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Distribution & Histopathological Study of Various Types of Ovarian Tumors: An Institutional Study

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ABSTRACT

Background & Objectives: Ovarian tumors are one of the most common tumors, which occur in female genital tract. Despite the newer techniques in imaging and molecular biology, the diagnosis of ovarian tumors primarily depends on histopathological examination. This study describes the distribution, clinical and histopathological details of various ovarian tumors in a tertiary care center in Maharashtra, and to find out the incidence of benign and malignant ovarian tumors.

Materials and methods: This study includes all the ovarian tumors sent to the Department of Pathology at MGM Medical College, Aurangabad. A prospective study of 2 years as well as retrospective study of 2years was done. The correlation of these tumors was done with age, clinical presentation and histomorphological patterns. The data from retrospective study and prospective study was compared.

Results: A total number of 112 cases were studied. Out of these 86 were benign and 26 were malignant. Maximum cases were seen in 21 to 30 years. The maximum number of benign tumors belonged to surface epithelial type, of these serous cysadenoma (38 cases) were common followed by mucinous cystadenoma(16 cases). Second largest group was formed by mature teratoma(28 cases). 2 cases each of fibrothecoma and lipid cell tumor were noted. Malignant tumors like serous cystadenocarcinoma formed 8 cases out of which 2 cases showed metastasis to rare sites like cervix and appendix and 2 cases coexisted with stromal sarcoma of the uterus, granulosa cell tumor formed 10 cases and 4 cases each of dysgerminoma and endodermal sinus tumor were noted.

Conclusion: In the study majority (77%) of ovarian tumors were benign. Malignancy was seen in 23% of the cases. Correct histopathological diagnosis of ovarian tumors is of prime importance in view of their behavioral predictability and clinical correlation for proper management of the patient.

Keywords: Ovarian tumors, Serous cysadenoma, Teratoma, Serous cystadenocarcinoma, Gynecologic malignancy.

INTRODUCTION

The ovaries are paired pelvic organs located on both the sides of the uterus close to the lateral pelvic wall. Tumors of the ovary are common forms of neoplasm in women. Ovarian malignancies account for 6.6% of all malignant tumors of the female genital tract. Among the cancers of the female genital tract, the incidence of ovarian cancer ranks below carcinoma of the cervix and the endometrium. Many of these ovarian neoplasms cannot be detected early in their development and they account for almost half of the deaths from cancer of the female genital tract.[1]

Main function of the ovary is secretion of steroid hormones like estrogen and progesterone and development and release of the ovum[1]. It contains sex cells which are pluripotent and mesenchymal and hence when a neoplasm arise almost any type of tumor can occur.[2]

Ovarian neoplasms remain asymptomatic until massive ovarian enlargement causes compression of the pelvic structures, ascites, abdominal distension or distant metastasis. Ovaries not

only give rise to a wide variety of malignancies but are also a site for metastasis from many other organs. The complex anatomy of ovary, its peculiar physiology with the constant cyclical changes from puberty to menopause give rise to a number of cell types each of which is capable of giving rise to tumors.[2,3]

Surface epithelial ovarian tumors constitute majority of all the ovarian tumors. They exist in different histological patterns and exhibit varying degree of aggressiveness. Among them most are serous, followed by mucinous, endometrioid and others. Germ cell tumors are the commonest ovarian neoplasms in young age group and constitute two thirds of ovarian tumors out of which one third are malignant.[4,5,6]

There are numerous types of ovarian tumors, both benign and malignant. About 80% are benign, and these occur mostly in young women between the age of 20 to 45 years. The malignant tumors are more common in older women between the age of 40 to 65 years.[1]

The study was being undertaken to study in detail the different varieties of ovarian tumors in MGM Hospital & Medical College, Aurangabad and assess their characteristics with regard to incidence, age and histopathological appearances.

MATERIALS AND METHODS

The materials used for the present study were ovarian tumor specimens received at the Department of pathology. This was a prospective study from May 2017 to May 2019 and the incidence was compared with the retrospective study from May 2015 to April 2017.

