

Clinicopathological study of ovarian tumors: A 5 year study

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Abstract

A wide spectrum of neoplasms are encountered in the ovary because of the totipotential and multipotential capacity of ovarian germ cells and mesenchymal cells. Ovarian neoplasms are the cause of highest mortality in female genital tract neoplasms.

Aim: this study was undertaken to assess the age distribution, presentation and the morphological variants of ovarian neoplasms.

Materials and Methods: a retrospective and prospective study was undertaken in the department of pathology from January 2013 to December 2017.

Results: out of 105 cases analysed, 98.10% were primary ovarian neoplasms while 1.90% were metastatic tumors. Majority, 85.71% were benign while 8.57% were malignant. Commonest tumors were the surface epithelial tumors (72.38%) followed by 18.09% germ cell tumors and 7.61% sex cord stromal tumors. Benign tumors were common in 4th decade while malignant were common in the 5th decade. The most common presenting complaint was pain in abdomen.

Conclusion: Evaluating the exact morphological type is essential in today's era of targeted therapy for cancer. Further studies on larger population groups are essential to evaluate the outcome with respect to histopathological typing, grading and staging of ovarian tumors.

Keywords: Ovarian tumor, Histopathology.

Introduction

Ovarian malignancies represent the greatest clinical challenge in gynaecology. The ovary appears remarkably resistant to any form of disease except tumors. The burden of ovarian tumors is next to cervical and uterine cancers in Indian females. Indian cancer registry data project ovary as an important site of cancer comprising upto 8.7% of cancers in different parts of the country.¹

Though a small organ, ovary has been described to have enormous differentiating potential responsible for a profound variety of tumors.² Different subtypes of ovarian tumors differ with respect to risk factors, precursor lesions, pattern of spread and natural history and response to treatment. In effect, they are different diseases which have a common manifestation of ovarian mass. With progress toward subtype-specific treatment of ovarian carcinoma, accurate, reproducible histopathological diagnosis of these subtypes by pathologists is increasingly important.³

The present study was undertaken to view the scenario of ovarian tumors with respect to clinical presentation, gross and microscopic characteristics at Government Medical College and Hospital, Latur.

Material and Methods

A cross sectional observational study was carried out in the department of pathology, GMC&H Latur, Maharashtra in which cases of ovarian tumors from January 2013 to December 2017 were studied. A total 105 specimens of ovarian tumors were included in the

present study. All data was tabulated using Microsoft Excel 2007 and analysis was done.

Observations and Results

Tumors were studied for clinical features, age distribution, gross and microscopic findings.

Of the total tumors studied, surface epithelial tumors were the commonest (72.38%) followed by germ cell tumors (18.09%) and sex cord stromal tumors (7.61%). Metastatic tumors to the ovary were the least common (1.90%). (Fig. 1)

