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CLINICOPATHOLOGICAL SPECTRUM OF OVARIAN TUMORS IN TERTIARY CARE CENTER

Pathology

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ABSTRACT

Introduction: Ovarian tumors are an increasing cause of morbidity and mortality worldwide. The present study was conducted in a tertiary care hospital with an objective to determine the clinicopathological spectrum of ovarian neoplasm. **Material And Methods:** It is a prospective study carried over a period of 2 years (Nov 2016 – Oct 2018). A total 109 ovarian tumors were studied. **Results:** Total 109 ovarian tumors were studied. Majority of the cases were benign tumors that is 74 cases (67.89%), 4 cases were borderline (3.67%) and 31 cases were malignant (28.44%). The most common benign tumor was serous cystadenoma and the most common malignant tumors] was serous cystadenocarcinoma. Benign tumors were seen in the third to forth decade. While malignant tumors were seen from forth decade onwards. **Conclusion:** A variety of benign and malignant tumors were reported in this study. Surface epithelial tumors were the most common category of ovarian tumors. Incidence of benign tumors was much higher than malignant tumors. Differentiation between benign and malignant tumors is important so that they can be given proper treatment.

KEYWORDS

Ovarian Tumors, Serous Cystadenoma, Surface Epithelial Tumors.

INTRODUCTION

Ovarian tumors represent about 30% of all cancers of female genital system [1]. Ovarian carcinoma represents the sixth most common female cancer and the fourth leading cause of death due to cancer in women [2]. The data from international studies shows that 80 % of the ovarian tumors are benign and seen in 20 to 45 years of age group. Ovarian tumors are generally difficult to detect until they are advanced in stage or size, as the symptoms are vague and manifest over time. Determination of various pattern of ovarian tumors is very important in diagnosis, prognosis as well as treatment of ovarian tumors. This study was undertaken with an objective to study the clinicopathological spectrum of ovarian neoplasms.

MATERIAL AND METHODS.

The study is a prospective study done in the department of pathology during the period from Nov 2016 – 0ct 2018. It included 109 cases which were received for evaluation. The specimen were fixed in 10 % formalin. Microsection of 5 micron thickness were taken and then stained with Haematoxylin and Eosin. The sections were then studied by light microscopy. The histopathological and clinical data from 109 cases was analysed. The tumors were classified according to WHO classification.

RESULTS:

Out of the 109 cases analysed, majority of the tumors 74 cases were benign (67.89%). 4 cases were borderline (03.67%) and 31 cases were malignant (28.44%).

The maximum numbers of benign tumors were found in the age group of 21-30 years while majority of the malignant cases were seen in the age group of 41- 50 years. In the present study 97 cases (88.99%) showed unilateral involvement while 12 cases (11.01%) showed bilateral involvement. Most of the tumors that had unilateral involvement were benign (94.59%) as compared to malignant cases (74.19%)

The most common symptoms with which the patients presented was abdominal pain in 67 cases (61.46%), followed by mass per abdomen in 59 cases (54.12%). Ascitis was seen in 41 cases (37.61%). While 40 cases (36.69%) had menstural irregularities or per vaginal bleeding. Urinary complaints were seen in 25 cases (22.93%).

Surface epithelial tumor was the commonest tumour reported in 74 cases (67.89%), followed by germ cell tumors in 24 cases (22.01%). 10 cases were sex cord stromal tumour (9.17%) while there was 1 case of metastatic tumor (0.91%) (Refer to table 1).

Table 1. Distribution of cases according to order of commonest frequency.

Microscopic type	Number of cases	Percentage
Surface epithelial tumors	74	67.89%
Germ cell tumors	24	22.01%
Sex cord stromal tumors	10	9.17%
Metastatic tumors	01	0.91%
Total	109	100%

Out of the 74 cases of surface epithelial tumors 49 cases were serous tumors, 22 cases were mucinous tumors followed by endometroid tumour 2 cases and 1 case of brenner tumour (Refer table 2)

Table 2. Frequency of Histological subtypes of surface epithelial tumors.

