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Ovarian Tumors- A Histomorphological Analysis

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Abstract: ***Ovarian tumors are one of the most common tumors of female genital tract. Ovarian cancer is fifth leading cause of cancer death and carries highest mortality among gynecology. Objectives: This study is under taken to know the incidence, histomorphological features and clinicopathological correlation of various ovarian tumors. Methods : It is a study of one and half year from 1st June 2009 to 31st December 2010 in department of pathology at teaching institute. In our study non neoplastic lesions like simple ovarian cysts, tubo-ovarian masses and poly-cystic ovaries were excluded. A details histomorphological study and clinicopathologica; correlation of ovarian tumor is done. Results : The present study of ovarian tumors was undertaken for a period of one and half year. Total 89 cases were studied in this duration of study period. Patients were of age group 2nd to 7th decade with ovarian tumors. Out of 89 cases majority were benign tumors (84.3%), followed by malignant tumors (14.6%). A case of borderline tumor (1.1.2%) was also found. Surface epithelial tumors (60.67%), were the most common tumors followed by germ cell tumors (28.1%), sex-cord stromal tumors(10.1%) and one case of metastatic tumour(1.12%). Conclusion : This study concludes that benign ovarian tumors are more common from 3rd to 5th decade and the incidence of malignancy increases with age (5th decade onwards). Surface epithelial tumors are the most commonly occurring tumors followed by germ cell tumors and sex-cord stromal tumors respectively.***

Keywords: ovarian tumors; Histomorphological of ovarian tumors; clinico-pathological correlation of ovarian tumors.

1. Introduction

The ovaries are paired structures in the females reproductive system. The complex anatomy of ovary and its peculiar physiology during 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 tumours.[1]

Gynecological malignancy carries a high mortality amongst women of all ages. Cervical cancer is the most common pelvic malignancy among women worldwide [2] and for which screening modality is widely acceptable.[3] Ovarian cancer is a major cause of mortality in women because of its typical insidious onset and consequential late diagnosis.[4] It is considered as "Silent killer". [5,613]

Life time risk of developing an ovarian tumour is around 5-7%.[7]Majority of ovarian masses are benign (80%) and other 20% of these masses are malignant tumours.[8] Clinical features like abdominal pain, abdominal distension, pelvic pain, increased urinary frequency, abnormal vaginal bleeding, weight loss, constipation diarrhea, abdominal bloating and fatigue have all been reported.[9,10] Molecular basis or the clinicopathological characteristics of ovarian tumours remain poorly defined.[5,6] In majority of cases, this is only established by histological analysis of the surgical specimen.[11]

There are number of genetic and epigenetic changes that lead to ovarian carcinoma.[12] There is a desperate need for a better understanding of the molecular pathogenesis of ovarian cancer, so that new drug targets and biomarkers that facilitate early detection and treatment can be identified.[13] Over the last several years, it has been increasingly evident that a small population of cancer cells referred to as "Cancer stem cells" is responsible for the aggressiveness of the disease, metastasis and resistance to therapy.[14]

In 1973 World health organization (WHO) gave classification based primarily on gross features. In late1980, the International Society of Gynecological Pathologists gave a new classification, which is adopted, as a WHO classification.[15]

2. Methodology

The materials for the present study were ovarian tumour specimens received at the Department of Pathology in teaching institution, the duration of one and half year from June 2009 to December 2010 prospectively. Specimens were sent from the obstetrics and gynecology department. Clinical details were taken from the medical records of patients. The specimen were received in the form of oopherectomy/ salphingo-oophrectomy (unilateral/bilateral)/ Pan hysterectomy.

For morphological study gross photos have been taken of tumours. All the specimens of ovarian cysts and masses (> 3cm in maximum diameter) included and Non neoplastic ovarian lesions and cysts (<3cm in their maximum diameter) Simple ovarian cyst, Tuboovarian mass and Polycystic ovaries were excluded. Specimens were fixed in 10% formalin for 24hours. According to the standard grossing procedure specimens were examined and sections were given from representative areas from ovarian masses. Detailed Histopathological study was done on H&E stained sections and Special stains like PAS, Retic were studied whenever necessary.

3. Results

In present study, we studied prospectively a total of 89 cases of ovarian tumors in one and half year. Histomorphological features were studied and the tumors are classified according to WHO 2003 classification of ovarian tumors.

We included varied age group from 2nd decade to 7th decade patients. In study we found ovarian tumor incidence was seen more in 3rd to 5th decade age group, 78 cases among 89 total studied cases accounting to 87.6%.

Most of the patients presented with abdominal pain and mass per abdomen (58 cases around 65.2%) and 21 cases presented only with pain abdomen(23.6%), functional tumours presented with menstrual irregularities in 8 cases

(8.9%.). 3 cases presented with ascitis which were malignant tumor in advanced stage.

Out of 89 cases 68 (76.4%) cases were cystic in morphology , 13 cases were solid and 8 cases showed both solid and cystic morphology. Most of the Benign tumours were cystic, Sexcord stromal tumors and malignant tumors were solid in nature.