H & E stained histopathology slides were studied in detail. All details of the case consisting of clinical history, external examination, gross features, microscopic features and final diagnosis were filled in a proforma. Details from all proforma were tabulated.

OBSERVATION AND RESULTS

A total of 112 cases of ovarian tumors were collected. Out of these 86 were benign and 26 were malignant. Hysterectomy specimens with ovarian tumors and all the ovarian tumor specimens were included. Non neoplastic ovarian lesions like simple ovarian cyst and tubo ovarian mass were excluded.

Table – 1 : Incidence of nature of the ovarian tumors

Sr. No	Type	No. Of cases	Percentage
1	Benign	86	77
2	Malignant	26	23
3	Total	112	100

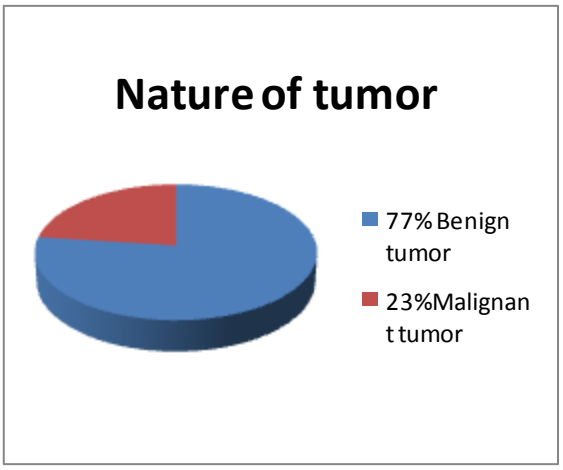

Fig.1 pie chart showing percentage incidence of nature of ovarian tumors

Table – 2 : Incidence of various histopathological types of ovarian tumors

Sr. No	Types of tumors	Benign	Malignant	total	Percentage
1	SET	54	8	62	55
2	GCT	28	8	36	32
3	SST	04	10	14	13
4	Total	86	26	112	100
5	percentage	77	23	100	

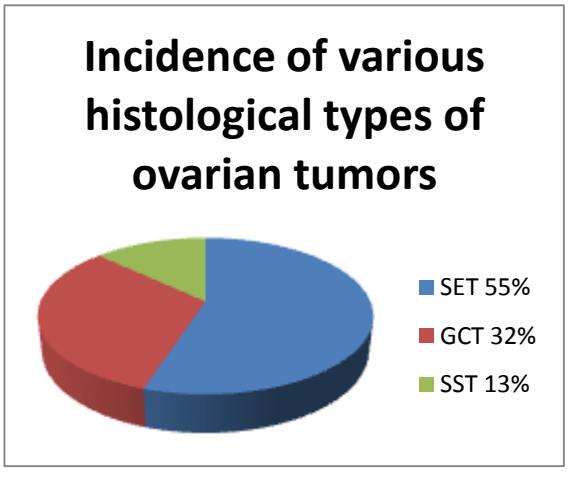

Fig. 2- Pie chart displaying percentage incidence of various histological types of ovarian tumors

Adopting the WHO classification it was found that the number of surface epithelial tumors were maximum, accounting to 62 cases (55%) followed by germ cell tumors 36 cases (32%) and 14 cases (13%) were of sex cord stromal tumors (table 2; fig 2) in the study.

Table – 3 : Incidence of various subtypes of ovarian tumors

Group	Types of Tumor	No.of cases	Percentage
Surface Epithelial Total- 62 (55%) Benign- 54 Malignant-8	Serous tumor(total)	46	41
	Benign	38	34
	Malignant	8	07
	Mucinous tumor(total)	16	14
	Benign	16	14
	Malignant		-
Sex cord stromal tumor Total-14(13%) Benign- 4	 Lipid cell tumor Fibrothecoma	 02 02	 02 02
Malignant-10	Granulosa cell tumor	10	09
Germ cell tumors Total-36(32%)			
Benign-28	Mature Teratoma	28	24
Malignant -8	Dysgerminoma Endodermal sinus tumor	04 04	4 4
Total		112	100

The frequency of occurrence of various sub-types of tumors found in the study is shown above. Amongst all types, the surface epithelial tumors formed largest group with 55%, serous tumors formed 41%, followed by mucinous tumors which accounted to 14%. Germ cell tumors constituted of 32% & sex cord stromal tumors constituted of 13% of all the ovarian tumors found in the study.

