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# Gross and Histopathological Studies of Ovarian Tumors with Special Reference to Sex Cord Stromal Tumours-A Hospital Based Study

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**ABSTRACT**

*The aim of the study was to evaluate the frequency of histopathologically diagnosed ovarian tumour with special reference to sex cord stromal tumours cases attending a tertiary level medical facility based hospital in Guwahati. Total of 102 cases of ovarian tumours were studied. Abdominal mass was the most predominant clinical presentation. The cases were investigated and surgically treated. The formalin fixed specimens ( simple oophorectomy or hysterectomy with unilateral /bilateral salpingo-oophorectomy) were examined grossly ,processed routinely and the sections were stained with H& E stain and special stain-Periodic Acid Schiff was done wherever indicated. The microscopic findings were noted and interpreted according to WHO classification. Surface epithelial tumour was the commonest tumour according to the histogenesis. Among the malignant surface epithelial tumours, the incidence of mucinous cystadencarcinoma was 6.86% and serous cystadenocarcinoma was 2.94% . Serous cystadenoma was the commonest tumour in benign category. In germ cell tumour category, benign cystic teratomas constituted highest numbers (26.47%), followed by dysgerminoma(1.96%). Six cases of sex cord stromal tumour ( 4 cases of granulose cell tumour & 2 cases of Sertoli Leydig cell tumour) and 2 cases of kruckenberg tumour were also detected in the study. Sex Cord Stromal tumours comprises of approximately 5% of all ovarian neoplasm.*

**Key Words:** *Surface epithelial tumour, Granulosa cell tumour , Sertoli leydig cell tumour, Yolk sac tumour, kruckenberg tumour*

## INTRODUCTION

Ovaries are paired pelvic organs located on the sides of the uterus close to the lateral pelvic wall behind the broad ligament and anterior to the rectum. Ovarian cancers accounts for approximately 6% of all cancers in the female and is the fifth most common malignant tumours among women in the USA with an annual incidence of 22,000 new cases. In India the scenario is far more worse. Tumors of the ovary are amazingly diverse pathologic entities due to the three cell types that make up the normal ovary: the multipotential surface (coelomic) covering epithelium, the totipotential germ cells, and the multipotential sex cord/stromal cells. Each of these cell types gives rise to a variety of tumors [1]. Each of these tumours can present as cystic, adenofibromatous or solid tumour. Depending on the tumour cell morphology, proliferative pattern and and other associated finding like hemorrhage, necrosis and calcification & nuclear atypia, stratification, it may be graded as benign, borderline and malignant tumour [2]. Neoplasms of surface epithelial origin account for the great majority of primary ovarian tumors, and in their malignant forms account for almost 90% of ovarian cancers. Germ-cell and sex cord/stromal cell tumors are much less frequent and, although they constitute 20% to 30% of ovarian tumors, are collectively responsible for fewer than 10% of malignant tumors of the ovary [2]

..Sex Cord- Stromal comprises approximately 5% of all ovarian neoplasm and differentiate in the direction of sex cords and\or specialized ovarian stroma Granulosa cell tumour. This tumour produces granulosa cells, which normally are found in the ovary. It is malignant in 20% of women diagnosed with it. It tends to present in women in the 50-55yrs age group with post menopausal vaginal bleeding. Uncommonly, a similar but possibly distinct tumour, juvenile granulosa cell tumour, presents in pre-pubertal girls with precocious puberty. In both groups, the vaginal bleeding is due to oestrogen secreted by the tumour. In older women, treatment is total abdominal hysterectomy and removal of both ovaries. In young girls, fertility sparing treatment is the mainstay for non-metastatic disease.

**Sertoli–Leydig cell tumour** is a group of tumours composed of variable proportions of Sertoli cells, Leydig cells, and in the case of intermediate and poorly differentiated neoplasms, primitive gonadal stroma and sometimes heterologous elements.. The yearly adjusted incidence rate of Sex Cord-Stromal tumours is 2.1\1000 000 The present study was carried out with aim to evaluate the frequency of..Sex Cord- Stromal comprises approximately 5% of all ovarian neoplasm and differentiate in the direction of sex cords and\or specialized ovarian stroma.

