A Clinico-Pathological Study of 120 Cases of Ovarian Tumors in a Tertiary Care Hospital

Chandekar Sushama A[1], Deshpande Shubha A[2], Muley Prabha S[3]

ABSTRACT

Introduction: Ovarian tumors present with a wide spectrum of clinical, morphological and histological features. Clinically, they may be misdiagnosed with other non-neoplastic conditions. Early diagnosis is difficult due to its asymptomatic nature, inaccessible site and the limited use of simple methods of diagnosis like cytology. Aim: This study was undertaken with the aim of to study the different histopathological types of ovarian tumors, to analyze the clinical data of the patient in regarding ovarian tumors and to establish the correlation between the clinical signs, symptoms and histological findings.
Material and Methods: A prospective study was carried out over a period of 2 years in a tertiary care hospital in order to evaluate the clinico-pathological features of 120 cases of ovarian tumors and their correlation. These tumors were classified as per World Health Organization (WHO) classification of ovarian tumors depending on their most probable cell of origin and histomorphological features.
Results: Out of 120 cases of ovarian tumors, 92 cases (76.67%) were benign, 3 cases (2.50%) were borderline and 25 cases (20.83%) were malignant. Surface epithelial - stromal tumors 84 cases (70%) were common followed by Germ cell tumors 27 cases (22.50%), Sex cord – stromal tumors 7 cases (5.83%) and Metastatic tumors in ovary 2 cases (1.67%).
Conclusion: Ovarian cancer is a leading cause of death among gynecologic malignancies in female. We know that application of current knowledge and technique would revolutionize the ovarian cancer statistics. This will help large number of women in each year and lead towards the more satisfactory therapy of disease.

Keywords: Ovarian Tumors, Clinico-Pathological Correlation, Ovary, World Health Organization classification.

INTRODUCTION

Ovarian cancer constitutes sixth most common cancer among women worldwide and the seventh leading cause of cancer deaths.[1] Ovary is the most important organ as it is concerned with progeny. It can give rise to complex variety of tumors, varying in structure, function and histogenesis. It is well established that neoplastic conditions of ovaries form a complicating and baffling subject in the history of oncology. The complex anatomy of ovary and its peculiar physiology with constant cyclical changes from puberty to menopause gives rise to a number of cells with various differentiations. Each of which is capable of giving rise to tumors. Hence ovarian tumors have been rightly termed as spectrum of diseases rather than single entity. Ovarian cancer is a leading cause of death among gynecologic malignancies. Among cancers of the female genital tract, the incidence of ovarian cancer ranks after carcinoma of the cervix and the endometrium. The complex nature, unpredictable behavior and prognosis make the ovarian neoplasm a difficult problem to the Pathologist and the Gynecologist. Also the insidious onset of the disease makes it very difficult for the patient to recognize the condition. Hence when the patient reports to the doctor with symptoms the disease has already been spread and metastasized in different sites in many of the cases. Hence ovarian carcinoma often is called the 'silent killer' because symptoms do not develop until advanced stages when chances of cure are poor. One of the reasons for this is the site of tumor which renders it inaccessible to simple methods of diagnosis such as smears, biopsy and curettage. The aims and objectives of this study are to study the different histopathological types of ovarian tumors, to analyze the clinical data of the patient in regarding ovarian tumors and to establish the correlation between the clinical signs, symptoms and histological findings.

MATERIAL AND METHODS

A clinico-pathological study of 120 cases of ovarian tumors was carried out over a period of 2 years in the Department of Pathology, Government Medical College, Nanded. This was a prospective study. Specimens were received in the form of biopsies or tumor masses resected from operation from the Department of Obstetrics and Gynecology. The clinical data of all patients were analyzed to gain as much information as possible and also from the record section of the institute. Specimens received were studied thoroughly to note the gross findings. The examination of surgical specimens resected from patients with ovarian tumors was done as per the protocol of the Cancer Committee of the College of American Pathologists. All different sections taken from mass and other tissues were put in 10% formalin.

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The tissues after complete processing were embedded in paraffin, blocks prepared and cut into sections of 5 micron thickness. The sections then stained by routine Hematoxylin and Eosin (H&E) stain and special staining techniques like Periodic Acid Schiff (PAS) and Reticulin stains were used whenever necessary. These tumors were classified as per World Health Organization (WHO) classification of ovarian tumors depending on their most probable cell of origin and histomorphological features. The staging was done based on the International Federation of Obstetrics and Gynecology.