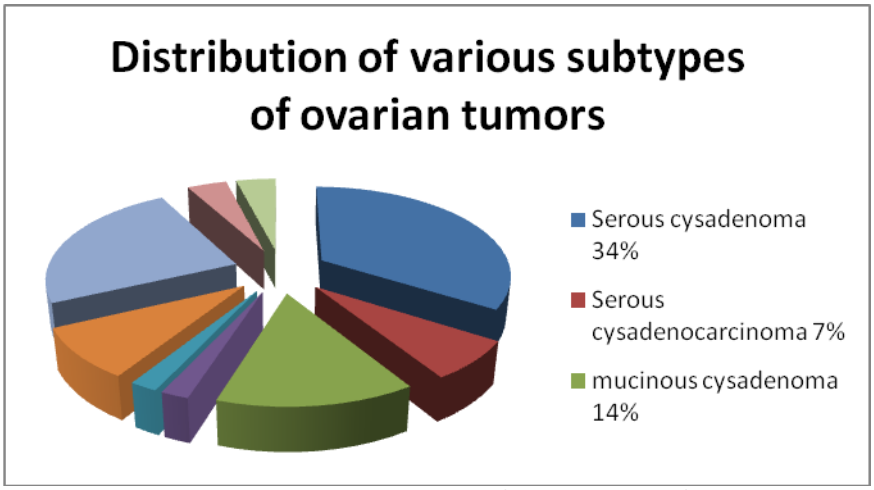

Fig 3 - Pie chart showing percentage distribution of various subtypes of ovarian tumors

Serous cystadenoma was the commonest tumor of all the ovarian tumors comprising of 34% followed by mature teratoma 24%, mucinous cystadenoma comprised of 14%, granulosa cell tumor 9%, serous cystadenocarcinoma 7%, 4% cases of dysgerminoma and endodermal sinus tumor each and 2% cases of fibrothecoma and lipid cell tumor each.

The occurrence of ovarian tumors was found maximum in the 3rd decade with increased incidence of germ cell tumors followed by surface epithelial tumors. Overall the incidence of mature teratoma was found to be maximum followed by serous cystadenoma in the 3rd decade. The youngest patients in the study were two patients of 20 year old each, one was diagnosed as mature teratoma and another was diagnosed as dysgerminoma.

Table – 4 : Incidence of age distribution of ovarian tumors in each broad type

Age in years	Total No	%	SET Ben	SET Mal	GCT Ben	GCT Mal	SST Ben	SST Mal
0-10	-	-	-	-	-	-	-	-
11-20	04	03	-	-	02	02	-	-
21-30	44	39	16	-	18	06	-	04
31-40	20	18	14	-	-	-	02	04
41-50	20	18	12	02	04	-	02	-
51-60	10	09	04	02	04	-	-	-
>61	14	13	08	04	-	-	-	02
Total	112	100	54	08	28	08	04	10

Of all the ovarian tumors unilateral presentation was seen in 89% cases, whereas 11% cases showed bilateral presentation. Unilaterality was seen in 77% of the malignant ovarian tumors and bilaterality was seen in 23% of the malignant ovarian tumors. Serous cystadenocarcinoma comprised of 4 cases out of which 2 cases showed unilateral presentation and 2 cases showed bilateral presentation. Granulosa cell tumor comprised of 5 cases, all were unilateral. 2 cases of endodermal sinus tumor were noted both showed unilateral presentation. Out of 2 cases 1 case of dysgerminoma showed unilateral presentation and other showed bilateral presentation.

The study revealed that, 46% of the total tumors studied were cystic, 38% were partly solid and partly cystic and 16% were solid in consistency.

