HISTOPATHOLOGIC STUDY OF SURFACE EPITHELIAL TUMORS OF THE OVARY: A PROSPECTIVE STUDY

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ABSTRACT: BACKGROUND: Ovarian tumors are one of the most common tumors occurring in the female genital tract, among which the surface epithelial tumours predominate. **AIM:** This study was undertaken to study the various histomorphological patterns of surface epithelial ovarian tumors which occurred in female population in and around Mangalore and to correlates their incidence with respect to age and clinical features. **MATERIALS AND METHODS:** In our study non-neoplastic lesions like simple ovarian cysts, tuboovarian mass and polycystic ovaries were excluded. This study mainly includes all the surface epithelial ovarian tumors sent to the Department of Pathology at a medical college hospital, Mangalore. A prospective study was done from June 2008 to May 2010. A detailed histomorphological study was done. The correlation of these tumour was done with age, clinical presentation and histomorphological patterns. **RESULTS:** The present study of surface epithelial ovarian tumors for a period of two years included a total of 50 cases. Most of the patients with ovarian tumors were in the 2nd to 5th decade. Out of 50 cases majority were benign tumors (64%), followed by malignancy (26%) and (10%) case of borderline malignancy was found. Serous tumors (52%) were the most common tumors followed by mucinous tumors (40%). In malignant surface epithelial tumors, mucinous cystadenocarcinoma (10%) was common followed by serous cystadenocarcinoma (8%). **CONCLUSION:** Ovarian malignancies constitute about 6.6% of all malignant tumours of the female genital tract. In India, the ovary is next in importance to cervix and endometrium as the seat of cancer of female genital tract. Despite the new techniques in imaging and genetics the diagnosis of ovarian tumours is primarily dependent upon histopathological examination. Our study showed serous cystadenomas as the most common lesion.

KEYWORDS: Surface epithelial ovarian tumors, Benign, Malignant.

INTRODUCTION: The complex anatomy of ovary and its peculiar physiology with constant cyclical changes from puberty to menopause give rise to number of cell types each of which is capable of giving rise to tumors.¹ No age group is free from the tumours. Different tumors tend to involve different age groups preferentially. Ovary is a striking exception to the old dictum of Virchow that the organs which are frequently the seat of primary cancer, are rarely involved in secondaries and vice versa. Both primary and secondary tumours of the ovary are relatively frequent showing variety of pathological patterns.² Surface epithelial ovarian tumours constitute 65.7% of all ovarian tumours. They exist in different histological patterns and exhibit varying degrees of aggressiveness.³ The main aim lies in distinguishing ovarian neoplasms from the wide spectrum of non-neoplastic lesions. Despite the new techniques in imaging and genetics the diagnosis of ovarian tumours is primarily dependent upon histopathological examination. The present study is being undertaken to review in detail the different varieties of ovarian tumours in and around Mangalore and assess their characteristics with regards to incidence age and histopathological type.

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MATERIALS AND METHODS: The materials for the present study were ovarian surface epithelial tumour specimens received at the Department of Pathology of a medical college hospital, private nursing homes and hospitals in and around Mangalore between June 2008 to May 2010. This prospective study was done for a period of 2 yrs from June 2008 to May 2010. All specimen were received in 10% formalin and relevant clinical information was obtained. The specimen were then subjected to gross description and adequate sampling by appropriate tissue section. The microscopic features were studied with routine haematoxylin and eosin stained sections.

RESULTS: A total number of 50 cases were studied.

HISTOMORPHOLOGICAL TYPES OF OVARIAN TUMORS: The histomorphological type as per the main heads of the WHO classification is shown in Table 1.

