Original Research Paper

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Histopathological Study of Ovarian Tumors

Pathology

KEYWORDS: Ovarian Tumors, surface epithelial tumors, malignancy.

Dr Manjula Praveen Biradar — Associate professor, Shridevi Medical college and research institute, Tumkur.

Dr Praveen B Biradar — Consultant pathologist Bhagwan MahaveerJain Hospital Bangalore

ABSTRACT

Ovarian tumors(OT) account for the fifth most common cause of cancer related death in females involving variety of neoplastic entities. Diagnosis of various patterns of ovarian tumors is very important in the treatment and prognosis.

Aim : To study the occurrence of different histopathological types of ovarian tumors and their correlation with other studies.

Methods : A total of 105 cases of ovarian tumors were studied at the Department of Pathology, JSS Medical college and Hospital, Mysore, during the period of Jan 2004 to Dec 2005. Clinical presentation and physical findings of all the cases were recorded and tumors classified according to WHO classification.

Results : Among 105 cases, Surface epithelial tumors(SET) formed the largest group 67.16% followed by germ cell tumors(GCT) 22.86%, sex-cord stromal tumors(SCST) 8.57% and metastatic tumors 0.96% each. The commonest benign tumor was serous cystadenoma 35(44.87%) cases and malignant tumor being serous cystadenocarcinoma 9(39.13%) cases. The age range was 2-75yrs and abdominal mass was the commonest clinical presentation followed by pain abdomen.

Conclusion : SET are the commonest ovarian tumors followed by GCT as observed in other studies, both constituting 91.16%. Histopathological classification of OT along with clinical stage forms an integral part of evaluation of optimum mode of therapy.

Introduction:

Ovarian tumors account for about 30% of female genital cancers[1]. Asian countries and Japan have rates of 2-6.5 new cases per 1,00,000 women per year[2]. It accounts for 6% of total cancers in female and is the 5th most common form of cancer related death in females, ranked behind neoplasm of the lung, breast, intestine and uterus in United States and almost half of the deaths from gynaecological cancers[3].

The disease has highest fatality-to-case ratio to all the gynaecologic cancers. It is one of the most treatable tumors because majorities are sensitive to anti cancer therapies[4]. Ovarian tumors are generally difficult to detect until they are advanced in stage or size, as the symptoms are vague and manifest over time.

Diagnosis of various histological patterns of ovarian tumors is very important in diagnosis as well as prognosis of ovarian tumors. Ovary is the favourite site to get metastatic deposits from other abdominal cancers and approximately 65% of the metastatic tumors are bilateral. In this study, we tried to find out the histopathological patterns and their correlation with other studies.

Material and Methods:

This prospective study was done from Jan 2004 to Dec 2005 in the Department of Pathology, JSS Medical college and Hospital, Mysore. The material included only surgically resected specimens of ovarian tumors from JSS Hospital, Mysore. The data on history, clinical presentation and routine laboratory investigations were collected.

The specimens were fixed in 10% formalin. Paraffin blocks were made and sections were stained with H&E stain and reviewed. Special stains like Periodic Acid Schiff (PAS), Reticulin stain and Vangieson's (VG) were done wherever necessary. The lesions were classified and studied as per the WHO classification of ovarian tumors.

Results:

A total number of 105 cases were studied. The youngest patient in the study was 2yrs old and the oldest patient was 75yrs old. The highest overall incidence of OT occurred in 4th decade 32(30.5%) cases. Peak incidence of benign and malignant tumors was in the age group of 31-40yrs. Of 105 cases of OT, 78 (74.29%) cases were benign, 4 (3.8%) cases were borderline and 23 (21.90%) cases were malignant(Table-1).

Table: 1

Type	Number of cases (Percentage)
Benign	78(74.29%
Borderline	4(3.8%)
Malignant	23(21.90%)
Total	105(100%)

Unilateral involvement of ovarian tumors was most common in 94cases(89.52%) than bilateral 11 cases(10.48%) (Table-2). Right sided tumors (54.28%) were relatively more common than the left sided tumors (35.24%). The largest tumor (mucinous cystadenoma) in the present study measured 35x30x25 cms and the smallest tumor (serous cystadenoma) was 3x2x1cms. Majority of the tumors (44.76%) were showing mixed solid and cystic areas followed by (41.90%) being cystic in consistency. Only 14 cases were purely solid. Bilaterality was seen in 5 benign cases and 6 malignant cases.