RESULTS

There were 120 cases of ovarian tumors encountered over the 2 year period. Out of 120 cases of ovarian tumors, 92 cases (76.67%) were benign, 3 cases (2.50%) were borderline and 25 cases (20.83%) were malignant. Different histological types of benign, borderline and malignant ovarian tumors were shown in table no.1. Surface epithelial - stromal tumors 84 cases (70%) were seen followed by Germ cell tumors 27 cases(22.50%), Sex cord – stromal tumors 7 cases(5.83%) and Metastatic tumors in ovary 2 cases (1.67%). Among the individual tumors, Serous tumors 66 cases were common followed by Dermoid cyst 20 cases (Figure 1b), Mucinous tumors 17 cases, Dysgerminoma 3 cases (Figure 1a), Fibroma 2 cases (Figure 2a), Struma ovarii 2 cases (Figure 1c), Metastatic tumors in ovary in 2 cases including 1 case of Krukenberg tumor (Figure 2d) and 1 case of each of Granulosa cell tumor (Figure 2b), Granulosa – Theca cell tumor, Thecoma – Fibroma, Sertoli - Leydig cell tumor (Figure 2c), Sclerosing stromal tumor, Dermoid cyst with Squamous cell carcinoma (Figure 1d), Struma ovarii with Follicular carcinoma of thyroid and Undifferentiated carcinoma. The commonest benign tumor observed was Serous cystadenoma in 55 cases (45.83%) followed by Dermoid cyst in 20 cases (16.67%), Mucinous cystadenoma in 11 cases (9.17%). The commonest malignant tumor observed was Serous adenocarcinoma in 10 cases (8.34%) followed by Mucinous adenocarcinoma in 4 cases (3.33%), Dysgerminoma in 3 cases (2.50%) and Metastatic tumors in ovary in 2 cases (1.67%). The commonest borderline tumor found was Mucinous tumor of ovary in 2 cases (1.67%).

Benign tumors were commonly seen in 3rd decade, borderline tumors in 3rd to 6th decades of life and malignant tumor in 5th decade of life. The youngest patient was of age 9 years with Dermoid cyst of ovary. The oldest patient was of age 72 years and presented with Struma ovarii with Follicular carcinoma of Thyroid.

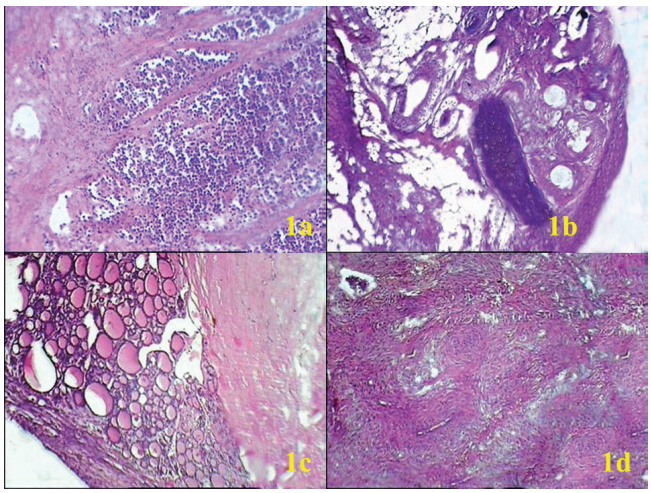

Figure-1: Microphotograph: 1a) Dysgerminoma showing tumor cells in nests separated by fibrous septa with lymphocytic infiltration. 1b) Mature cystic teratoma showing stratified squamous epithelium, cartilage, adipose tissue & hair follicles. 1c) Struma ovarii showing thyroid follicles with colloid material sharply delimited from ovarian stroma. 1d) Squamous cell carcinoma developing in mature cystic teratoma showing oval to polygonal tumor cells with hyperchromatic nuclei & moderate eosinophilic cytoplasm. (H & E, 100X)

