

Histopathological patterns of Ovarian Tumors



Medical Science

KEYWORDS :Surface epithelial tumors, Germ cell tumors, Sex-cord stromal cell tumors, Borderline tumor.

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ABSTRACT

Introduction: Ovarian Tumors (OT) account for fifth most common cause of cancer related death in females. It accounts for 6% of all cancers. Though it is one of the treatable cancers due to its sensitivity to anticancer therapies, it frequently does not result in symptoms until the cancer has spread extensively.

Objectives: To study the incidence, histopathological spectrum and clinical correlates of OT at tertiary care teaching hospital.

Methods: A study was undertaken during a period of one year (1st Jan 2013 - 31st Dec 2013). The tumors were classified according to WHO classification after thorough examination of H&E slides. Data on clinical presentation were recorded in each case.

Results: There were a total of 83 cases. Surface Epithelial Tumors (SET) emerged as the commonest variety accounting for 47%, followed by Germ Cell Tumors (GCT) (45.8%). Sex Cord Stromal Tumors (SCST) and metastatic tumors accounted 3.6% each. The age range was 10- 86 years. Metastatic tumors involved younger age groups. Abdominal mass was the commonest clinical presentation followed by pain in abdomen.

Conclusion: OT were found to occur in wide range of age (10-86 years) with abdominal mass and pain abdominal pain being the commonest clinical presentation. SET and GCT together constitute the majority of the case (92.8%). An accurate histological diagnosis and staging is therapeutically and prognostically important.

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Introduction

OT include wide spectrum of neoplasms involving epithelial tissues, connective tissues, specialized hormone secreting cells, germinal and embryonal cells¹. These are treatable tumors because of sensitivity to anticancer therapies². It accounts for 6% of total cancers in female and is the 5th most common form of cancer related death in females and almost half of the deaths from gynecological cancer. The disease has highest fatality-to-case ratio to all the gynecologic cancers². The risk of developing Ovarian Cancer is highest around the age of 55. The benign tumors mostly occur in young women between ages of 20 and 45 whereas the malignant tumors are common in older women between ages of 40 and 65. The incidence is high in postmenopausal women, unmarried women or in married women with low parity³. It is estimated that about 1 in every 70 women have a life time risk of developing ovarian cancer. Unfortunately, the survival rate is < 50% because screening test has not yet been developed and the disease is not very symptomatic⁴. The aim of this study was to study the incidence, histopathological spectrum and clinical correlates of OT.

Material and methods

This study was done within a period of one year (2013) in the tertiary care teaching hospital.

A detailed history, clinical examination, routine laboratory investigation were obtained.

The specimens were fixed in 10% formalin. After sectioning tissues were processed in an automated tissue processor and paraffin blocks were made. The tissue sections were cut and stained by H&E, then examined under a light microscope. The histopathological diagnosis was based on morphologic features and the tumors were classified according to WHO classification.

Results

A total of 83 cases were studied out of which 66 cases (79.5%) were benign, 2 cases (2.4%)

borderline and 15 cases (18%) malignant (Table 1):

Table 1:

Categories	Number of cases(Percentage)
Benign	66(79.5%)
Borderline	2(2.4%)
Malignant	15(18%)
Total	83(100%)

These tumors were categorized into 4 main groups. SET constituted majority of the ovarian neoplasm with 39 cases (46.9%), followed by GCT which constituted 38 cases (45.7%). SCST and Metastatic tumors constituted 3 cases (3.6%) each (Table 2):

Table 2:

Histopathological type	Number of cases (Percentage)
Surface epithelial tumor	39(46.9%)
Germ cell tumor	38(45.7%)
Sex cord stromal tumor	3(3.6%)
Metastatic tumor	3(3.6%)
Total	83(100%)

Among the total benign tumors 66 (79.5%), GCT comprised the commonest 33 (50%) followed by SET 31 (47%) and SCST 2 (3%) (Table 3):

Table 3:

Benign Tumors	Number of cases(Percentage)
GCT	33(50%)
SET	31(47%)
SCST	2(3%)
Total	66(100%)

Borderline tumors 2 (2.4%) comprised of the surface epithelial tumors.

Among the total malignant tumors 15 (18.1%), 12 (80%) were primary malignant tumors and 3 (20%) were secondary tumors.

The commonest malignant tumor was from the SET 6 (40%) followed by GCT 5 (33%), metastatic tumors 3 (20%) and SCST 1(7%) (Table 4):

Table 4:

Malignant tumors	Number of cases(Percentage)
Primary	12(80%)
-SET	6(40%)
-GCT	5(33%)
-SCST	1(7%)
Secondary	3(20%)
-Metastatic	
Total	15(100%)

The age group ranged from 10-86 years with the mean age of 39.1 year.