The size analysis show that maximum number of cases 50 cases (45%) of all the ovarian tumors were in 11 to 20 cm category followed by 1-10 cm category 40 cases (35%), 20 cases (18%) in 21-30cm category and 2 case (2%) in 31-40cm category. Largest tumor was mucinous cystadenoma of 32 x 31 x 18 cm in size.

Table – 5 : Mode of presentation of ovarian tumors

Sr No	Clinical presentation	No of cases	%
1	Mass per abdomen	40	36
2	Abdominal pain	14	12
3	Menstrual irregularities	-	-
4	Ascites	04	03
5	Urinary Complaints	-	-
6	Mass per abdomen+ abdominal pain	30	27
7	Ascites + menstrual irregularities + hirsuitism	02	02
8	Abdominal pain+ mass per abdomen+ ascites	08	07
9	Ascites+urinary complaints+mass per abdomen	02	02
10	Mass per abdomen+ menstrual irregularities	02	02
11	Abdominal mass+ ascites	02	02
12	Abdominal pain+ ascites	02	02
13	Abdominal pain+ urinary complaints+ ascites	04	03
14	Abdominal pain+ menstrual irregularities	02	02
	Total	112	100

The frequency of mode of presentation of ovarian tumors found in the study is shown above. Mass per abdomen 40 cases (36%) was the commonest mode of presentation followed by combination of mass and pain in abdomen 30 cases (27%).

The incidence of prospective study was compared with retrospective study. In retrospective study 46 cases of ovarian tumors were found. Out of 46 cases, 39 were benign and 7 cases were malignant & prospective study 66 cases out of which 53 cases were benign and 13 were malignant.

Incidence of total number of ovarian tumors is increased in prospective study when compared with the retrospective study.

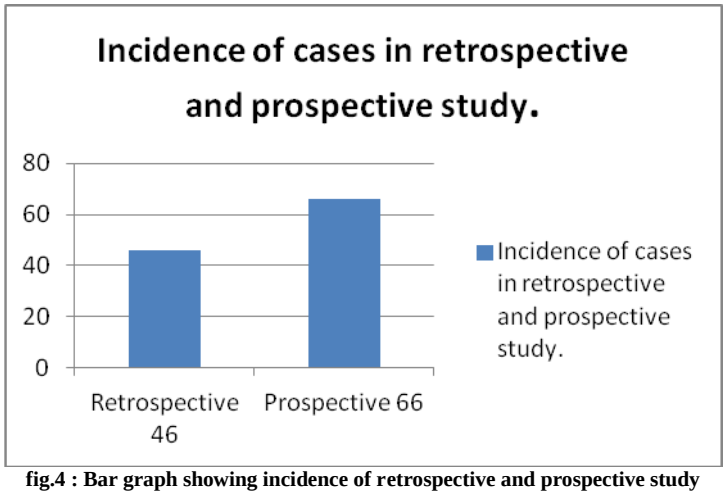

fig.4 : Bar graph showing incidence of retrospective and prospective study

Fig 5: Serous cysadenocarcinoma. Cut section shows solid and cystic areas

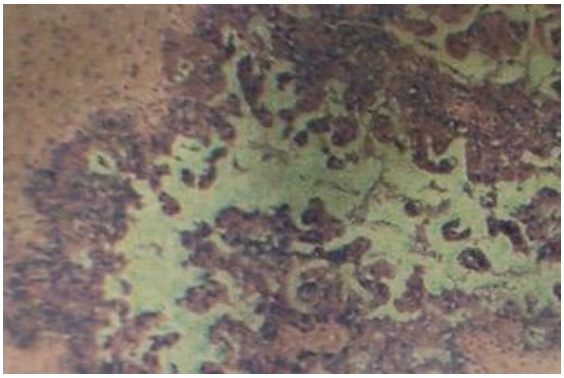

Fig6: Serous cystadenocarcinoma. Microscopy shows papillae lined by tumor cells(H & E ,40x)