Most of the cases were unilateral 83(93.2), only 6 (6.7%) cases were bilateral.

Among these 75 (84.3%) cases were benign, 13 (14.5%) cases malignant and one case of borderline mucinous cyst adenoma.

Table 1: Broad classification of ovarian tumors depending on their cell of origin

Type of tumor	No of cases	Percentage (%)
Surface epithelial	54	60.67
Germ cell	25	28.1
Sex-cord stromal	9	10.1
Metastatic	1	1.12

In present study, ovarian tumours were classified according to WHO classification of ovarian tumors 2003 depending on their morphological and histopathological features. We got 17 various types of tumours. Among them benign tumours were more. In that, Serous cystadenoma cases accounted for 47.2% (42 cases), Mature cystic teratoma were seen in 21.34 %(19 case) of cases. 5.6%(5) cases of Mucinous cyst adenomas were seen and 5.6%(5) cases of Granulosa cell tumour, 3.34%(3) cases of fibrothecoma and 3.34% (3) cases of Serous adenocarcinoma, 3 cases of somatic type of teratoma associated with mature teratoma in that 2 cases were struma ovarii and a case of squmous cell carcinoma arising from mature cystic teratoma lining.

One case each of Borderline mucinous cystadenoma, Mucinous adenocarcinoma, Serous cystadenofibroma, Benign Brenner tumour, Immature teratoma, Thecoma, and Yolk asc tumour , Dysgerminoma and Metastatic mucinous adenocarcinoma from mucionous adenocarcinoma of colon respectively were found.

Figure 1: Gross picture – showing already formed Balls of pultaceous material containing tufts of hair
Figure 2: Microscopy – showing wall lined by stratified squamous epithelium and beneath that showing adnexal tissue. H&E 400X

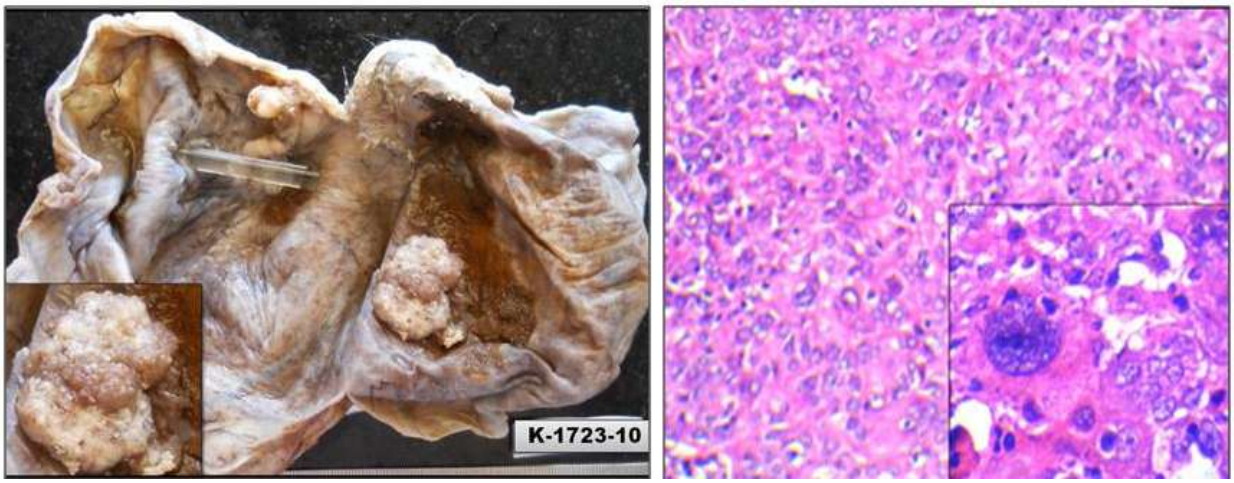

Figure 3: Gross- Somatic type of teratoma with Squamous cell carcinoma – showing thick cyst wall, teeth, and a solid grey white papillary structure. Insite showing close view of papillary projection
Figure 4: Microscopy – A- showing papillary projection lined by stratified atypical squamous cell, B - showing stromal invasion H&E 100X. Inset showing bizarre cell. H&E 400X

