International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2020; 3(1): 179-182
Received: 20-11-2019
Accepted: 24-12-2019

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Histopathological spectrum of ovarian tumors: A study of 53 cases

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DOI: https://doi.org/10.33545/pathol.2020.v3.i1c.173

Abstract
Background: Ovarian malignancies are one of the most common malignancies affecting women. Worldwide, it is the sixth most common cancer overall and second most common among gynecological cancers. It consists of 4% of all female cancers and 23% of all gynecological cancers. In India, it comprises 8.7% of cancers in different parts of the country. About 80% are benign and occur in younger age group and malignant tumors occur in older age group. The purpose of the study was to study the frequency of ovarian tumors in relation of age distribution, laterality, histological subtypes and histomorphological spectrum.
Methods: This one year retrospective study included fifty-three (53) cases of ovarian tumors. All the resected specimens received either as solitary specimens or as a part of pan hysterectomy in the laboratory were included in the study. After detailed study of sections under the light microscope the final diagnosis was arrived and were classified according to the WHO classification of ovarian tumors.
Results: Of the 53 cases majority were malignant tumors 71.70% (38 cases) with serous carcinomas being more common. Majority of the malignant tumors were seen bilaterally and more common in older age groups. Benign tumors were more common in younger age groups.
Conclusion: The ovarian tumors being one of the major gynecological challenge to medical fraternity. However, benign tumors are more common in the younger age group and malignant tumors in older age group. Hence early detection of ovarian tumors is very crucial in reducing the morbidity and mortality of the patients.

Keywords: ovarian tumors, serous carcinoma, surface epithelial tumors.

Introduction
The ovaries are paired adnexal organs located on either side of uterus and are common site for neoplasms in women [1]. The ovaries consists of totipotent sex cells and multipotent mesenchymal cells which plays an important role in occurrence of wide spectrum of neoplasms having variety of morphological diagnosis ranging from tumors arising from epithelial tissue, connective tissue, germ cells, embryonic cells and metastatic non-ovarian cells [1, 2].
Ovarian malignancies are one of the most common malignancies affecting women [3, 4]. Worldwide, it is the sixth most common cancer overall and second most common among gynecological cancers. It consists of 4% of all female cancers and 23% of all gynecological cancers [3, 4, 5]. In India, it comprises 8.7% of cancers in different parts of the country. About 80% are benign and occur in younger age group and malignant tumors occur in older age group. Important etiological factors being increasing age, positive family history, increase age of reproduction, high socio-economic status and nulliparity [6].
The diagnosis of ovarian tumors depends on age, clinical presentation, radiological findings and tumor maker study. However, definitive diagnosis and staging is done by histopathological examination and immunohistochemistry whenever necessary.
The purpose of the study was to study the frequency of ovarian tumors in relation of age distribution, laterality, histological subtypes and histomorphological spectrum.

Materials and methods
This one year retrospective study included fifty-three (53) cases of ovarian tumors diagnosed between January 2016 and December 2016. All the resected specimens received either as solitary specimens or as a part of pan hysterectomy in the laboratory were included in the study.

The normal ovaries and ovaries with other findings such as cystic follicle, follicular Cyst, surface epithelial inclusion cyst, hemorrhagic cyst, chocolate cyst and ectopic gestation were excluded from the study.

The specimens received were immediately fixed in 10% formalin for at least 24 hours. Gross features of specimen were noted and multiple representative sections were taken for routine processing. Paraffin embedded of sections of 4 micrometer were taken and stained with Hematoxylin and eosin (H&E). After detailed study of sections under the light microscope the final diagnosis was arrived and were classified according to the WHO classification of ovarian tumors. The patient details like age, sex, clinical diagnosis were obtained from the requisition forms that were sent along with the specimen.

Results

A total of fifty-three (53) cases of ovarian tumors (chart 1) were studied with age ranging from 17 years to 76 years which constituted 12 (22.64%), 3 (5.66%) and 38 (71.70%) of benign, borderline and malignant tumors respectively. Table 1. The malignant tumors were seen bilaterally in 20 (52.63%) cases and benign lesions were seen on the left side in 7 (58.33%) cases. Table 2.