Sr. No.	Type of tumor	No. of cases (%)
I)	Surface epithelial – stromal tumors	**84 (70%)**
A)	Serous tumors	66 (70%)
1)	Benign:	55
a)	Cystadenoma	53
b)	Papillary cystadenoma	02
2)	Borderline malignancy:	01
a)	Papillary cystadenoma	01
3)	Malignant:	10
a)	Adenocarcinoma	05
b)	Papillary adenocarcinoma	05
B)	Mucinous tumors	17 (14.17%)
1)	Benign:	11
a)	Cystadenoma	11
2)	Borderline malignancy:	02
a)	Mucinous cystadenoma	02
3)	Malignant:	04
a)	Adenocarcinoma	04
C)	Undifferentiated carcinoma	01 (00.83%)
II]	Sex cord - stromal tumors:	**07 (05.83%)**
1)	Granulosa cell tumor	01
2)	Granulosa-Theca cell tumor	01
3)	Fibroma	02
4)	Thecoma – Fibroma	01
5)	Sclerosing stromal tumor	01
6)	Sertoli - Leydig cell tumor	01
III]	Germ cell tumors:	**27 (22.50%)**
1)	Dysgerminoma	03
2)	Teratoma:	21
a)	Dermoid cyst	20
b)	Dermoid cyst with Squamous cell carcinoma	01
3)	Monodermal tumors:	03
a)	Struma ovarii	02
b)	Struma ovarii with Follicular carcinoma of thyroid	01
IV]	Metastatic tumors:	**02 (01.67%)**
1)	Krukenberg tumor	01
2)	Squamous cell carcinoma	01
	Total	120

Table-1: Showing different histological types of ovarian tumors

No.	Clinical manifestations	Benign tumors	Borderline tumors	Malignant tumors
1)	Pain in abdomen	82	02	21
2)	Lump in abdomen	45	02	17
3)	Gastrointestinal disturbances	14	02	11
4)	Fever	08	00	01
5)	Bleeding per vagina	04	00	02
6)	Amenorrhea	06	00	00
7)	Abdominal distension	02	00	01
8)	Change in voice	01	00	00
9)	Ascites	04	00	06
10)	Hepatomegaly	00	00	01

Table-2: Showing clinical manifestations in ovarian tumors

Sr. No.	Type of Tumor	No. of cases	1-5 cm	6-10 cm	11-15 cm	16-20 cm	21-25 cm	26-30 cm
1)	Benign	92	20	54	10	06	01	01
2)	Borderline	03	-	03	-	-	-	-
3)	Malignant	25	06	11	05	02	-	01
Total		120	26	68	15	08	01	02

Table-3: Showing sizes of ovarian tumors

Sr. No.	Type of Tumor	No. of cases	Cystic	Solid	Partly solid & partly cystic
1)	Benign	92	80	09	03
2)	Borderline	03	01	-	02
3)	Malignant	25	04	21	-
Total		120	85	30	05

Table-4: Showing gross appearance of ovarian tumors

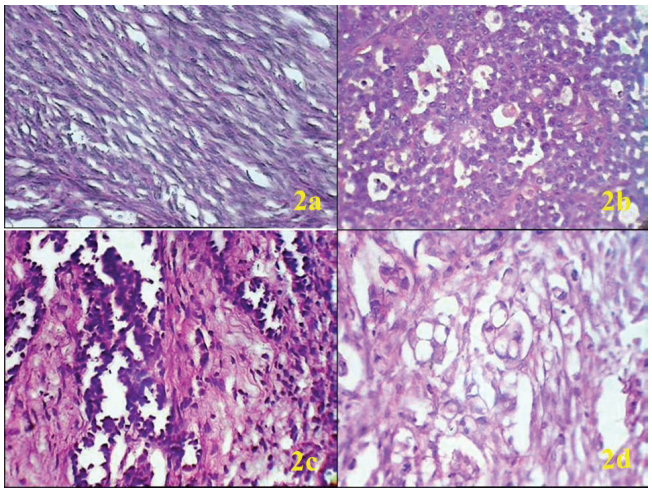

Figure-2: Microphotograph: 2a) Fibroma showing closely packed spindle stromal cells. 2b) Granulosa cell tumor showing round to oval tumor cells with Call-Exner body. 2c) Sertoli Leydig cell tumor showing tubular structures lined by Sertoli cells and oval Leydig cells. 2d) Krukenberg tumor showing signet ring cells with eccentric hyperchromatic nuclei and vacuolated cytoplasm in fibrous stroma. (H & E, 400X)

Out of 120 cases, 108 cases of ovarian tumors had unilateral presentation while 12 cases had bilateral presentation. Benign, borderline and malignant tumors commonly had unilateral presentation. In benign tumors, 54 cases of Serous cystadenomas were unilateral while 1 case was bilateral. Rests of benign tumors were unilateral. In malignant tumors, Serous adenocarcinomas were unilateral in 5 cases and bilateral in 5 cases, Mucinous adonocarcinomas were unilateral in 3 cases and bilateral in 1 case while metastatic tumors in ovary had both unilateral and bilateral presentation. Pain in abdomen was the predominant symptom of both benign and malignant tumors followed by lump in abdomen and gastrointestinal disturbances as shown in Table no.2. Benign tumors were in addition to this presented with fever in 8 cases, bleeding per vagina in 4 cases, amenorrhea in 6 cases, abdominal distension in 2 cases, change in voice in 1 case and ascites in 4 cases. Malignant tumors also were presented with fever in 1 case, bleeding per vagina in 2 cases, abdominal distension in 1 case, ascites in 6 cases and hepatomegaly in 1 case.

