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Pathology

# HISTOPATHOLOGICAL STUDY OF OVARIAN TUMORS AT A TERTIARY HEALTH CARE CENTER

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**ABSTRACT** **INTRODUCTION:** The ovary is a complex female genital organ in its embryology, histology and steroid-genesis and has a very high potential to develop malignancy at all ages. Ovarian cancers account for 3% of all female cancers .Ovary is the third most common site of primary malignancy of female genital tract preceded by cervix and endometrium.

**AIMS:** 1) To study the age incidence of different benign, borderline and malignant tumors. 2) To study the frequency of unilateral and bilateral tumors. 3) To study the frequency of positive peritoneal and omental secondaries in malignant conditions.

**METHODS:** Retrospective histopathological study of 200 cases of ovarian tumors was done over three years from January 2017 to December 2019 at a tertiary health care centre. Ovarian tumors were classified according to WHO classification.

**RESULTS:** Total 200 cases of ovarian tumors were studied with age incidence, youngest age was 2 years (Yolk Sac Tumor) and oldest was 80 years (Krukenbergs). Maximum cases were found in 4th decade (42%).Benign tumors were highest (66%), borderline (5%), malignant (27%). Surface epithelial tumors were commonest followed by germ cell tumors.

**CONCLUSION:** Ovarian tumors have a varied clinical presentation with respect to age, nature of origin and geographical distribution. High index of suspicion and early diagnosis with histological confirmation can significantly reduce morbidity and mortality.

**KEYWORDS :** Ovary, Ovarian tumors, Benign, Malignant.

## INTRODUCTION

The ovary is a complex female genital organ in its embryology, histology and steroidogenesis and has a very high potential to develop malignancy at all ages. Few organs show a wide diversity of tumors like the ovary. Ovarian cancers account for 3% of all female cancers. Ovary is the third most common site of primary malignancy of female genital tract preceded by cervix and endometrium. Ovarian tumors exhibit a wide variation in structure and biological behavior. Ovaries are not clinically accessible and so easy screening methods for detecting ovarian tumors are not readily available[1]. Most of the ovarian cancers are detected when they have spread beyond the ovary thus accounting for a disproportionate number of deaths from cancer of female genital tract[2].A woman with an enlarging ovarian cancer will not be aware of its presence unless there is noticeable abdominal distention, pain, interference with bowel and urinary function , but by then there is high stage of that cancer . Thus, the outcome is poor and surgical treatment has to be aided by chemotherapy and radiotherapy. Early diagnosis is difficult due to asymptomatic nature ,inaccessible site and limited use of Ultrasound and CT guided FNAC .Not only for primary ,the ovary is favourite site for metastatic abdominal and breast cancers[3].Ovarian cancers has the worst prognosis among all gynecological malignancies .The overall 5-year survival rate is 45%,solely due to late stage at diagnosis .India being the second largest populated country of the world ,has large burden of the disease[4] .

Advanced stage of disease at diagnosis, inappropriate management and poor compliance to therapy are all together responsible for the dismal survival rates[5,6] .The frequency ,clinical appearance and behavior of different types of ovarian tumors is extremely variable. In today's era of advanced chemotherapy and radiotherapy, the best therapeutic approach may be highly specific for a single type of neoplasm, hence clinical evaluation and accurate histopathological diagnosis are often critical factors in achieving a good spectrum of treatment response. Even today simple, cheap non invasive and reliable screening modalities are not available to diagnose ovarian tumors at earliest stage, thus morbidity and mortality is very high. In this scenario, accurate histopathological diagnosis of ovarian tumors by surgical pathologist remains a challenging task. However, over the past two decades, great advances in the knowledge about ovarian tumors, their molecular genetics, histopathologic features and immunohistochemistry have occurred and accordingly new therapeutic modalities have been established and are successful.

## MATERIALS AND METHODS:

A Retrospective study of 200 cases of ovarian tumors was done over three years from January 2017 to December 2019, thus no ethical issues or consent from the patients was taken.

## OBSERVATIONS AND RESULTS:

Total 200 cases of ovarian tumors were studied. All cases were studied with age incidence (table 1) youngest age was 2 years (Yolk Sac Tumor)and oldest was 80 years (Krukenbergs). Maximum cases were found in 4th decade (42%).Cases were also categorized in benign, borderline and malignant groups .Benign tumors were highest (66%), borderline (5%), malignant (27%). Size of benign tumors was less than 10cm and malignant tumors were more than 10cm in size.