Majority of the malignant tumors, 15 (39.47%) cases were seen in the age group of 47-56 years. The youngest patient was a case of mature teratoma and the oldest case was serous carcinoma. In the younger age group, benign lesions were more common whereas malignant tumors were mainly found in the age >37 years. Table 3

Histologically, surface epithelial tumors were the most common 43 (81.13%), followed by sex cord-stromal tumors 5 (9.44%), germ cell tumors 3 (5.66%), and metastatic tumors 2 (3.78%). The most common surface epithelial tumor was serous tumors, 35 cases followed by mucinous tumors, 5 cases and endometroid tumor, 3 cases. Of the 5 (9.43%) sex cord stromal tumor, 4 were granulosa cell tumor and 1 was thecoma/fibroma. Among 3 (5.66%) germ cell tumors all were mature teratomas. Metastatic (Krukenberg) tumor comprised of 2 (3.78%) cases. Table 4.

Table 1: Distribution of type of tumor

Type of tumor	Numbers (n)	Percentage (%)
Benign	12	22.64%
Borderline	3	5.66%
Malignant	38	71.70%
Total	53	100%

Table 2: Side distribution according to the type of tumor

Type of tumor	Bilateral	Left	Right	Total
Benign	3	7	2	12
Borderline	-	1	2	3
Malignant	20	10	8	38
Total	23	18	12	53

Table 3: Age distribution according to the type of tumor

Age Group	Benign	Borderline	Malignant	Total
17-26	2	-	-	2
27-36	1	2	1	4
37-46	4	1	8	13
47-56	3	-	15	18
57-66	1	-	8	9
67-76	1	-	6	7
Total	12(22.64%)	3(5.66%)	38(71.70%)	53(100%)

Table 4: Histological types of ovarian tumors

Type of tumor	Number (%)
Surface epithelial tumor	43 (81.13)
Serous tumors	35
Benign	5
Borderline	3
Malignant	27
Mucinous tumors	5
Benign	3
Malignant	2
Endometroid tumor	3
Sex cord stromal tumors	5 (9.44)
Granulosa cell tumor	4
Thecoma / fibroma	1
Germ cell tumors	3 (5.66)
Mature teratoma	3
Metastatic tumors	2 (3.77)

Discussion

Ovarian tumors are one of the major female genital system problems and it poses great difficulty in diagnosis as a result of varied pathological conditions affecting ovaries. Hence the knowledge of morphology and age specific characteristics can help in refining the diagnosis [8, 9, 10].

In the present study, the most common malignant tumor was serous carcinoma 27 (50.94%) which is in concordance with study carried out by Gupta N *et al.*, [3] Garg N *et al.*, [8] Kanpurwala SH [11] *et al.*, Modepalli N *et al.*, [12] and most common borderline tumor was borderline serous tumor similar to study conducted by Mondal SK *et al.*, [10] The malignant ovarian tumors were seen bilaterally in majority of the cases i.e. 20 (52.63%) out of 38, similar to the study findings by Gupta N *et al.*, [3] The metastatic tumors constituted 2 (3.77%) cases, both being Krukenberg tumor which is in concordance with study by Garg N *et al.*, [8] Bhagyalakshmi A *et al.*, [13] Jha R *et al.*, [14] and Gupta N *et al.*, [15].

Majority of the benign tumors occurred in the younger age group and the malignant tumors were more common in older age group which is in concordance with the study conducted by Jha R *et al.*, [14] Narang S *et al.*, [16] and Shah S *et al.*, [17]