Most of the cases were seen in the age group of 31- 40 years. The lowest age in which the tumour found was a 19yr old girl. This was diagnosed as serous cystadenoma, which was the most common tumour in our study. The oldest lady aged 66 years, presented with abdominal discomfort. Histo-pathological examination confirmed a diagnosis of poorly differentiated serous papillary cystadenocarcinoma with metastasis in omentum, parametrium and cervix. Out of 50 cases studied totally, only 9 cases had bilateral involvement and the remaining 41 cases had unilateral involvement. Out of 50 cases, there were 31 cystic cases, 3 cases of solid lesions and 16 cases of both cystic & solid lesions. The 3 solid lesions were malignant, 2 being mucinouscystadenocarcinoma and 1 serous cystadenocarcinoma.

BENIGN/MALIGNANT LESIONS: The number of tumors which were benign/malignant is shown in Table2.

HISTOMORPHOLOGICAL PATTERNS OF OVARIAN TUMOURS: The histomorphological patterns of ovarian tumours is shown in Table 3.

DISCUSSION: A total of 50 cases of surface epithelial tumours were studied in our present study. Out of these 50 cases, 32 (64%) were benign, 5(10%) were of borderline malignancy and 13(26%) were malignant.

DISTRIBUTION OF TUMOURS ACCORDING TO THE AGE: In this study, we got a maximum number (64%) of cases in 31-50 yrs age group. The youngest case in the present series was a 19 yrs old girl diagnosed with serous cystadenoma and oldest patient was 66 yrs old and was diagnosed to have poorly differentiated serous papillary cystadenocarcinoma with metastasis in the omentum, parametrium and cervix. The present study is in concordance with studies by Karet al⁴ and Jha et al⁵, where most of the cases were seen between 30-50 yrs of life.

MODE OF PRESENTATION: In the present study, the patients presented with a combination of clinical symptoms consisting of abdominal discomfort, pain abdomen, mass per abdomen and menstrual irregularities. Half of the patients presented with abdominal discomfort or distention. The present study is in concordance with studies by Olson et al⁶ and Pilli et al⁷, both which showed similar results.

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UNILATERAL/BILATERAL INVOLVEMENT: Out of 50 cases studied totally, only 9 cases had bilateral involvement and the remaining 41 cases had unilateral involvement, 26 cases being left sided. The present study was consistent with Jha et al⁵ which showed higher percentage of unilateral tumours. Kar et al⁴ showed a slightly higher percentage of bilateral tumours than our study.

GROSS FINDINGS:

SIZE: In the present study the tumours ranged in size from 2 to 27 cms in diameter. The smallest tumour had a size of 2 cm in diameter that was detected in a 36 yr old female diagnosed as serous cystadenoma of ovary. The largest tumour measured 27 cm in diameter in a 45 yr old lady diagnosed as serous papillary tumour of borderline malignancy. This finding showed correlation with Pilli et al⁷ study, which showed similar findings.

CONSISTENCY: In the present study, out of total 50 cases, 31(62%) cases were cystic, 3(6%) were solid, 16(32%) had both solid and cystic areas. Most of the cystic lesions were benign. The present study is consistent with the study done by Kar et al.⁴ The study by Maheshwari et al⁸ shows a higher percentage of cystic lesions.

BENIGN/MALIGNANT LESIONS: Out of 50 cases, 32(64%) were benign and 13(26%) were malignant and 5 cases (10%) were of borderline malignancy. This was similar to the findings by Karet al.⁴ The study by Jha et al⁵ did not show any tumours of borderline malignancy.

DISTRIBUTION OF OVARIAN TUMOURS ON THE BASIS OF MICROSCOPIC DIAGNOSIS: Histologically, a total 50 patients who were diagnosed with surface epithelial ovarian tumours were studied. The tumours were classified according to the WHO classification. Serous tumours (52%) were the most common, followed by mucinous tumours (40%). 8% of the cases were other surface epithelial tumours.

HISTOMORPHOLOGICAL PATTERNS OF OVARIAN TUMOURS: In the present study, serous tumours were the commonest of all the surface epithelial ovarian neoplasms.