Indian Cancer Registry data project ovary as an important site of cancer in women, comprising up to 8.7% of cancers in different parts of the country [3]. In Assam, relative proportion of ovarian cancers were detected was 4.9% [4].The present study was carried out with aim to evaluate the frequency of histopathologically diagnosed ovarian tumor cases with special reference to Sex cord stromal tumours attending a tertiary level medical facility based hospital in Guwahati.

## METHODOLOGY

The present research is based on a study of 102 specimens of ovarian tumours received in the Department of Pathology, Gauhati Medical College from the gynecology OT during the period from 1st June 2011 to 31st May 2012. The study was cleared by Institutional ethical committee of GMCH prior to the start of the research. Written Consent of patient was taken. Most of the patients presented with mass abdomen followed by pain abdomen, irregular menstruation ,amenorrhoea ,Constipation and urinary complaints . Investigations were done according to patients' requirement and managed surgically. Specimens were fixed in 10% formalin solution.

The nature of specimen was either in the form of simple oopherectomy or hysterectomy with unilateral /bilateral salpingo-oopherectomy. For gross examination, we followed the guideline described by Rosai J Ackerman,s Surgical pathology[1]. Omentum was looked for any nodularity. Lymph nodes were also dissected out and all were processed for HPE. On the basis of the gross finding, the sections were taken, processed routinely and stained with Haematoxylin & Eosin stain and wherever indicated the following special stain was also used-Periodic acid schiff stain for glycogen. The microscopic slides were viewed under low power field and high power field. The findings were noted and interpreted according to WHO classification.

## RESULTS AND OBSERVATION

The most common clinical presentation was abdominal swelling for both benign and malignant variety (95.09%). In analyzing the age distribution, we have found that ovarian tumours are commonest in the age group of 31-40 year (36.27%). Out of the 102 ovarian tumours, 46 cases (45.09%) were cystic, 42 cases (41.17%) were solid/cystic and 14 cases (13.74%) were predominantly solid tumours[Table1]. Bilaterality was detected in 8.86% of the total cases.Most of the benign ovarian tumour presented as cystic mass. Surface epithelial tumour was the commonest tumour according to the histogenesis (Cite Figure 1).

Among the malignant surfaceepithelial tumours, the incidence of mucinous cystandencarcinoma was 6.86% and serous cystadenocarcinoma was 2.94%. Serous cyst adenoma was the commones tumour in benign category. In germ cell tumour category, benign cystic teratomas constituted highest numbers (26.47%), followed by dysgerminoma(1.96%). Six cases of sex cord stromal tumour ( 4 cases of granulose cell tumour & 2 cases of Sertoli Leydig cell tumour) and 2 cases of kruckenberg tumour were also detected in the study (Cite Table II,III). Germ cell tumour was found in age group -1 year-40 years.

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**TABLE I** Showing Consistency of The Tumours and Their Percentage(Total Cases-102)

| Consistency | No. of cases | Percentage |
|---|---|---|
| Cystic | 46 | 45.09 |
| Cystic/Solid | 52 | 41.17 |
| Solid | 14 | 13.74 |