Table-2

Site	Number of cases(Percentage)
Unilateral	94(89.52%)
Bilateral	11(10.48%)

The commonest histopathological types observed in the study were SET (both benign and malignant) 71 (67.61%) cases, followed by tumors of GCT 24 (22.86%) cases, SCST 9 (8.57%) cases and 1 (0.96%) case of metastatic tumor. Teratomas constituted 21 (20%) cases (Table-3). The commonest benign lesion was serous cystadenoma 35 (44.87%) cases and malignant tumor was serous cystadeno-carcinoma 9 (39.13%) cases.

Table-3

Histopathological Type	Number of cases(Percentage)
Surface epithelial tumor	71(67.61%)
Germ cell tumor	24(22.86%)
Sex cord stromal tumor	9(8.57%)
Metastatic tumor	1(0.96%)
Total	105(100%)

Histopathology:

SET : These tumors comprised the largest group of the total OT. Out of 71 cases, 48 were serous and 22 were mucinous. A single case of Brenner was noted. Out of 48 cases of serous tumors, 35 were cystadenomas, 2 were borderline and 9 cystadenocarcinoma (Fig1).

Mucinous tumors were the second commonest and included 22 (20.95%) cases amongst all the ovarian tumors. Of these, 16 cases were benign (63.63%), 2 (9.1%) cases of borderline malignancy and 6 (27.27%) cases of mucinous carcinoma were seen.

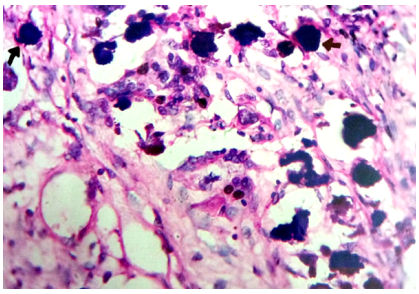

Fig 1: Serous cystadenocarcinoma showing Psomomma bodies.

GCT : This group of tumors were the second commonest tumor 24 (22.86%) of all ovarian tumors. Teratomas were the commonest germ cell tumor encountered and comprised of 21 (87.5%) cases of germ cell tumors and 20% of all ovarian tumors. Of these, 19 were benign cystic teratomas, one was mature cystic teratoma with malignant secondary change to squamous cell carcinoma(Fig 2) and one case was immature teratoma. 3 cases of dysgerminoma was observed in the study.

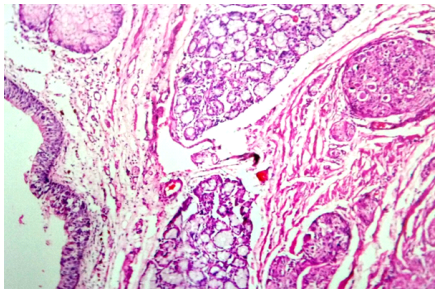

Fig 2 : Cystic teratoma showing sratified squamous epithelium with adnexal structures and squamous cell carcinoma.

SCST : Total number of cases in this group were 9 (8.57%). They constituted three granulosa cell tumor (Fig 3), one thecoma, three fibrothecomas and two fibromas. Two of the three granulose cell tumors were malignant.

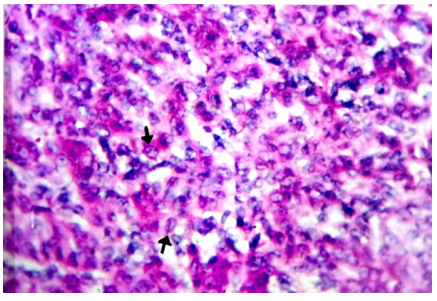

Fig 3: Granulosa cell tumor – arrows show nuclear grooving of cells

Metastatic Tumors : One case of krukenberg tumor was studied, which comprised 4% of all malignant ovarian tumors.

Discussion :

The tumors of the ovary pose many problems to the gynaecologist due to their high complication rate and they are the biggest diagnostic challenge in the field of gynecological oncology. The benign nature of the tumor to remain silent clinically for a long period of time tests the gynaecologist. Recent advances in cell biology have provided tools to explain the complex histogenesis and development of ovarian tumors as well as aid in early diagnosis. In our study, an attempt has made to study the histomorphology of tumors and correlate with other studies.

Of the 105 tumors in the present study, 78 (74.29%) cases were benign, 4 (3.8%) cases were borderline and 23 (21.9%) were malignant. This is almost similar to the data seen in studies done by Pilli et al[5] 75.2%, 2.8%, 21.9%, Nowak et al[6] 79.5%, 2.1%, 18.4%and Pradhan A et al[7] 79.5%, 2.4%,18%. A higher incidence 40.81% of malignant tumors was shown by Ahmad et al[8] in comparison to other studies. In a study by Tyagi et al[9], the malignant tumors outnumbered the benign tumors.