SEROUS CYSTADENOMA: Accounted for 19 cases (38%) with most of them being unilateral and cystic in consistency. Peak incidence was seen in the 3rd and 4th decade. The largest specimen measured 16x14x5cms and smallest measured 2cm in diameter. Microscopically they were lined by cuboidal to tall columnar ciliated or nonciliated epithelium. Seidman et al⁹ studied 113 benign ovarian serous tumours, of which 76 were serous cystadenomas and 37 were serous cystadenofibromas. The mean patient age in their study was 60 years and the mean tumor size was 5.7 cm. Eighteen percent of patients had bilateral tumors. There were 36 unilocular serous cysts (32%), 40 multilocular serous cysts (35%), and 37 cystadenofibromas (33%).

SEROUS CYSTADENOFIBROMA: 4(8%) cases of serous cystadenofibroma have been seen in the present study. Most of them were reported in the 3rd decade of life. The largest specimen measured 8x7x6cms and smallest measured 5x4x2cms. Cut section showed cystic spaces with firm whitish solid areas and cystic areas containing clear serous fluid.

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Microscopically, all cases in our study consisted of a cyst wall lined by ciliated columnar epithelium with cellular fibrous stroma with proliferating spindle cells.

BORDERLINE SEROUS TUMOUR: 2(4%) cases of borderline serous tumour were found in the present study. Both the specimen were left sided cystic masses, which measured 27cms and 12 cms in diameter with a smooth surface. Microscopically, increased complexity of stromal papillae with the stratification of the epithelium and mild to moderate nuclear atypia of the cells without infiltration into stroma was seen. Kar et al⁴ reported an incidence of 9% in their series.

SEROUS CYSTADENOCARCINOMA (FIGURE 1): 4 cases (8%) of serous cystadenocarcinoma have been observed in the present study. Peak ages of malignant tumours were seen in 5th to 6th decade of life in present study. The youngest patient in our study was 38yrs old and the oldest was 66 yrs old. Microscopically, the tumour cells were arranged in glandular, papillary and solid patterns. The papillae showed irregularly branching with multilayered pleomorphic epithelium with areas of stromal invasion.

MUCINOUS CYSTADENOMA: Comprised of 10 cases (20%) out of 50 cases.

All of them were cystic in consistency. Similar findings have been reported by Kar et al⁴ 12% and Maheshwari et al⁸ 13 %. The largest specimen in the present study measured 25x13x13cms and the smallest specimen measured 3.5x2x2 cms. All the specimen were multilocular and contained mucinous gelatinous fluid. One case of mucinous cystadenoma was associated with benign cystic teratoma in our study. Tang et al¹⁰ also reported a case of mucinous cystadenoma associated with mature cystic teratoma.

BORDERLINE MUCINOUS TUMOUR (FIGURE 2): 3 cases (6%) of borderline mucinous tumour were reported out of 50 cases in the present study. All were solid cystic masses, the largest measuring 7x5x4 cm and smallest measuring 6x5.5x4cms. No cases of borderline mucinous tumour was seen in the other studies.

MUCINOUS CYSTADENOCARCINOMA: 5 cases (10%) of mucinous cystadenocarcinoma were reported in the present study. Microscopically, all tumours in the present study showed both solid and cystic patterns, predominantly made up of solid areas with complex stratification of lining endocervical or intestinal epithelium and marked pleomorphism. The tumour cells were seen invading into adjacent stoma. One patient, aged 40 yrs, had mucinous cystadenocarcinoma with endometrioid adenocarcinoma. Another patient, aged 47 yrs, was diagnosed with bilateral papillary mucinous cystadenocarcinoma with synchronous moderately differentiated adenocarcinoma of ascending colon. Adenocarcinomas of the large bowel are particularly important because of their relatively high frequency and their ability to simulate primary ovarian carcinomas, mainly of mucinous and endometrioid types but sometimes also of clear cell type.