SR.NO	Tumor type	No of cases (N=74)	Percentage
1.	Serous	49	66.21%
2.	Mucinous	22	29.72%
3.	Endometroid	02	2.70%
4.	Brenner	01	1.35%
Total		74	100%

Out of 49 cases of serous tumors 29 cases (39.18%) were serous cystadenoma and 1 case of serous cystadenofibroma (1.35%). There were 19 cases of mucinous cystadenoma (25.67%) (Refer to table 3).

Table 3. Distribution of Histological subtypes of surface epithelial tumors.

Diagnosis	No of cases (N=74)	Percentage
1.Serous tumors		
a) Benign		
. Serous cystadenoma	29	39.18%
. Serous cystadenofibroma	01	1.35%
b) Borderline	03	4.05%

Diagnosis	No of cases (N=74)	Percentage
. Borderline serous Tumor c)Malignant . Serous cystadenocarcinoma	16	21.62%
2) Mucinous tumors a) Benign . Mucinous cystadenoma	19 01	25.67% 1.35%
b) Borderline . Borderline mucinous cystadenoma		
c) Malignant . Mucinous Cystadenocarcinoma	02	2.70%
3) Endometroid tumor . Endometroid Adenocarcinoma	02	2.70%
4) Brenner tumors . Malignant Brenner tumor	01	1.35%
Total	74	100%

Serous cystadenoma was the most common tumour seen in this study. Majority of these cases were unilocular and cystic . Clear to yellowish fluid was seen on cut section (Fig 1).

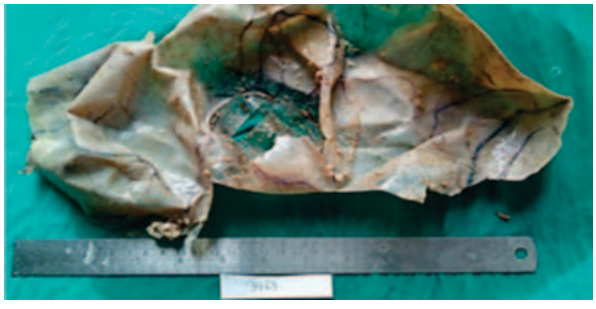

FIG 1. Gross picture of papillary serous cystadenoma

The cyst wall was lined by low columnar to flattened epithelium. Stromal invasion or nuclear atypia was not seen in any case (Fig2).

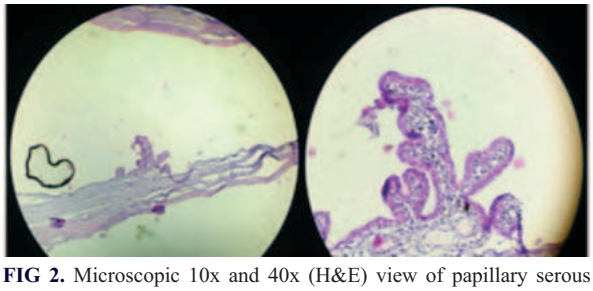

FIG 2. Microscopic 10x and 40x (H&E) view of papillary serous cystadenoma. Showing cyst wall lined by flattened to cuboidal epithelium with regular nuclei and papillary projections lined by single layer of flattened to cuboidal cell

There was only 1 case of serous cystadenofibroma microscopically showing glands and cyst lined by cuboidal to columnar epithelium, surrounded by dense fibrous stroma and lined by fibrous cyst wall.

The next most common surface epithelial tumors seen in our study were 22 cases of mucinous cystadenoma (25.67%), all were multiloculated, mostly unilateral. Cut surface showed thick mucinous material (Fig3). The cyst wall was lined by tall columnar cells with barely placed mucin (Fig4).