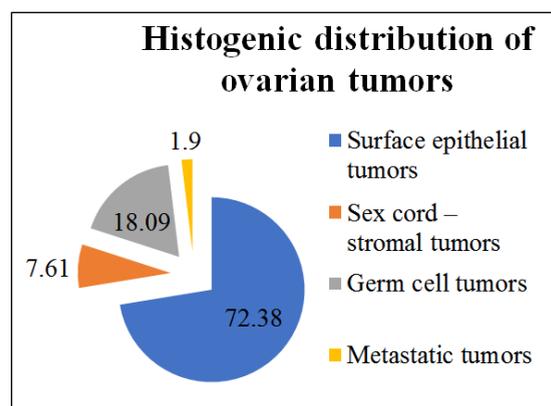


Fig. 1

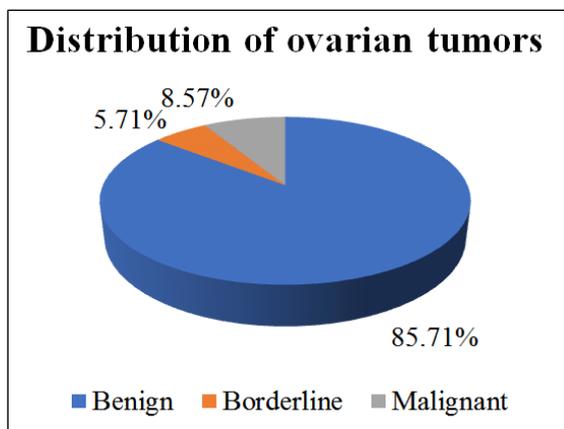


Fig. 2

Majority of tumors were benign (85.71%) while malignant tumors accounted for only 8.57%. (Fig. 2)

Amongst the surface epithelial tumors, benign tumors formed a major chunk (89.47%). Most cases were benign serous cystadenoma. Borderline and malignant surface epithelial tumors both accounted for 5.26%. Among germ cell tumors, 94.73% were benign mature teratoma. Among sex cord stromal tumors 50% were benign fibromas.

Considering the age distribution pattern, average age of presentation was 38 years with eldest case of 81 years female and the youngest of 14 years female. Benign tumors were common between 31 to 40 years (33.33%) followed by 21 to 30 years (31.11%). Malignant tumors were found to be most common in the 5th decade although malignant sex cord stromal tumors and malignant germ cell tumors were seen in the second decade. Metastatic tumors were common in the age group of 40 to 50 years.

The most common presenting complaint was pain in abdomen (47.61%) followed by lump in abdomen (28.57%). Menstrual irregularities like menorrhagia, polymenorrhoea were complained by 7.61% of cases. (Table 1)

Table 1: Distribution of cases as per presenting complaint

Presenting complaints	Benign		Borderline		Malignant		Total	
Asymptomatic	4	3.80%	0	0%	0	0%	4	3.80%
Pain in abdomen	45	42.85%	3	2.85%	2	1.90%	50	47.61%
Lump in abdomen	24	22.85%	2	1.90%	4	3.80%	30	28.57%
Vague abdominal discomfort	5	4.76%	0	0%	0	0%	5	4.76%
PV bleed/ menstrual disturbance	6	5.71%	1	0.95%	1	0.95%	8	7.61%
GI disturbance	2	1.90%	0	0%	1	0.95%	3	2.85%
Urinary complaints	0	0%	0	0%	1	0.95%	1	0.95%
Leucorrhoea	4	3.80%	0	0%	0	0%	4	3.80%
Total	90(85.71%)		6 (5.71%)		9 (8.57%)		105 (100%)	

Maximum patients presented with symptoms ranging between 1 to 6 months (59.04%). 29.52% cases had acute presentation (1 to 4 weeks). Occurrence of malignant tumors was equal among nulliparous and multiparous women (3.80%). However benign and borderline tumors were more common in multiparous women. Right ovary was more commonly involved (49.52%) than left ovary (41.90%). 8.57% of tumors were bilateral. Both metastatic tumors studied were found to involve bilateral ovaries.

Gross tumor size showed wide variation. Most benign tumors on gross were 5 to 10cm (40.95%). Malignant tumors were most commonly in the range of 10- 15cm (3.80%). Benign mixed epithelial tumor (mucinous with Brenner component) was found to be the largest tumor. Benign serous and mucinous tumors were found to be larger than other benign tumors.