Features favouring a primary ovarian tumour are an expansile (pushing) pattern of invasion, a complex papillary architecture, size over 10 cm, a smooth external surface and the presence of benign or borderline appearing foci. Features favouring metastasis from large bowel are bilaterality, surface involvement by tumour cells, infiltrative or nodular pattern of invasion, ovarian hilar

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involvement, single cell invasion, signet ring cells, cribriform growth pattern, dirty necrosis, segmental destruction of glands, lack of squamous metaplasia, and vascular invasion. The prevailing opinion at present is that the large majority of these tumours are metastatic to the ovary and peritoneal cavity from an intestinal or appendiceal origin.¹¹

BRENNER TUMOUR (FIGURE 3): Among the remaining epithelial tumours, 1(2%) case of malignant Brenner tumour was found in our study. This patient was 57 yrs old and presented with left sided abdominal discomfort since 2 months. The specimen measured 5x4x2cms and was solid cystic. Cut section revealed firm homogenous white surface. Microscopically, the tumour showed multi-layered atypical transitional cell epithelium, classic nuclear grooving and abundant mitoses along with evidence of stromal invasion. Hemalatha et al¹² studied a case of bilateral malignant Brenner tumour measuring 15x12x8 cm on the right side and 8x5x4 cm on the left side. Yamamoto et al¹³ studied two cases of malignant Brenner tumour which were solid cystic, as in our study.

ENDOMETRIOID TUMOUR (FIGURE 4): 2 cases of endometrioid tumours (4%) were seen out of 50 cases. Microscopically, they showed a glandular tumour resembling adenocarcinoma of the endometrium. The glands were small and relatively uniform in size and shape. The glands are lined by columnar cells with amphophilic to basophilic cytoplasm. The nuclei are basally located, round or oval, and contained nucleoli. The findings of the present study are consistent with the study by Karet al⁴. McMeekinet al¹⁴ studied 91 cases of endometrioid carcinoma of ovary and found that 14 cases (15%) were associated with synchronous endometrial carcinoma.

CLEAR CELL ADENOCARCINOMA (FIGURE 5): 1 case of clear cell adenocarcinoma (2%) was seen out of 50 cases. The patient was 58 yrs old and presented with left sided abdominal discomfort of 6 months duration. Microscopically, the tumour showed a solid pattern consists of sheets of clear cells separated by delicate fibro vascularstroma. The cells were polyhedral with abundant clear cytoplasm and eccentric nuclei or hobnail cells with bulbous, hyperchromatic nuclei bulging into luminal spaces. Maheshwari et al⁸ showed an incidence of 0.79% of clear cell adenocarcinoma, with similar microscopic features. Takano et al¹⁵ studied 254 cases of clear cell adenocarcinoma and reported that the mean age of diagnosis was 52.4 yrs, which is consistent with our study.

CONCLUSION: A total of 50 cases were studied, out of which benign tumors were the most common (64 %), followed by malignancy (26 %) and 5 cases(10%) of borderline malignancy. Most of the benign tumors were unilateral, the cases which showed bilateral involvement were mostly malignant. The maximum number of cases in the present study were seen in the age group of 31-60 years. The most common symptom (50%) was abdominal discomfort/distention followed by abdominal pain(30%). The tumors ranged in size from 3 to 30cms in diameter. Serous cystadenoma was the most common neoplasm found and accounted for 19 cases (38%), followed by mucinous cystadenoma, which accounted for 10 cases (20%). 4 cases of serous cystadenofibroma (8%), 2 borderline serous tumours (4%) and 4 serous cystadenocarcinoma (8%) were found in the present study. Out of the 18 mucinous tumours, 10 were benign (20%), 3 were of borderline malignancy (6%) and 5 were malignant (10%). One case of mucinous cystadenoma was associated with benign cystic teratoma. One case each of mucinous cystadenocarcinoma was found to be associated with

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endometrioid carcinoma and synchronous adenocarcinoma of ascending colon respectively. One case each of clear cell adenocarcinoma and malignant Brenner tumour were also found in the present study.