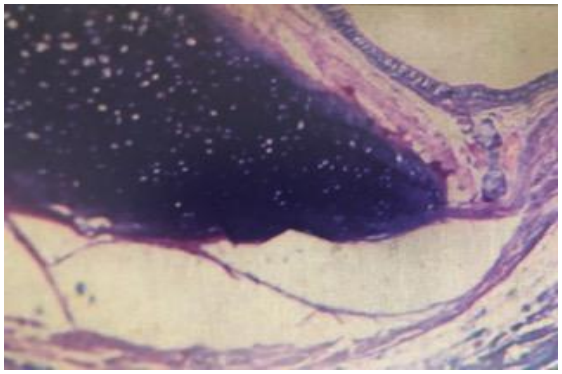

Fig.7 : Mature teratoma. Photomicrograph showing cartilage and peudostratified ciliated respiratory epithelium H & E,100x

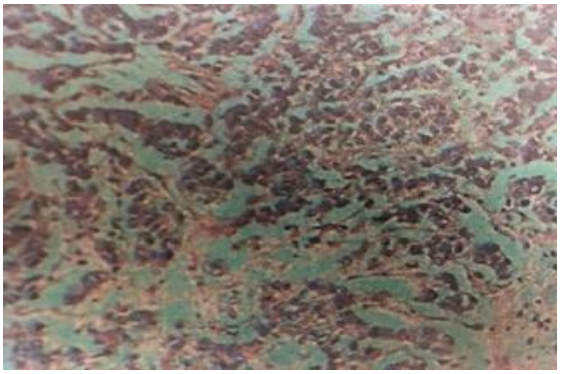

Fig. 8 : Dysgerminoma. Photomicrograph shows cells dispersed in cords separated by scant fibrous stroma.H & E,100x

Fig.9 : Endodermal sinus tumor. Cut surface shows grey white solid areas.

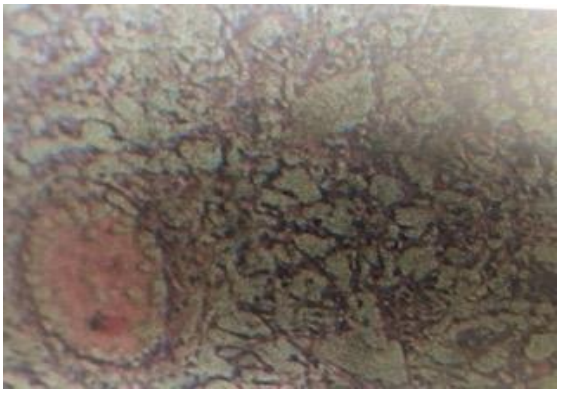

Fig.10 : Endodermal sinus tumor. Photomicrograph shows Schiller –Duval body. H & E,100x

Fig.11 : Lipid cell tumor. Cut surface showing yellowish areas.

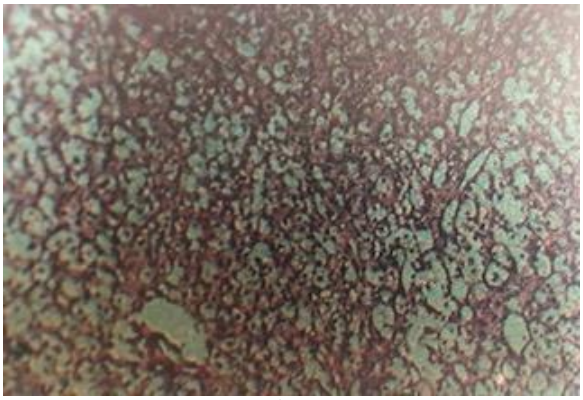

Fig.12 : Lipid cell tumor of ovary. Photomicrograph shows tumor consisting of sheets of large round to polyhedral cells with clear or acidophilic cytoplasm and monotonous centrally placed nuclei. H & E,400x