In present study, 97 cases (80.83%) of ovarian tumors were presented with symptoms of 1-6 months duration. 26 cases (21.67%) of benign tumors were presented with acute symptoms due to torsion.

In present study, 97 cases (80.83%) of ovarian tumors were observed in multiparous women. Ovarian cystectomy was the treatment of choice in 39 cases (32.50%) followed by TAH (Total abdominal hysterectomy) with BSO (Bilateral salpingo-oopherectomy) in 25 cases (20.83%), USO (Unilateral salpingo-oopherectomy) in 21 cases (17.50%), TAH with USO in 17 cases (14.17%). In malignant tumors, ovarian biopsy was done in 4 cases (3.33%), ovarian and omental biopsy in 1 case (0.83%), USO with omental biopsy in 1 case (0.83%), TAH with USO with omental biopsy in 4 cases (3.33%), TAH with BSO with omental biopsy in 5 cases (4.17%) and staging laprotomy was done in 3 cases (2.50%).

Out of 120 cases ovarian tumors, 68 cases including 54

cases of benign tumors, 3 cases of borderline tumors and 11 cases of malignant tumors were observed in the size range of 6-10 cm as shown in table no. 3. In benign tumors, largest tumor was Sclerosing stromal tumor with diameter 26 cm. In malignant tumors, largest tumor was Dysgerminoma with diameter 30 cm.

Benign tumors were commonly presented with having cystic spaces in 80 cases, borderline tumors as partly solid and partly cystic in 2 cases whereas malignant tumors were commonly presented as solid masses in 21 cases as shown in table no.4. It was observed that contents of cystic spaces in ovarian tumors were serous fluid (27 cases) followed by hemorrhagic material (24 cases), hairy / cheesy material (20 cases) and mucinous fluid (19 cases).

It was observed that, 15 cases of ovarian tumors were found in stage-I, 2 cases in stage – II and 9 cases in stage – III, of these 7 cases were in stage – IIIb and 2 cases were in stage – IIIc.

Out of 120 cases, total abdominal hysterectomy was done in 53 cases. From these hysterectomy specimens, microscopic study of endometrium and cervix was carried out. In endometrial study, 45 cases of proliferative endometrium, 3 cases of cystic glandular hyperplasia of endometrium, 2 cases of each of secretory endometrium and hyperplasia of endometrium and 1 case of each of

atrophic endometrium and endometrial polyp were observed. In cervical study, 48 cases of chronic cervicitis, 1 case of cervical dysplasia and 1 case of Squamous cell carcinoma of cervix were seen.

Fine needle aspiration cytology was done in 10 cases of ovarian tumors. Out of 10 cases, 5 cases were diagnosed as benign tumors, 2 cases were diagnosed as malignant tumors and in 3 cases only hemorrhagic aspirate was obtained on repeated aspiration and no cells were seen.

A detailed clinical history and a thorough physical examination were carried out in all cases and corroborative laboratory findings were noted.