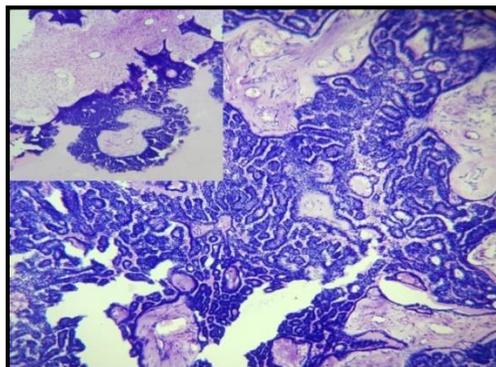
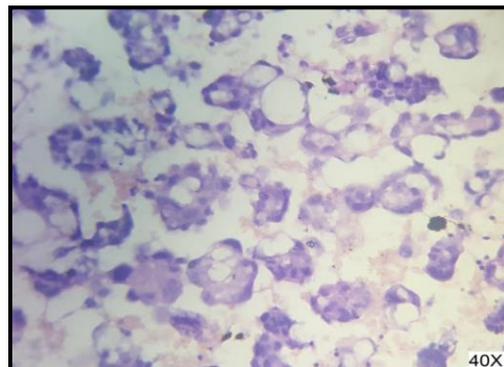
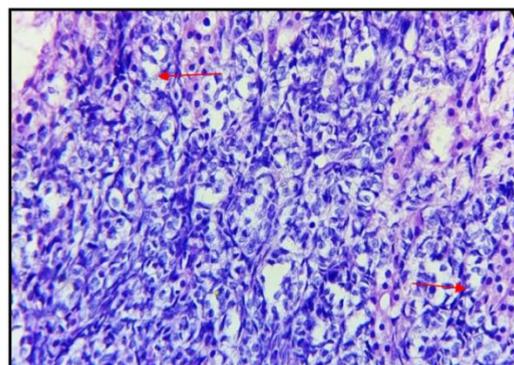
Out of the total specimens studied, 88.57% were cystic on gross morphologic examination. 7.61% were solid while 5.71% were partly solid and partly cystic.

Among microscopic types, benign serous cystadenomas were the most commonly encountered tumors accounting for 47.61%. Mature teratomas accounted for 16.19% while benign mucinous cystadenomas accounted for 15.23%. Among borderline and malignant tumors, surface epithelial tumors were commonest. (Table 2)

Most of the benign cases underwent cystectomy. Cases of benign tumors who underwent hysterectomy with salphingo-oophorectomy showed adenomyosis and leiomyomas as common associations. Six of the nine malignant ovarian tumor cases underwent total abdominal hysterectomy (TAH) with or without additional omental sampling. Two cases of juvenile granulosa cell tumor and single case of dysgerminoma were young nulliparous females in whom fertility sparing was essential. Most (7 out of 9 cases) malignant tumors were operated late in their course ie tumor stage was beyond pT1.

Table 2: Comparison of distribution of different types of ovarian tumors

S. No	Microscopy	Present study 105 cases	Badge et al (2013)	Vadatti et al (2013)
1	Benign serous tumor	47.61%	33%	50.72%
2	Benign mucinous tumor	15.23%	23%	16.90%
3	Benign Brenner tumor	0.95%		1.26%
4	Benign mixed epithelial tumor	0.95%	-	-
5	Borderline serous tumor	2.85%	2%	-
6	Borderline mucinous tumor	0.95%	1%	-
7	LGSC	0.95%	10%	10.79%
8	HGSC	0.95%		
9	Endometrioid carcinoma	1.90%	1%	0.84%
10	Granulosa cell tumor	1.90%	2%	1.08%
11	Fibroma	3.80%	1%	27.28%
12	Sertoli leydig cell tumor	1.90%	-	-
13	Mature teratoma	16.19%	12%	66.67%
14	Monodermal teratoma	0.95%	1%	3.70%
15	Dysgerminoma	0.95%	3%	18.53%
16	Metastatic tumors	1.90%	1%	1.09%

**Fig. 3: Borderline serous tumor with micropapillary pattern (10x)****Fig. 5: Cell block preparation of ascitic fluid from a case of serous carcinoma- positive for malignant cells****Fig. 4: Serous carcinoma showing papillary growth pattern and nuclear atypia****Fig. 6: Sertoli Leydig cell tumor of intermediate differentiation showing ill defined tubules and Leydig cells(↓)**

Discussion

In the present study, majority of ovarian tumors were benign (85.71%), borderline tumors accounted for 5.71% while malignant tumors accounted for 8.57% of all tumors.