Sl. No	Histological Types	Number	Percentage
1	Serous Tumors	26	52%
2	Mucinous Tumors	20	40%
3	Endometrioid Tumors	2	4%
4	Brenner Tumors	1	2%
5	Clear Tumors	1	2%
Total		50	100%

Table 1: Histomorphological Types

Sl.No.	Type of lesion	Number	Percentage
1	Benign	32	64%
2	Borderline	5	10%
3	Malignant	13	26%

Table 2: Benign/ Malignant Lesions

Sl. No.	Type of tumor	Number	Percentage
1	Serous Cystadenoma	19	38%
2	Serous Cystadenofibroma	4	8%
3	Borderline Serous Tumor	2	4%
4	Serous Cystadenocarcinoma	4	8%
5	Mucinous Cystadenoma	10	20%
6	Borderline Mucinous Tumor	3	6%
7	Mucinous Cystadenocarcinoma	4	8%
8	Endometrioid Carcinoma	2	4%
9	Clear Cell Adenocarcinoma	1	2%
10	Brenner Tumor	1	2%
	Total	50	100%

Table 3: Histomorphological patterns of ovarian tumour

Fig.1: Microphotograph of Papillary Serous Adenocarcinoma

Fig. 2: Microphotograph of Borderline Mucinous Tumour

Fig. 3: Microphotograph of Malignant Brenner Tumor

Fig. 4: Microphotograph of endometrioid adenocarcinoma

Fig. 5: Microphotograph of Clear Cell Adenocarcinoma

REFERENCES:

1. Prat J. Female reproductive system. In: Damjanov I, Linder J, eds. Anderson's pathology. St. Louis, Missouri: Mosby, 1990; 2231-309.
2. Louisa WY, Dainty G, Scott R, et al. Gynecological malignancies in women aged more than 25 years. *Am J Obstet Gynecol* 2005;105:1405-9.
3. Maheshwari V, Tyagi SP, Saxena K, et al. Surface epithelial tumors of the ovary. *Indian J Pathol Microbiol* 1994; 37: 75-85.
4. Kar T, Kar A, Mohapatra PC. Intra-operative cytology of ovarian tumours. *J Obstet Gynecol India* 2005;55:345-9.
5. Jha R, Karki S. Histological pattern of ovarian tumors and their age distribution. *Nepal Med Coll J* 2008;10:81-5.
6. Olson SH, Mignone L, Nakraseive C, et al. Symptoms of ovarian cancer. *Obstetrics and Gynecology* 2001;98:212-7.
7. Pilli GS, Suneeta KP, Dhaded AV, Yenni VV. Ovarian tumours: A study of 282 cases. *J Indian Med Assoc* 2002;100:420, 423-7.
8. Maheshwari V, Tyagi SP, Saxena K. Surface epithelial tumours of the ovary. *Indian J Pathol Microbiol*. 1994;37:75-85.
9. Seidman JD, Mehrotra A. Benign ovarian serous tumors: a re-evaluation and proposed reclassification of serous cystadenomas and cystadenofibromas. *Gynecologic oncology* 2005;96:396-401.
10. Tang P, Soukary S, Kahn E. Mature Cystic Teratoma of the Ovary Associated with Complete Colonic Wall and Mucinous Cystadenoma. *Annals of Clinical & Laboratory Science*. 2003;33: 465-70.
11. Rosai J. Female reproductive system - ovary. In: Rosai J, eds. Rosai and Ackerman's surgical pathology. Missouri: Mosby 2004; 1461 - 539.
12. Hemalatha KL, Prakash A. Bilateral malignant Brenner tumour of ovary. *J Obstet Gynecol India* 2005; 55:81-2.
13. Yamamoto R, Fujita M, Kuwabara M, et al. Malignant Brenner Tumors of the Ovary and Tumor Markers. *Japanese Journal of Clinical Oncology* 2009;29:308-13.
14. McMeekin DS, Burger RA, Manetta A, Disaia P, Berman ML. Endometrioid adenocarcinoma of ovary and its relationship to endometriosis. *Gynecologic Oncology* 1995; 59: 81-6.
15. Takano M, Kikuchi Y, Yaegashi N, et al. Clear cell carcinoma of the ovary: a retrospective multicentre experience of 254 patients with complete surgical staging. *British Journal of Cancer* 2006;94:1369 -74.

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