Commonest clinical presentation was distension of abdomen and mass in the lower

abdomen, followed by abdominal pain. Irregular bleeding per vagina was seen in 12 cases. Ascites and urinary symptoms were seen in 3 malignant cases. Loss of weight was a common presentation of malignant tumors comprising of 8 cases. Symptoms related to torsion were seen in 3 cases and one incidental finding of ovarian tumor in patient who had presented with strangulated bowel obstruction.

Gross pathology: Majority of the tumors were cystic 37(44.5%) followed by solid 11 (13.2%) and mixed 35(42%).

Benign group: 28(42.1%) cystic, 3(4.8%) solid and 35(32.5%) mixed.

Borderline: Both cases were cystic.

Malignant: Mixed being 8 (9.6%) and Solid 7 (8.4%).

Unilateral tumors were observed in 65 (78.3%) cases. Involvement of left ovary (65%) was more common than the right (35%). Bilaterality was seen in 18 cases (22%) (Table 5):

Table 5:

Site	Number of cases (Percentage)
Unilateral	65(78.3%)
Bilateral	18(22%)
-Left	-10(65%)
-Right	-8(35%)

Bilaterality was seen in 11 (16.6%) benign cases, 1 (50%) borderline and 5 (33.3%) malignant cases.

Histopathology

SET

Largest group of the total OT (46.9%) with 31 benign, 2 borderline and 6 malignant cases.

Serous tumors: Commonest comprising 17 (21.6%) of OT and 22(46.15%) of all SET. Serous Cyst adenoma showing cysts lined by single layers of ciliated columnar epithelial cells comprised of 30.76%.one case of borderline serous tumors. Serous Cystadenocarcinoma (10.25%) was the commonest malignant epithelial tumors. These tumors showed papillary structures with fibrovascular cores, complex glands, solid sheets and nests of tumor cells with diffuse invasion of the stroma. Variable amount of hemorrhage and necrosis seen

Mucinous tumors: Second commonest among SET (38.4%) and constituted 38.4% of OT. Mucinous Cyst adenoma composed of multiloculated cysts lined epithelial cells with apical mucin was

the commonest followed by one case of borderline and two cases of malignant mucinous tumor.

Benign Brenner tumor: 2 cases (5%) of SET and 2.4% of OT.

Mixed: 4(10.2%) of all SET and 4.8% of OT. All the 4 cases had components of mucinous tumor with 2 cases mixed with mature cystic teratoma, one with serous and one with Brenner tumor.

GCT

Second commonest tumor 38 (45.7%) of OT. It showed 33 (86.8%) benign and 5 (13.1%) malignant cases. Teratoma constituted 92%, among which mature cystic teratoma (92.1%) was commonest. There were two cases of immature teratoma. There was one case of Struma ovarii, constituting 29% of total teratoma. Only 2 cases of dysgerminoma and one case of yolk sac tumor were observed.

SCST

3 cases (3.6%) of OT. Among the benign Ovarian Tumors it constituted 33.3% and of all malignant ovarian tumors it constituted 66.7%.

One case each of Fibroma and Fibroma-thecoma were observed. A single case of Sertoli - Leydig cell tumor was noted .

Metastatic tumors

Metastatic tumor constituted the least number 3(3.6%), all of them were Krukenberg tumors.

Discussion

OT has become increasingly important because of its large variety of histomorphological patterns and increased the mortality rate. The incidence, clinical appearance and the behavior is extremely variable. It is impossible to diagnose nature of the ovarian tumor preoperatively just by clinical examination and exploration. Hence, microscopic appearance is important for further management.

Incidence

A total of 83 cases were documented, out of which benign tumors (79.5%), borderline (2.4%) and malignant tumors (18%). Similar results were seen in studies by Pilli et al15 and Nowak et al18 where incidence of benign, borderline and malignant OT comprised of 75.2%, 2.8%, 21.9% and 79.5%, 2.1% and 18.4% respectively. Reverse result was shown by Tyagi et al12 where malignant tumors outnumbered benign tumors. A higher incidence 40.81% of malignant tumors was shown by Ahmad et al14 in comparison to other studies. Thanikasalam et al11 showed similar frequency of borderline tumor (2%) as seen in our study.

Nature of the tumors

SET constituted majority with (47%), followed by GCT of (45.8%), SCST of 3 (3.6%) and metastatic tumors of 3 (3.6%) cases, similar to results of many studies. 6,7,9,15,17,18.

Among benign lesions, GCT was commonest (50%), followed by SET (47%) and SCST (2.4%) similar to many studies. Mature Cystic Teratoma comprised commonest of all benign tumors in our study (48.4%). similar to the study conducted by Ahmed et al14 (35.17%), whereas Di Bonito L et al8 reported epithelial tumors to be the commonest.

The commonest malignant tumor in this series were of SET (40%), followed by GCT (33%), metastatic tumors (20%) and SCST (7%). This finding is similar to findings of Shy et al17 and Di et al8 In this study Serous Cystadenocarcinoma constituted most common malignant tumor (26.6%) as shown by various other studies.13,14,19.