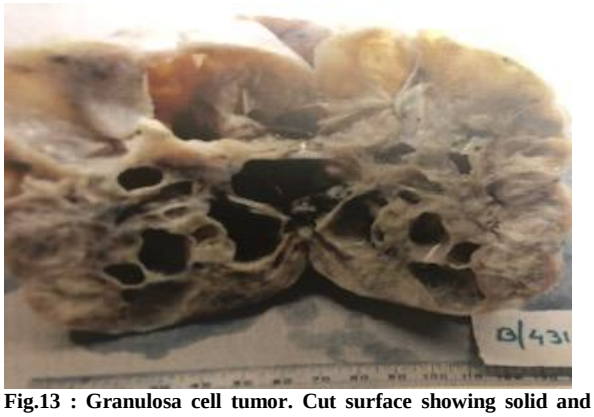

Fig.13 : Granulosa cell tumor. Cut surface showing solid and cystic areas

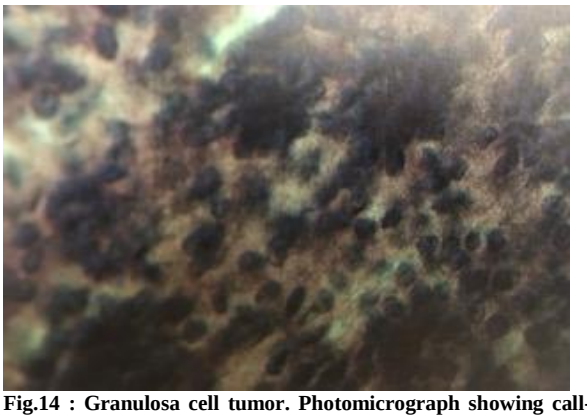

Fig.14 : Granulosa cell tumor. Photomicrograph showing call-exner bodies H & E,400x.

DISCUSSION

Out of 112 cases 86 cases (77%) were benign and 26 cases (23%) were malignant. This was similar to findings of Ramachandran et al[7] and Mondal et al[30] which showed predominance of benign tumors followed by malignant tumors and no incidence of borderline tumors.

Histologically total 112 cases who presented as ovarian tumors were studied. The tumors were classified according to the WHO classification. Surface epithelial tumors were the commonest variety constituting 55% of all the ovarian tumors, which was also seen in the above studies, followed by germ cell tumors 32%, and sex cord stromal tumors 13%. Our findings matched with the above studies which showed surface epithelial tumors as the commonest variety followed by germ cell tumors & sex cord stromal tumors, however no case of metastasis was found in the study.

In our study out of total 112 cases, 52 cases (46%) were cystic, 18 cases (16%) were solid and 42 cases (38%) had both solid and cystic areas. All the cystic lesions were benign. Our findings were similar to the findings of Kar et al[26]. In our study, out of total 112 cases, 100 cases were unilateral and 12 cases were bilateral. Most of the benign tumors were unilateral and bilateral involvement was seen predominantly in malignant cases. Comparative analysis was done which showed our study did not correlate with Kar et al, which showed higher percentage of bilateral tumors.

In our study the tumors ranged in size from 5 to 32 cm. The smallest tumor had a size of 5 x 4 x 2 cm that was detected in a 33 year old female diagnosed as lipid cell tumor of ovary. The largest tumor measured was 32 x 31 x 18 cm in a 28 year old female diagnosed as Mucinous cystadenoma of the ovary. This finding

showed correlation with Pilli et al[23] study which showed similar findings.

The tumors of the ovary can occur at any age even in children and old age. In this study maximum numbers of cases were between 21-30 yrs of age group. The youngest case in the present study were 2 cases of 20 year old, one was diagnosed as mature teratoma and other was diagnosed as dysgerminoma and the oldest case was a 75 year old diagnosed as serous cystadenocarcinoma. Comparative analysis of age incidence is done with various other studies Pilli et al [23], Kar et al[26] which showed maximum age group percentage in 3rd to 4th decade of life which is in concordance with Pilli et al.

In our study almost half of the cases presented with combination of abdominal pain, mass per abdomen, ascites, and menstrual irregularities. Comparative analysis of the symptoms was done with Pilli et al[23] study. The most common symptom in the study was mass per abdomen, whereas in Pilli et al[23] study abdominal pain was reported as the most common symptom.

One case of granulosa cell tumor showed signs of hirsuitism who presented with menstrual irregularities.