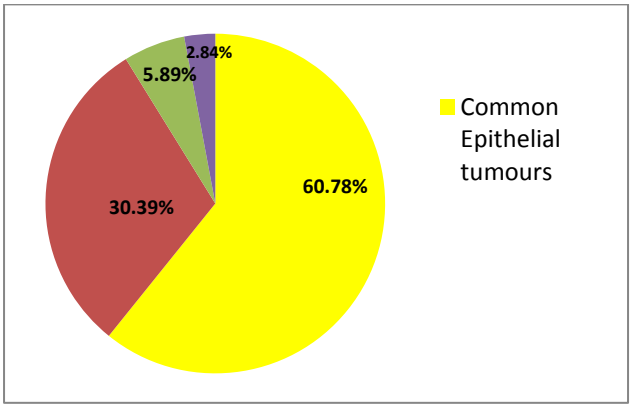



**Figure 1.** Frequency of Ovarian Tumour according to histogenesis

**Table II** Showing break-up of different ovarian tumours (Total- 102)

| Tumours | No. | % |
|---|---|---|
| **Surface Epithelial tumours** | **62** | **60.78** |
| **A. Benign** | 49 | 48.03 |
| i. Serous cystadenoma | 35 | 34.31 |
| ii. Papillary serous cystadenoma | 2 | 1.96 |
| iii. Mucinous cystadenoma | 12 | 11.76 |
| **B. Borderline** | 1 | 0.98 |
| Mucinous borderline | **12** | **11.76** |
| **C. Malignant** | 7 | 6.86 |
| i. Mucinous cystadenocarcinoma | | 2.94 |
| ii. Serous cystadenocarcinoma | 3 | 1.96 |
| iii. Endometrioid carcinoma | **2** | |
| **Germ Cell tumours** | 31 | |
| i. Benign cystic teratoma | 27 | **30.39** |
| ii. Immature teratoma | 1 | 26.47 |
| iii. Dysgerminoma | 2 | 0.98 |
| iv. Yolk sac tumour | **1** | 1.96 |
| **Sex cord stromal tumours** | 6 | **5.89** |
| i. Granulosa cell tumour | 4 | 3.92 |
| ii. Sertoli Leydig cell tumour | **2** | 1.96 |
| **Others** | 3 | **2.94** |
| i. Malignant mixed mullerian tumour | 1 | 0.98 |
| ii. Krukenberg tumour | 2 | 1.96 |

**SEX CORD STROMAL TUMOURS (6)**

6 cases out of 102 ovarian tumours were found to be sex cord stromal tumours. Together they constitute 5.89% of the ovarian tumours, which included granulosa cell tumours (4) and sertoli- leydig cell tumour (2)

**a) Granulosa Cell Tumour (4)**

Clinically patient presented with lump abdomen and bowel and bladder involvement. The surface showed longitudinal grooving,. Microfollicle formation was seen at places, the rest of the tumour cells were mostly present in a solid pattern. Sections taken form opposite ovary, omentum, bowel, bladder and peritoneum showed infiltration by tumour cells.

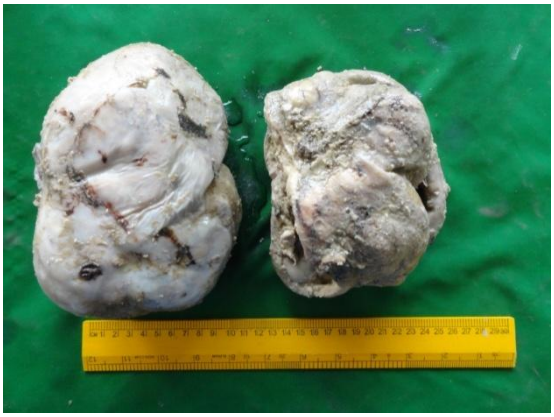
**b) Sertoli- Leydig Cell Tumour (2)**

The patients presented with lump abdomen. Grossly, size and weight ranged from 4-5 cm in diameter and 800-900 gm. It had brownish grey colour and cut