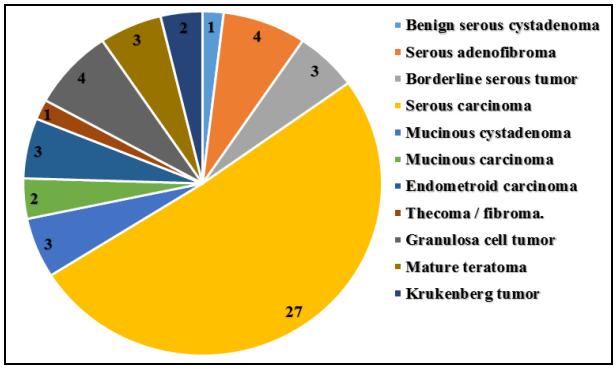

Fig 1: Distribution of Ovarian tumors

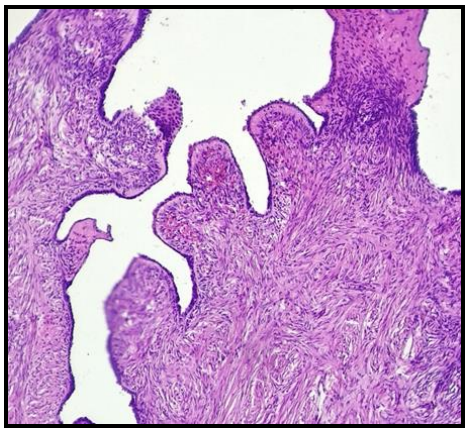

Fig 2: Serous cystadenofibroma. H&E, x4

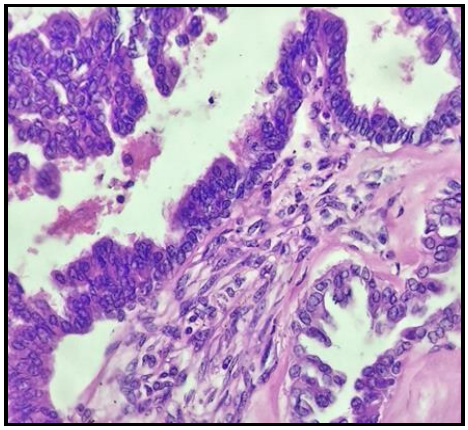

Fig 3: Borderline Serous tumor. H&E, x10

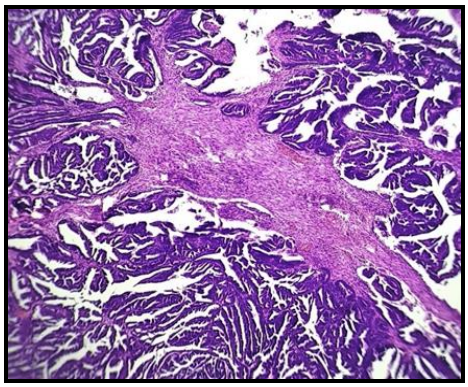

Fig 4: Serous Carcinoma, H&E, x4

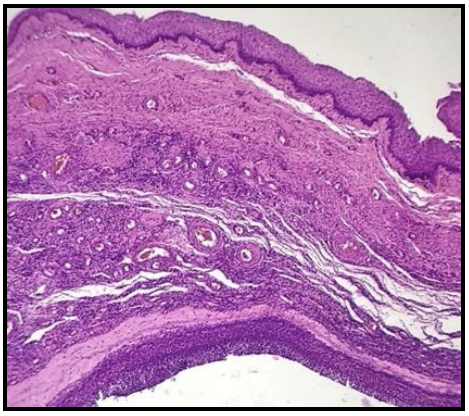

Fig 5: Mature teratomas. H&E, x4

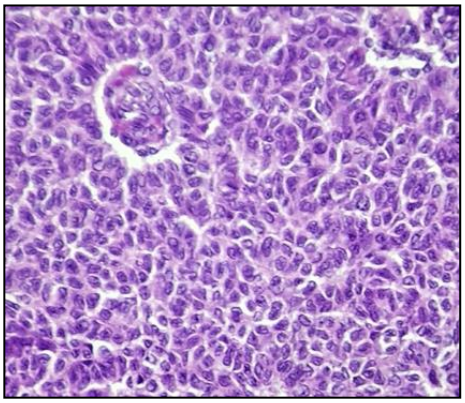

Fig 6: Granulosa cell tumor. H&E, x10

Fig 7: Cut-section of Granulosa cell tumor.

Conclusion

The ovarian tumors being one of the major gynecological challenge to medical fraternity, its accurate diagnosis can be arrived by correlating age, clinical presentation, radiological findings and morphology, which remains the gold standard. However, benign tumors are more common in the younger age group and malignant tumors in older age group. Hence early detection of ovarian tumors is very crucial in reducing the morbidity and mortality of the patients.

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