Among the individual tumors serous tumors were commonest (34%), followed by mature teratoma (24%), mucinous tumors (14%), granulosa cell tumor (9%), serous cystadenocarcinoma (7%), dysgerminoma and endodermal sinus tumor (4% each) and lipid cell tumor and fibrothecoma (2% each) were found. Two rare case of serous cystadenocarcinoma coexisting with stromal sarcoma of the uterus was noted. IHC showed tumor positivity for vimentin and CD-10 and cytokeratin was focally positive. Dragoumis et al studied 137 cases of synchronous primary neoplasms of the uterine corpus and the ovary, 95 out of which 5 cases showed coexistence of primary endometrial adenocarcinoma with primary ovarian tumors. They concluded that coexistence of distinct primary neoplasia in the uterus and ovaries is rare & diagnosis of primary malignancies in the uterus and ovaries should be based on histological examination. Young RH, Scully RE16 reported 21 cases of sarcomas with metastasis to the ovary and found that eleven tumors were primary tumors in the uterus and 10 were outside the genital tract.

The retrospective study showed 46 cases of ovarian tumors where as prospective study showed 66 cases with increase in incidence of ovarian tumors in MGM hospital, Aurangabad.

39 benign cases were found in retrospective study where as prospective study showed 53 benign cases, 7 malignant cases were found in retrospective study, prospective study showed increase in number of malignant cases with 13 cases of malignant ovarian tumors. Surface epithelial tumors, sex cord stromal tumors and germ cell tumors showed slightly increased incidence in prospective study than retrospective study. The incidence of granulosa cell tumor was found to be increased in prospective study. Two rare cases of lipid cell tumor of ovary were noted in the prospective study whereas two cases of thecoma were reported in the retrospective study.

CONCLUSION

Total 112 cases were studied. Out of which benign tumors were the most common (77%), followed by malignant tumors 23%. No borderline tumors or mixed tumors were found. Serous cystadenoma (34%) was the most common benign tumor, while granulosa cell tumor (9%) was the most common malignant tumor. The tumors were classified according to WHO classification. Surface epithelial tumors were the commonest variety constituting 55% of all the ovarian tumors followed by germ cell tumors 32% and sex cord stromal tumors 13%. Surface epithelial tumors 55% were the commonest of all the ovarian neoplasms. Serous cystadenoma accounted for 34% of all the cases, followed by mucinous cystadenoma (14%). Malignant cases comprised of serous

cystadenocarcinoma accounted for 7%. Two cases of serous cystadenocarcinoma showed metastasis to rare sites like cervix and appendix. Another case of serous cystadenocarcinoma showed coexistence with stromal sarcoma of the uterus. Out of sex cord stromal tumors granulosa cell tumor (9%), fibrothecoma (2%) and lipid cell tumor of the ovary (2%) were the cases found. One interesting case of granulosa cell tumor showed hirsutism which was confirmed by IHC due to unusual clinical findings, thus signifying the importance of IHC. Out of Germ cell tumors mature teratoma (24%), dysgerminoma (4%) and endodermal sinus tumor (4%) were the cases found in the study.

The most common symptom was mass per abdomen followed by combination of mass & pain in abdomen. The size of smallest tumor was 5 x 4 x 2.5 cm & the size of largest tumor was 32 x 31 x 18 cm. Most of the benign tumors were unilateral. Bilateral involvement was seen mostly in malignant cases. One case of bilateral dysgerminoma was also reported. Maximum numbers of cases were in 21 to 40 yrs of age group. The incidence of ovarian tumors appeared to be increased in prospective study when compared with retrospective study, malignant cases were also found to be increased in prospective study (13 cases) when compared with retrospective study (7 cases) in MGM hospital, Aurangabad. The study revealed that benign tumors are more common than malignant ovarian tumors. Surface epithelial tumors were the most common of all the ovarian tumors, affecting mainly the reproductive age group & clinical features were usually late manifestations. The Histopathological study of different ovarian tumors is necessary to know the course of the disease. Ancillary techniques like immunohistochemical stains are required at times to confirm the histopathological diagnosis.

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