Similar distribution of tumors were reported by Yogambal et al (2014),⁴ Mondal et al (2017).⁵ In the present study, a lesser percentage of malignant tumors were reported possibly due to referral of cases to higher centre or late presentation (inoperable cases).

Among benign tumors the most common tumors were benign serous cystadenomas (46.61%) followed by mature cystic teratomas (16.19%) and mucinous cystadenomas 18(15.23%). These findings are in concordance with the findings reported by Yogambal et al (2014) and Mondal et al (2017).

Nulliparity is considered to increase the risk of ovarian cancer.⁶ In our study we found 11.42% women were nulliparous while the rest had single or multiple conceptions. Among cases with malignant tumors 3.8% were nulliparous and an equal percentage were multiparous. Hiremath et al (2012) reported that parity altered the occurrence of ovarian carcinoma with 35% cases nulliparous followed by 25% cases as para 1, 17.5% cases as para 2, and 7.5% cases as para 3.⁷

Oral contraceptives have been believed to be protective for ovarian cancer.⁶

In present study, none of the women reported to have consumed oral contraceptive pills for a duration of more than 6 months.

Tubal ligation is also implicated as a protective factor for ovarian cancer more importantly for clear cell and endometrioid tumors.⁸

In our study 58.09% women had not been tubectomised. 2 cases of endometrioid carcinoma had not underwent tubal ligation. Due to small study population of this hospital based study, no statistical significance could be obtained with respect to any of the risk factors.

Benign mixed epithelial tumor was the largest tumor in the present study (23cm). Among malignant tumors, none of the tumors were found to be more than 20 cm. Average tumor size reported in present study was 9.95 cm. Sheikh et al (2017) reported an average tumor size of 9.39 cm similar to the present study.⁹

Of the total cystic tumors, 90.32% were benign and only 4.3% were malignant. Thakkar et al (2015) reported 97.33% of cystic tumors to be benign.¹⁰

Sheikh et al (2017) reported all cystic tumors to be benign. However in our study we found 4.3% of cystic tumors to be malignant in nature (2 cases of serous carcinoma, one endometrioid carcinoma and one juvenile granulosa cell tumor).

Surface Epithelial Tumors: We observed benign serous cystadenoma as the commonest tumor type (47.61%) followed by 15.23% benign mucinous cystadenoma. We reported a single case of benign Brenner tumor and single case of benign mixed epithelial tumor with mucinous and Brenner component. Similar trend was noted by Badge et al (2013)¹¹ and Mondal et al (2014). Out of the 50 benign serous tumors, 2 cases were of serous cystadenofibromas, 1 case of surface papilloma and 8

cases showed papillary excrescences within the cyst. 33 cases showed unilocular cystic tumor while 17 tumors were multilocular cysts. The mean age of presentation for benign serous tumors was 38 years. The eldest case was 45 years and the youngest 14 years of age. Average size was 9.95cm. 54% cases presented as pain in abdomen and 28% as lump in abdomen. Five cases presented as acute abdomen due to torsion of the ovarian mass. Among all primary ovarian tumors 3.88% of benign serous tumors were found to be bilateral. In the study by Vadatti et al (2013)¹² benign serous tumors were bilateral in 3.54% of all primary tumors, similar to the present study.

In our study 2.85% cases were serous borderline tumors. One case of serous borderline tumor showing micropapillary pattern. The tumor involved both ovaries. It is believed that micropapillary architecture confers an adverse prognosis and some recommend labelling such cases as micropapillary carcinoma.¹³

In our study we found 1.90% cases of serous carcinoma which is low as compared to other studies. Ascitic fluid cytology was positive for malignant cells in both cases and one case showed tumor deposits in omental tissue.