FIG 3. Gross picture of Mucinous cystadenoma

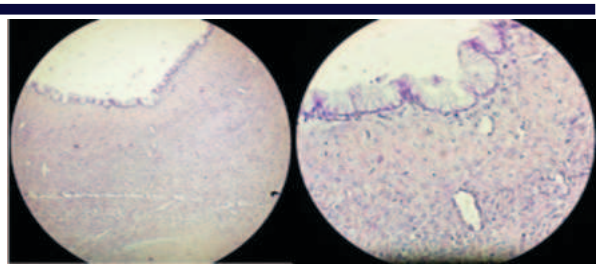

FIG 4. Microscopic (H&E) view of Mucinous cystadenoma. Showing cyst wall lined by tall columnar cell with regularly arranged basal nuclei and abundant weakly basophilic cytoplasm.

There were 3 cases of borderline serous tumours (4.05%) 1 case of borderline mucinous tumor (1.35%). All 3 cases of borderline serous tumour were unilateral. One was cystic and other two were partly solid and partly cystic. One case showed papillary encrescences. While the borderline mucinous tumour was cystic containing thick mucoid material.

The most common malignant tumor reported in our study was serous cystadenocarcinoma. Most of the cases were partly solid and partly cystic. Microscopically showed complex branching papillary projections with atypia, mitotic figures, psammoma bodies and stromal invasions (Fig5).

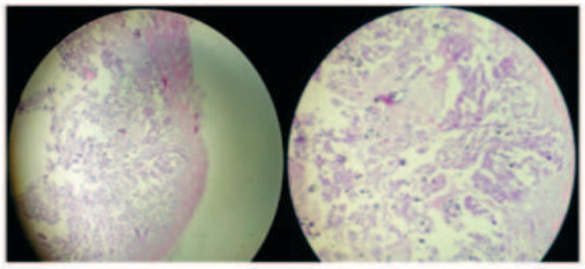

FIG 5. Microscopic 10x and 40x (H&E) view of Papillary serous cystadenocarcinoma. Showing gland like structure and papillary projections lined by large cuboidal to columnar cell having large hyperchromatic pleomorphic nuclei with scanty cytoplasm and mitotic figures with plenty of psammoma bodies

Mucinous cystadenocarcinoma showed complex gland like structures with nuclear atypia. There were 2 cases of endometroid adenocarcinoma. Both of them were unilateral. They were partly solid and partly cystic with areas of hemorrhage and necrosis. There was only one case of malignant brenner tumor seen in a 55 year old female. The tumour was unilateral and solid. Microscopically showed long papillary fronds lined by transitional epithelium having atypical nuclei and distinct nucleoli (Fig6).

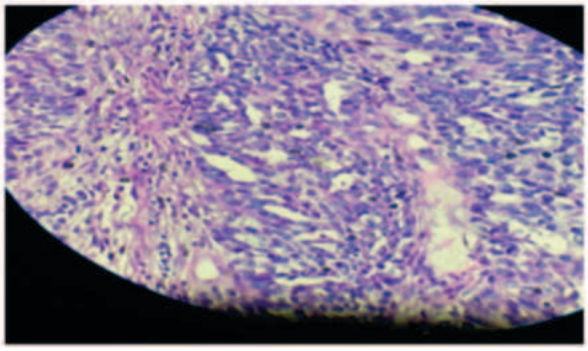

FIG 6. Microscopic 40x (H&E) view of Malignant brenner tumor. Showing long papillary fronds lined by transitional epithelium. Tumor cell having small oval atypical nuclei with distinct nucleoli

Our study comprised of 24 cases of germ cell tumours (Refer to table 4), out of which mature teratoma was the most common comprising of 16 cases (66.66%) followed by dysgerminoma 4 cases (16.66%). There was also 1 case each of immature teratoma, struma ovari, embryonal carcinoma and malignant mixed germ cell tumor.

Table 4. Frequency of Germ cell tumor.