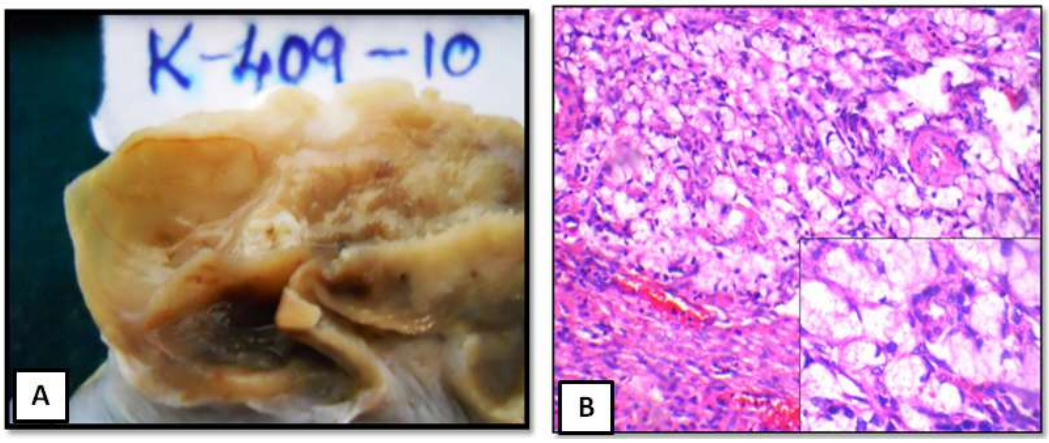

Figure 5: A) Ovary showing a small grey white small area in one ovary measuring 0.5X0.4cm. **B)** Microscopy- ovarian tissue and tumour deposit containing similar mucin containing clear cells as in colon H&E100X. Inset showing mucin containing Clear cells H&E 400X

4. Discussion

A total of 89 cases were studied in our present study. Out of which 77 (86.5%) were benign, 13 (14.6%) were malignant, 1(1.1%) was of borderline malignancy. A study by Pilli et al[16] also showed 75.2% benign, 2.8% borderline and 21.9% malignant which was in concordance with our study.

The tumors of the ovary can occur at any age even in children and in old age. In this study we got maximum number of cases in 3rd to 5th decade age group. The youngest case in the present series was a 11 year old who had yolk sac and oldest two patients were of 70 years old. Comparative analysis of age incidence is done with various other studies

Pilli et al[16] ,Jha R and Karki S et al[17] Kar et al[18] which was in concordance with our studies.

In our study almost half of the patients presented with combination of abdominal pain, mass per abdomen. Malignant tumours presented with ascitis and functional tumours caused menstrual irregularities. The most common symptom was abdominal pain followed by mass per abdomen. Comparative analysis of symptoms was done with Pilli et al[59] and Yasmin S et al[19] which were concordance with our studies.

Histologically total 89pateints who presented with ovarian tumours were studied. The tumours were classified according to WHO classification. The comparative analysis of study with other authors like Pilli et al[16] and Jha R and Karki S [17] showed the following data in table 2.

Table 2: Comparison of incidence of ovarian tumors with other studies (depending on cell of origin)

Tumour types	Pilli et al[16] (%)	Kar et al[18] (%)	Jha R and Karki S et al[17] (%)	Present study (%)
Surface epithelial tumours	71	79	52.2	60.67
Germ cell tumors	7	1.5	42.2	28.1
Sex-cord stromal	21	16	3.1	10.1
Metastatic	0.7	12	2.4	1.12

Further classification according to WHO 2003 classification of ovarian tumors in the the present study is compared with other studies is in concordance other studies. Among these surface epithelial tumors were the commonest of all the ovarian neoplasms. In that Serous cyst adenoma Accounted for 42 cases (47.2%) and the findings are in accordance with Kar et al[18] and Jha R and Karki S et al.[17] Age range was between 23 to 70 years. Microscopically they were lined by cuboidal to tall columnar ciliated or non-ciliated epithelium. Study by Kar et al[18] and Jha R and Karki S[17] 30% and 32% respectively. Next is the Germ cell tumors: accounted for 8 cases (9%) of the total ovarian tumors. Of these 4 cases were benign cystic teratoma, 3 were immature teratoma and 1 was dysgerminoma. Among these mature cystic teratoma comprised totally 19 (21.34%) cases. Most of the cases were in 3rd decade of life. They were predominantly cystic in consistency and microscopically mature derivatives of all the germ layers were present. 18% of mature cystic teratoma were found according to Yasmin S et al[19] which was in comparable with our study.

Three cases were of somatic type teratoma with mature teratoma in that two cases were monodermal in origin showing struma ovarii . One case of 62 year female with mature teratoma showed squamous cell carcinoma arising from squamous cell lining of cyst. 2% of mature tumours under go malignant transformation, most common is squamous cell carcinoma followed by adenocarcinoma and carcinoid.[20]

There was one (1.12%) case of metastatic adenocarcinoma from mucinous adenocarcinmoma of colon in 52 year female. It is comparable with Kar et al[18] showed 0.7% metastatic tumour and Jha R and Karki S et al[17] study showed 2.4% of metastatic tumour. Most common metstatic tumours of ovary are from GIT tumors stomach and colon.

5. Conclusion

This study concludes that benign ovarian tumors are more common from 3rd to 5th decade and the incidence of malignancy increases with age (5th decade onwards). Surface epithelial tumors are the most commonly occurring tumors

followed by germ cell tumors and sex-cord stromal tumors respectively.

Since ovarian tumors are not easily accessible by cytological study by means of FNAC or exfoliative cytology, so histomorphological analysis is the main diagnosticmodality. Ovarian cancer is not silent, rather its sound is going unheard.

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