et al*. [12]

The main strength of this study is that it gives the most comprehensive picture of the current state of ovarian tumor incidence and histopathological pattern. The limitation of this study is that it did not reveal the status of tumor markers and gene at the time of presentation in the ovarian cancer patient.

## Conclusion

The main strength of this study is that it gives the most comprehensive picture of the current state of ovarian tumour incidence and histopathologic pattern. Surface epithelial tumours are the commonest followed by germ cell tumours. The major limitation of this study include the small sample size and short study period. However A tentative conclusion can be drawn from the present study that ovarian tumours comprise one of the major neoplasms in female detected in this institution. Benign surface epithelial tumours are more common than malignant tumours.

So it is concluded from this study that on morphological grounds, tumors originating from surface epithelium are the most common variant. Therefore, suggested that efforts must be made to identify the risk factors for malignancy.

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