In our study we found 15.23% cases of benign mucinous tumors, single case (0.95%) of borderline mucinous tumor and no case of malignant mucinous tumor. This is in accordance with the data published by Kurman RJ (2011)¹⁴ who stated that next to serous carcinomas, endometrioid and clear cell tumors account for 15-20% of all epithelial ovarian cancers and mucinous carcinomas are relatively rare accounting for only 3% of all epithelial ovarian cancers, if metastasis to the ovary is carefully excluded. Mucinous cystadenomas showed gastrointestinal type of epithelial lining in maximum cases.

We received 2 cases of endometrioid carcinoma. One was reported as well differentiated type and was an entirely solid yellowish mass grossly. The other was a unilocular cystic mass adherent to the uterus and was diagnosed as poorly differentiated type.

We reported a single case of benign mixed epithelial tumor with mucinous and Brenner components both accounting for >10% and hence was reported as a mixed epithelial tumor.¹³ This was the largest tumor reported in our study measuring 23 cm in its largest dimension, showed solid and cystic areas in a patient of 81yrs. Similar to our findings, Seidmann JD and Khedmati F(2008) reported that after extensive sectioning 18% of mucinous tumors reveal areas of Brenner tumor. Cases have a median age of 71years and size range of 1- 27cm.¹⁵

Germ Cell Tumors: The most common tumors in this category were mature cystic teratomas accounting for 16.19% cases. The mean age was 36 years and pregnancy was an association in two cases. Papadias K et al (2005) reported a median age of 35 and pregnancy was present in 3% of cases.¹⁶ On microscopy skin

adnexa, GI epithelium, cartilage, fat and bone were a common finding, similar to that reported by Vadatti et al (2013). In the present study, of the 17 mature teratomas, ten cases were reported as dermoid cysts. Grossly, nine tumors showed pultaceous material and calcific foci while eight showed tuft of hair. Single case of struma ovarii was reported and patient did not have any features of thyrotoxicosis.

Among malignant germ cell tumors, dysgerminoma accounted for 0.95% (single case) in our study. Grossly tumor was tan yellow, solid and tumor cell emboli were noted in omental blood vessels (pT3) in nulliparous female of 15yrs.

Sex Cord Stromal Tumors: The most common tumor in this category was fibroma accounting for 3.80%. All had solid white to yellow appearance on cut surface and were mistaken for leiomyoma on pre-operative ultrasonography.

We also encountered 2 cases of Sertoli Leydig cell tumor (1.90% of all cases). Mean age was 25.5 years. Both presented with menstrual disturbances and PV bleeding. Microscopically both tumors showed features of intermediate differentiation. Both cases were considered as borderline tumors as tumors of intermediate differentiation have a malignant potential of 10-11%.¹⁷

We encountered 2 cases of juvenile granulosa cell tumor (1.90%). Both occurring in 18 year old unmarried females. Microscopy showed more than 4-5 mitoses per 10 hpf and also tumor cells were seen infiltrating through the capsule. Based on gross tumor size and microscopic picture, they were considered as malignant tumors.^{18,19} Bodal et al (2014)²⁰ reported 1.67% cases of granulosa cell tumors comparable to our study.

Metastatic Tumors: In our study we reported 2 cases of metastatic tumors to the ovary. One case of rectal adenocarcinoma metastasising to both ovaries and the appendix. Other case was serous adenocarcinoma of the endometrium metastasising to the ovary in a 65 year old female.

Conclusion

Ovarian tumors constitute a major burden among women presenting to the gynecological OPD. To conclude we recommend microscopic histopathological examination of every ovarian mass as gross morphology of tumors and pre operative imaging modalities like ultrasonography are not definitive. Targeted therapy depending on the type of tumor is essential to improve outcome in cases of ovarian tumors emphasizing the need for microscopic histopathological examination and grading in every case of ovarian tumor.

We also emphasize the need for follow up studies in order to assess the importance of pathological grading and staging with respect to clinical outcome.

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