Age

Age range was 10 - 86 years with mean age of 39.1. Similar results were reported by Ahmed et al¹⁶ and Chow et al¹⁷, Sarkar¹³.

Site of involvement

Unilateral (78%) involvement was more common than bilateral (22%) coinciding with the findings of other studies^{5,17}. Involvement of left ovary (65%) was more common than the right (35%). Reverse was seen in study by Tyagi et al¹² and Fusey et al²¹.

Gross

Majority were grossly cystic 44.5% followed by solid and mixed tumors. Majority of benign groups were cystic 42.1%. In malignant group solid and mixed tumors were common. This goes in agreement with findings of Fusey et al²¹ who reported that most of the cystic swellings were either benign or non neoplastic while almost all solid and mixed tumors were malignant. Chhanda et al¹⁰ in a 10 years study of ovarian tumors revealed that in the benign group majority of the cases were cystic 86.7%. While in malignant group majority cases 69.2% were solid.

Clinical presentation

The most common was of mass per abdomen with distension and abdominal pain. This is in agreement with majority of studies^{6,12,20,21}. Irregular bleeding per vagina was third common finding as seen in by Fusey et al²¹. Pregnancy was associated in 6% of cases, an exact incidence of 6% by Bhattacharya et al⁶. Symptoms related to torsion were seen in 3.6% of cases, a similar incidence of 4.8% shown by Bhattacharya⁶. In malignant cases, loss of weight 9.6% was a common, followed by ascites and urinary symptoms with 3.6% each. In a study of Bhattacharya et al¹⁰, ascites constituted half of malignant OT.

Histopathology

SET: SET (46.9%) constituted the most common of OT, similar to various studies^{6, 7,9,10,12,13,22}. Serous tumors (46%) constituted commonest tumor among SET as shown by many studies^{5,13,15}. Serous Cyst adenoma (66.6%) was the most common among the serous tumors. An observation identical to Maheshwari V et al²².

Mucinous tumors: (38.4%) constituted the second common SET in this study as stated by Chauhan AS et al²³. Maheshwari et al²² reported that Mucinous Cyst adenoma comprised the second commonest 30.8% of all SET. Among the Mucinous tumors, 12 (80%) were benign, 1 (6.7%) borderline and 2 (13.3%) malignant.

Borderline tumors: We had one case each of serous and mucinous tumor. In study by Bostwick et al, 67% were of serous, 27.5% mucinous and 5.5% seromucinous.

Brenner tumor: 5% of all SET and 2.4% of all OT in this study. Literatures suggest its incidence as 2% of all OT. Maheshwari et al²² found its incidence to be 1.18% of all SET. In our study, out of two cases, one was an incidental finding. Silverberg²⁵ also reported that 5 of 54 Brenner tumors were an incidental finding

Mixed: Of all SET, 10.2% showed mixed nature. Histologically all cases contained Mucinous Cyst adenoma mixed with Mature Cystic Teratoma in 2 (50%) cases, with serous and Brenner in one (25%) case each.

GCT: Second most common (45.7%) of all OT similar to findings of many other studies^{10,13,14,17,19,21,22}. Among benign tumors, this group was commonest. It constituted the second commonest (33.3%) among total malignant tumors like in many studies^{9,17}. Teratoma was commonest (92%). Immature Teratoma constituted 60% of all GCT. Struma Ovarii constituted 3% of all OT; agreeing with literature, its incidence as 1.3% of all benign OT. It is characterized by presence of thyroid tissue in an ovarian stroma.

Dysgerminoma had youngest group of patients comprising 5.2% of GCT and 2.4% of all OT²⁶. Tumors presented in solid nests and sheets separated by variable amount of fibrous strands infiltrated by lymphocytes.

Yolk Sac Tumor comprised 3 % of GCT, findings similar to many studies^{10,26}.

SCST: 5-8% of all OT but our study showed a lower incidence (3.6%)-incidence very close to the finding of Salvi V²² (3.3%). There was each case of Fibroma, Fibroma-Thecoma and Sertoli-Leydig cell tumor.

Metastatic tumors: Involve the ovaries, more than any other site in female genital tract comprising 10% of all malignant OT. 5 Incidence of 3.6% of all OT were observed, similar to many studies^{6,10,12}. Pilli et al¹⁵ have shown a smaller incidence rate of 0.7% only. All the metastatic tumors were diagnosed as Krukenberg tumor.

Conclusion

Ovarian cancer presents a tremendous clinical challenge. It is a silent menace and is not associated with significant symptoms. It is not easily detected by physical or laboratory examination; hence one has to depend in microscopic appearance for further management. Ovarian malignancies occur at all ages. This study has shown occurrence of younger age groups in the primary malignant OT and the metastatic tumors. Hence this study emphasizes that in a young female with ovarian mass, possibility of malignancy and metastatic tumors should not be neglected.

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