**Table no. 1: Age Incidence of Ovarian tumors (n= 200)**

| Age Range | No. of Cases | | | |
|---|---|---|---|---|
| | Benign | Boderline | Malignant | Total |
| 1-10 | 4 | 0 | 6 | 10 |
| 11-20 | 10 | 0 | 5 | 15 |
| 21-30 | 40 | 1 | 6 | 47 |
| 31-40 | 75 | 4 | 8 | 87 |
| 41-50 | 11 | 4 | 13 | 28 |
| 51-60 | 6 | 0 | 0 | 6 |
| 61-70 | 0 | 1 | 4 | 5 |
| 71-80 | 0 | 0 | 2 | 2 |
| Total | 146 | 10 | 44 | 200 |

Clinical presentation at admission was studied in detail .Abdominal pain was the most common symptom (70%) followed by abdominal lump (50%), Gastrointestinal disturbances (20%), vaginal bleeding (18%), Ascites (12%), weight loss (10%), urinary complaints (8%). Parity status was also studied Ovarian tumors were most common in multiparous women (80%), primiparous (13%), nulliparous (7%).

Tumors were also categorized into unilateral & bilateral groups (table no.2).Benign tumors were unilateral (88.7%) & bilateral in (11.3%).All borderline tumors were unilateral (100%).Malignant tumors were unilateral in 75%, bilateral in 25 %.

Interestingly all bilateral malignant serous tumors (40%), showed

ascitic fluid positivity & omental metastasis. Malignant mucinous tumors were bilateral in 30% and all showed ascitic fluid positivity & omental metastasis. Tumors were classified according to WHO classification for ovarian tumor. Surface epithelial tumor were (66.5%), Germ cell tumors (21%), Metastatic (6%) and Sex Cord Stromal Tumors (5.5%) (table no.2).

In surface epithelial tumors Serous were commonest (54.8%), Mucinous (33%), Brenners (6.7%). In Germ Cell Tumor (GCT)–Mature cystic Teratoma was highest (69%), In Sex Cord Stromal Tumor (SCST)- Fibro thecoma was highest (50%). Interesting observation was found for metastatic tumor (krukernbergs) 75% were bilateral and 25% unilateral. Lowest age was 27 yrs whereas highest was 80 years. Ascitic fluid positivity and omental metastatic deposits were seen in 90% cases. Primary site of all 12 cases of krukernbergs was studied - Colon was first site (60%), Stomach (20%), breast (20%).

**Table No. 2: Histological classification of ovarian tumors (n=200) according to WHO classification.**

| Name | No. | U/L | B/L | Age range | Mean age | Ascitic Fluid +ve | Omental Metastasis |
|---|---|---|---|---|---|---|---|
| ***I) Surface Epithelial Tumors*** | **135** | | | | | | |
| **Serous Tumor** | **75** | | | | | | |
| Benign(Cystadenoma) | 59 | 50 | 7 | 16-65 | 48.5 | - | - |
| Borderline Malignancy | 4 | 40 | - | 30-70 | 50 | - | - |
| Serous Cystadenocarcinoma | 12 | 7 | 5 | 38-70 | 54 | 5 | 5 |
| **Mucinous Tumors** | **44** | | | | | | |
| Benign | 36 | 30 | 6 | 17-60 | 38.5 | - | - |
| Boderline | 2 | 2 | - | 40-60 | 50 | - | - |
| Mucinous Cystadenocarcinoma | 6 | 4 | 2 | 40-70 | 55 | 6 | 6 |
| **Endometrioid Tumors** | **4** | | | | | | |
| Malignant | 4 | 2 | 2 | 40-70 | 55 | 2 | 2 |
| **Clear cell Tumors** | **3** | | | | | | |
| Malignant | 3 | 3 | - | 50-70 | 60 | - | - |
| **Transitional cell Tumors** | **9** | | | | | | |
| Benign Brenners | 4 | 4 | - | 30-40 | 35 | - | - |
| Borderline | 4 | 4 | - | 30-50 | 40 | - | - |
| Malignant | 1 | 1 | - | 40-70 | 55 | - | - |
| ***II) Sex Cord Stromal Tumors*** | **11** | | | | | | |
| Granulosa cell Tumor | 4 | 4 | - | 35-45 | 40 | - | - |
| Thecoma Fibromas | 5 | 5 | - | 38-45 | 41.5 | - | - |
| Sex Cord Tumor with Annular | 1 | 1 | - | 40 | 40 | - | - |
| Tubules | 0 | - | - | - | - | - | - |
| Gynandroblastoma | 1 | 1 | - | 45 | 45 | - | - |
| Steroid (Lipid) Cell Tumors | | | | | | | |
| ***III) Germ Cell Tumors*** | **42** | | | | | | |
| Mature Teratoma (Dermoid Cyst) | **29** | 28 | 1 | 16-46 | 39 | - | - |
| Immature Teratoma | 2 | 2 | - | 25-30 | 27.5 | - | - |
| Monodermal (Struma Ovarii) | 1 | 1 | - | 35 | 17.5 | - | - |
| Dysgerminoma | 4 | 4 | - | 34-50 | 42 | - | - |
| Yolk Sac Tumors | 6 | 6 | - | 2-10 | 6 | - | - |
| ***IV) Metastatic*** | **12** | | | | | | |
| Krukenbergs | 12 | 4 | 8 | 27-80 | 53.5 | 10 | 10 |