Germ cell tumor	No of cases (N= 24)	Percentage
a)Dysgerminoma	04	16.66%
b) Teratoma 1) Mature teratoma 2)Immature teratoma 3) Struma ovarii	 16 01 01	 66.66% 4.16% 4.16%
c)Embryonal carcinoma	01	4.16%
d) Malignant mixed germ cell tumor	01	4.16%
Total	24	100%

Mature teratomas on gross showed unilocular cyst filled with pultaceous material containing tuft of hair, teeth with bony hard areas. while 1 case was of strauma ovarii which on microscopically showed ovarian stroma with thyroid follicles lined by cuboidal epithelial cells.

One case of embryonal carcinoma was seen in a 65 years old female. Microscopically showed sheets and nests of large primitive cells, occasional papillae and abortive glands lined by round cells having hyperchromatic nuclei and scanty cytoplasm, along with areas of hemorhage and necrosis.

Our study was comprised of 10 cases of sex cord stromal tumours (Refer to table 5). There were 4 cases of fibroma thecoma. All of these cases were unilateral. Microscopically showed interlacing fascicles of large spindle cells with spindle nuclei. At places loosely arranged fascicles of plump cells were also seen. We also came across 4 cases of granulosa cell tumor, out of which 3 were adult granulosa cell tumor and 1 case was juvenile granulosa cell tumor. The juvenile granulosa cell tumour was seen in a13 year old girl. On gross the tumour was cystic and multiloculated. While the 3 cases of adult granulosa cell tumor were seen in 4th to 5th decade. The tumor were partly solid and partly cystic. Microscopically showed tumor tissue comprised of sheets, groups and trabeculae of round to oval cells having large round to oval nuclei containing clefts, Call -Exner bodies were also seen. (Fig7)

Table5. Frequency of sex cord stromal tumors.

Sex cord stromal tumors	No. of cases (N=10)	Percentage
a) Granulosa cell tumor	03	30%
b) Juvenile granulosa cell tumor	01	10%
c) Fibrothecoma	04	40%
d) Sclerosing stromal tumor	02	20%
Total	10	100%

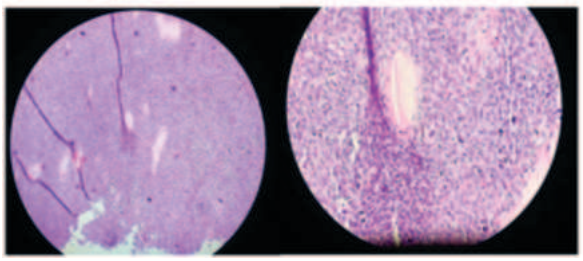

FIG 7. Microscopic 10x and 40x view (H&E) of granulosa cell tumor showing sheets groups of round to oval cells having large round to oval nuclei, showing cleft (coffee bean nuclei) callexner bodies seen.

We also found 1 case of metastatic tumor in a 36 year old female who was already a diagnosed and operated case of breast carcinoma. she presented with metastatic deposits in bilateral ovaries.

DISCUSSION:

Ovarian lesions are unusual due to their diverse morphology. Ovarian neoplasm has become increasingly important not only because of its large variety of histomorphological patterns but more because they have gradually increased the mortality rate in female genital cancers due to the vague symptoms and are diagnosed at an advanced stage. The clinical appearance and behavior of different type of ovarian tumors is extremely variable. It is generally impossible to diagnose the nature of ovarian tumor just by clinical or gross examination. Hence one has to depend on the microscopic examination of the tumor for accurate typing[3].

Total 109 cases were analysed. The ovarian tumors are diagnosed as benign, borderline or malignant depending upon the presence of predominant cell type, pattern of growth, amount of fibrous stroma and cellular atypia with invasiveness. In this study out of 109 ovarian tumors, 67.89% were benign (N=74) ,28.44% (N=31) were malignant and 3.67%(N=4) were borderline tumors. These were similar to the studies done by Patel et al [3], Pelli et al [4], Nishal et al [5],S.Shaikh et al [6], Agrawal et al [7]and Manoja et al [9] , which showed that the incidence of benign tumors is more than the malignant tumors. Unilateral involvement was more common and there tumors were mostly benign, then the bilateral involvement which were malignant. These findings were similar to R Jha et al [9]and Kar et al [10] .