DISCUSSION

Ovarian cancer is the leading cause of death among gynecologic malignancies. It is a well-established fact that neoplastic conditions of ovary form a complicating and baffling subject in the history of oncology. The neoplasm arising from it inherits a wide spectrum of histogenetic background much more varied from any other organ. Surface epithelial tumors of the ovary are the most frequently encountered tumors. Epithelial origin of ovarian tumors is found in more than 90% of ovarian tumors.[1] The terminology of borderline ovarian tumors (BOT) was first described by Taylor in 1929 which was then classified as 'low malignant potential tumors'. They were then subsequently separated from carcinomas and classified as 'borderline tumors' by WHO in 2003.[2] These borderline tumors were diagnosed on the basis of unusal degree of proliferation of the epithelial cells with cellular stratification with notable architectural atypia and the formation of papillary protuberances with the absence of stromal invasion. Naik PS et al[1] studied 110 cases of surface epithelial tumor (SET) over a period of 4 years. They found that benign tumors occurred in younger age group while malignant SET occur in the fifth and sixth decade which is comparable with our study. Mucinous tumors of the ovary are the second most common epithelial tumors. Only 5% of mucinous tumors were bilateral as compared to serous tumors which were usually bilateral. Shimada M et al[3] conducted the study to clarify the clinicopathological characteristics of 189 cases of mucinous adenocarcinomas and found maximum cases were in FIGO I-II stages which is comparable with our study. The sex cord stromal tumors are of low grade and present in younger age as compared to ovarian surface epithelial malignancies.[4,5,6,7] Their clinical manifestations are from precocious puberty to menorrhagia to postmenopausal bleeding. Granulosa cell tumors (GCT) are associated with simple endometrial hyperplasia and few cases showed association with endometrial carcinoma.[8] In our study also, female with GCT showed endometrial hyperplasia with clinical presentation of bleeding per vagina. Pectaides D et al[9] studied 34 patients with adult GCT with median age of 51 years and median size of tumor 10 cm which is comparable with our study. Nocito AL et al[10] studied 50 cases of thecoma and age ranged from 21 to 77 years with median age of 57.5 years. In our study, one case of thecoma was seen of age 60 years presented with bleeding per vagina. Zekioglu et al[11] and Mathur SR et al[12] studied sclerosing stromal tumors of the ovary with the age of patients ranged from 16 to 54 years and the tumor size ranged from 6-21 cm. In our study, we observed one case of sclerosing stromal tumor of age 35 years and having the largest size of about 26 cm in diameter. Akman L et al[13] studied 27 cases of Sertoli leydig cell tumors, median age was 45 years and maximum patients had stage I disease. In our study, we found one case of bilateral Sertoli leydig cell tumor with age of 45 years and had stage I disease. In present study, patient with Granulosa cell tumor have irregular menstruation and menorrhagia, patient with Thecoma-Fibroma have postmenopausal bleeding and patient with Sclerosing stromal tumor have cessation of menses. Among germ cell tumors, we found maximum 20 cases of mature cystic teratomas. Ovarian germ cell tumors are occurring predominantly in children and young women. Dermoid cyst is more common in young women but occasionally can be encountered at the extremes of ages. Study conducted by Grigoriadis C et al[14] studied ovarian tumors occurring in pregnant females and found that the most commonly diagnosed adnexal masses during pregnancy are the mature cystic teratomas, the endometrioid cysts and the corpus luteum cysts. Development of malignancy in a benign cystic teratoma of the ovary was rare. Most of cystic teratomas of ovary were predominantly lined by squamous epithelium, so it is not surprising that the commonest malignant neoplasm to develop is squamous cell carcinoma. Rekhi B et al[15] studied 12 cases of mature teratoma with squamous cell carcinoma and found age ranged from 31-61 years and size varied from 10 to 18 cm. We found 1 case of mature teratoma with squamous cell carcinoma of age 35 year and size of 10 cm in diameter.

Kondi-Pafiti A et al[16] did a clinicopathological study of 97 cases of metastatic neoplasms of the ovary and found 62.89% of the tumors were metastasized from extragenital organs and 37.11% tumors originated from the genital tract. We found a case of metastasis of squamous cell carcinoma in ovary in 35 year old female in a known case of squamous cell carcinoma of cervix. Similar study was conducted by Shimada M et al[17] showed that ovarian metastasis occurred commonly among patients with adenocarcinomas (5.31%) than those with squamous cell carcinomas (0.79%).

CONCLUSION

Clinical history including signs and symptoms, gross and microscopic examination should be studied properly as clinicopathological evaluation is important in diagnosis, management and prognosis of patient. Out of 120 cases, 92 cases (76.67%) were benign, 3 cases (02.50%) were borderline and 25 cases (20.83%) were malignant in nature. 84 cases (70%) of Surface epithelial-stromal tumors were observed followed by 27 cases (22.50%) of Germ cell tumors, 7 cases (5.83%) of Sex cord- stromal tumors and 2 cases (1.67%) of Metastatic tumors in ovary. From the clinico-pathological correlation of ovarian tumors in Sex cord - stromal tumors, it was observed that the main clinical features depend on hormonal imbalance. So in Granulosa cell tumor, patient had hyperplasia of endometrium and history of irregular menstruation and menorrhagia due to hyperoestrogenic effect. Similarly in Thecoma-Fibroma, patient had postmenopausal bleeding due to oestrogenic effect and in patient with Sclerosing stromal tumor, patient had cessation of menses and change in voice due to androgenic effect.

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