## DISCUSSION:

In the present study, 200 cases of ovarian tumors are studied with respect to frequency, age incidence, histological features, laterality, omental metastasis and ascitic fluid positivity. Tumors are classified according to WHO classification with respect to origin. Results of this study are compared with previous studies in literature.

1)Majority of ovarian tumors and also Benign ovarian tumors predominate in 3rd and 4th decade similar with studies made by Muley et al[7] ,Nabil u et al[8] ,Khatri R et al[9] and Makwana H et al[10]. 2)Malignant ovarian tumors predominate in 5th and 6th decades in this study ,where as they predominate in 7th decade in the study made by Muley et al[7] ,Khatri R et al[9] Swamy C G et al[3] Pradhan et al[11].Overall age incidence of malignancy has reduced by 10-20 years ,may be the correct explanation for this observation.3) Abdominal pain and lump are the commonest clinical findings in this study similar to all the literature studies as increasing size of tumor induces pressure induced pain and advanced pain is also due to tumor infiltration.4) Multiparous women showed 80% of tumors similar to all literature studied as prolonged continous exposure to hormones plays a key role in tumorogenesis 5) In this study ,unilateral tumors are common with benign(70%) and borderline (100%) counterparts similar to study by Kuldeepa AV K et al[4] , Swamy C G et al[3] , Muley et al[7]. Interesting observation was that Malignant tumors are unilateral in 75% and bilateral in 25% and bilateral malignant tumors also showed 100% omental and peritoneal metastasis,thus explaining advanced stage of tumor.6) Benign tumors are highest (66%) similar to findings by Muley et al[7](74%),Khatri R et al[9] (68%) , Swamy C G et al[3](86%),Pradhan et al[11](66%).7)Borderline tumors (5%) and malignant tumors (27%)are similar to all literature studies compared.8)Surface epithelial tumors are commonest (67%),followed by Germ cell tumors(21%), SCST (5.8%) and metastatic (6.2%) . Muley et al[7] ,Khatri R et al[9] Swamy C G et al[3] , Pradhan et al[11] all had similar observations.9) Serous cystadenoma (29.5%) of ovary is commonest of all ,second is mucinous cystadenoma(22%) and third is Mature cystic Teratoma (14.5%).This is similar observation with study made by Muley et al[7], Kayastha et al[12], Zaman S et al[13], Ashral A et al [14]. However, Pradhan et al[11] found Mature cystic Teratoma to be commonest .This disparity may be explained on the basis of geographical variation of tumorogenesis .10) Krukenbergs tumor are 75% bilateral and 25% unilateral .Bilateral krukenbergs are 80% in study by Al agha O M et al[15] .Both findings are the same .Lowest age for Krukenbergs was 27 years and highest was 80 years .90 % showed omental and peritoneal metastasis . Primary site was colon (60%), Stomach (20%) and Breast (20%) .Stomach was primary site in the study made by Uyeturk U et al[16]. This disparity may be due to geographical variation of type of tumor incidence.

## CONCLUSION:

Ovarian tumors have a varied clinical presentation with respect to age, nature of origin and geographical distribution .Size of benign tumors was less than 10cm and malignant tumors were more than 10cm in size. The incidence is directly related to parity. Multiparous women show 80% of overall tumors. Benign tumors are common in 30-40 years and malignant in 50-60 years. Serous cystadenoma is commonest of benign and Serous Cystadenocarcinoma of malignant tumors. Surface Epithelial Tumors are commonest followed by Germ cell tumors .Age incidence varies from first to 8th decade, hence high index of suspicion and early diagnosis with radiological modalities and histological confirmation can significantly reduce morbidity and mortality Krukenbergs tumors either unilateral or bilateral are commonly seen with colon, stomach and breast malignancies, hence genital organs should be properly evaluated in cases of above malignancies. Peritoneal fluid cytology and omental biopsies should be studied in all ovarian tumors. Opposite ovary should also be evaluated properly as bilaterality is known in benign, malignant as well as metastatic tumors.

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