In the present study the benign tumors were seen mostly in 21-30 years of age group while majority of the maliganant cases were seen in 41-50 years of age group. These findings were in concordance with Santosh kumar et al [11] and Bhagyalaxmi et al [12]. The clinical presentation of ovarian tumors remain variable. The most common clinical presentation in majority of the patients was abdominal pain (61.46%) followed by mass per abdomen (54.12%), ascites (37.61%) , menstrual irregularities (36.69%) and urinary complaints in (22.93%) cases . Findings similar to this study were reported by Agrawal et al [7]and A. Patel [3], where the commonest presenting symptoms were pain in abdomen followed by mass in abdomen . While mass per abdomen was more common than abdominal pain in the study done by Manoja et al and Maheshwari et al [13].

WHO classification of ovarian tumors is based on the tissue of origin of tumors which have been found to arise from one of the three ovarian components 1) epithelium 2) Germ cell 3) Stroma of the ovary.

In the present study most of the cases were benign (67.89%) followed by malignant (28.44%) and borderline (3.67%). Similar pattern was reported by Bhagyalaxmi et al [12]in 2014 where they observed 78.3% as benign, 18% malignant and 3.7% as borderline tumors.

In the present study surface epithelial tumors were 67.89%, germ cell tumors were 22.01% and sex cord stromal tumors were 9.17%. Similar results were seen in the studies of Bodal etal [14] , Willis etal [15]and Nehal et al [16] .

The majority of the epithelial tumors were serous tumors 66.21% followed by mucinous tumors (29.72%). Similar results were obtained in the studies done by Ahmed et al [17]and Modepalli et al [18].

Serous cystadenocarcinoma was the most common malignant surface epithelial tumor (21.62%) which was in concordance with the result of Ahmed et al [17], Purti Agrawal et al [7] and Nishal et al [5].The incidence was high in the study done by Pilli et al [4] and low in the studies done by Manoja et al [8]and Patel et al [3].

Germ cell tumors in this study were 22.01% in which benign cystic teratoma comprised of the maximum number of cases 16(66.66%). Similar results were observed by Ahmed et al (76.72%) [17]and Sharma et al (87.09%) [19]resepectively. While a low incidence was noted by Manoja et al (9.2%) [8]and Patel et al (16%) [3].

Malignant counterpart dysgerminoma comprised of maximum number of cases 16.66%. The incidence of dysgerminoma was low in the studies done by Purti Agrawal et al (1.32%) [7], Manoja et al (2.3%)[8] and Patel et al (1.3%) [3].

In the present study sex cord stromal tumors were 9.17%. The maximum number of cases were granulosa cell tumor accounting for 30 % of the cases. Similar results were seen in the studies done by Jha et al [20], Bhagyalaxmi et al[12] and Willis et al [15].

Metastatic ovarian tumor was 0.92% and the findings of the present study were in accordance with the studies of Purti Agrawal[7] and Manoja et al [8] where the incidence of metastatic tumor was 0.9% and 0.8% respectively.

CONCLUSIONS:

Surface epithelial tumors was the most common ovarian tumors followed by germ cell tumors, sex cord stromal tumors and metastatic tumors in the decreasing order of frequency. Incidence of benign tumors was much higher than the malignant tumors with benign serous cystadenoma being the most common benign tumor and serous cystadenocarcinoma being the most common malignant tumor.

Reproductive age group showed higher incidence of ovarian tumors where as there was increasing incidence of malignancy with increasing age group. Pain in abdomen was the most common symptom. Benign tumors showed cystic morphology and were unilateral while malignant tumors were partly solid and cystic and they also were mostly unilateral. Ovarian malignancies are associated with high degree of mortality and morbidity. Histopathological diagnosis is very important to differentiate a benign tumor from malignant one to assure proper and prompt management to the patients so that they can have a speedy recovery.

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