Among the different histopathological patterns, SET constituted majority of OT with 71 (67.61%) cases followed by GCT with 24 (22.86%) cases, SCST with 9 (8.57%) cases and 1 (0.96%) case of metastatic tumor similar to the results of many studies[8,10,11,12,13,14,15]. The commonest epithelial tumors were serous cystadenomas (35 cases, 49.30%) and mucinous cystadenomas (14 cases, 19.72%). Commonest among GCT was teratoma (21 cases , 87.5%). Similar observations were made by Tyagi et al[14] and Saxena et al[16]. However, Ramachandran et al[17] observed mucinous cystadenomas (26.52%) to be more common than serous cystadenomas (24.11%).

In this study age ranged from 2yrs to 75yrs with mean age being 40yrs which correlated to other studies[7,8]. Unilateral (89.52%) involvement was more common than bilateral (10.48%) coinciding with the findings of other studies[7,14,16]. The tumor with highest bilaterality was found in serous cystadenocarcinoma (36.36%).

Histopathology:

SET

Serous tumors were the commonest encountered epithelial tumors in the present study accounting to 48 (45.71%) out of the 105 cases studied, which was similar to other studies[5,18,19]. Serous cystadenoma (72.91%) was the most common among the serous tumors in this study which was comparable with the study by Saxena et al[16]. Serous cystadenocarcinoma (11.11%) comprised the most common malignant serous tumor which is in agreement with the findings reported by Ahmad et al[8].

Mucinous tumors : A total of 22 mucinous tumors were encountered, of which 14 (63.63%) cases were benign, 2 (9.09%) cases were borderline and 6 (27.27%) cases were malignant which was consistent with the study by Verma K and Bhatia[20].

Borderline Tumors : In the present study, we observed 2 cases (3.81%) each of borderline serous and mucinous tumor. Bostwick et al reported 67% of serous, 27.5% mucinous and 5.5% of seromucinous borderline malignancy.

Brenner tumor : One case of malignant Brenner tumor was seen accounting for 0.95% of all ovarian tumors and 1.14% of surface epithelial tumors. Similarly, Krigman et al[22] reported Brenner tumors to constitute 2% of all surface epithelial tumors. One case each of mucinous borderline and mucinous cystadenocarcinoma was associated with Brenner tumor.

GCT : The commonest germ cell tumor was teratoma accounting to 20% (21 cases) of all ovarian tumors and 87.5% (21/24 cases) among the germ cell tumors. Sah SP, Uprety D[23] et al in their study showed teratomas to be most common among the germ cell tumors(92%). All cases showed histomorphological features of a mature teratoma. However, in one case (0.96%) foci of squamous cell carcinoma was seen, accounting to 4.76% of all teratoma which was similar to study by Singh P et al[24](Fig 1). Dysgerminoma constituted to 12.5% (3cases) of germ cell tumors and 2.85% of all ovarian tumors. Mehta and Purandhare[25] reported 4.16 % of dysgerminoma in their study.

SCST : This group of tumors comprises of 5-8% of all ovarian tumors. In our study it comprised of 8.57% of all ovarian tumors compared to 11.7% of GG swamy study[26].

Metastatic Tumors : It comprises of 5-10% of all malignant ovarian

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tumors. In the present study, 1 (0.96%) case was metastatic tumor of all ovarian tumors observed which was similar to the study by Pilli et al[5] (0.7%). Microscopically, Krukenberg tumor comprised of signet ring cells staining positive for PAS (Fig 2 &3). The usual primary sources of krukenberg tumor are stomach, large bowel, appendix and breast[27]. Webb et al[28], in his study of 357 cases of cancer metastatic to the ovary reported that the primary site of cancer metastasis to the ovary were gastrointestinal (47%) comprising the commonest followed by breast (31%), genital 18% and other 15% while Petru et al[29], in the study of 82 nongenital cancers metastatic to the ovary reported primary carcinomas of the breast 34.1% to be the commonest.

Conclusion :

The diversity of ovarian neoplasms makes it mandatory to classify the tumors accurately by histopathological features following universally accepted classification. Squamous cell carcinoma arising in benign cystic teratoma and malignant Brenner were noted in this study.

Effective therapeutic management of ovarian malignant tumors continue to be a challenge to the oncologist. An accurate histopathological diagnosis combined with clinical staging will help in rendering prompt and appropriate treatment to the patients.

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