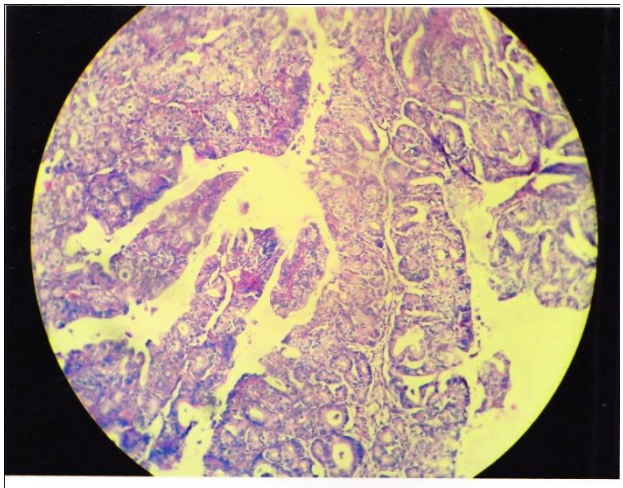
surface showed variegated appearance with areas of heamorrhage and necrosis. Microscopically, tumour was composed of masses of spindle cells in a sarcomatoid pattern with small areas showing tubules lined by sertoli like cells.

**Table III** Sex cord stromal Tumours (6 out 102 tumours)

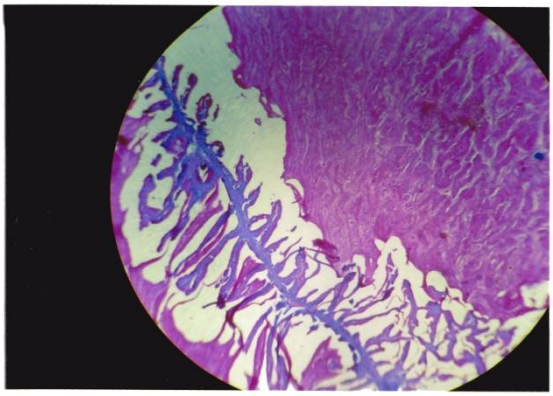
| Neoplasms | Number | Percentage | Bilateral |
|---|---|---|---|
| A. Granulosa cell tumour | 4 | 3.92 | |
| B.Sertoli Leydig cell tumours | 2 | 1.96 | |



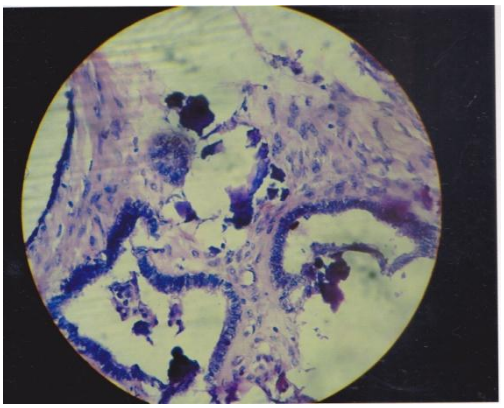
Gross Picture Of Mucinous Cyst Adeno-Carcinoma.



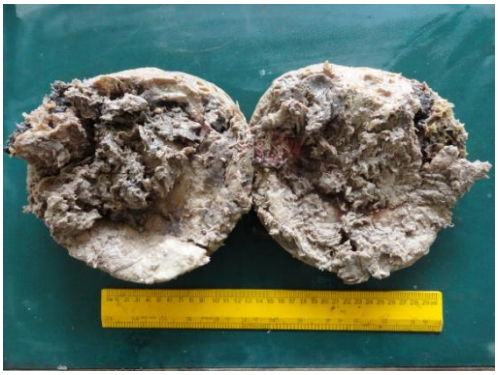
*MUCINOUS CYST ADENOCARCINOM, LOW POWER VIEW.*



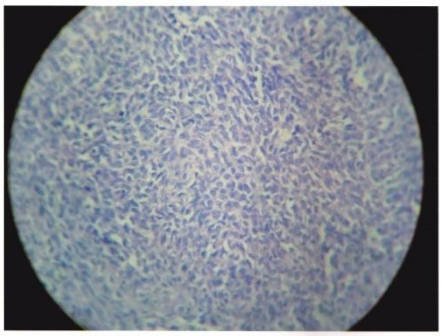
*PAS POSITIVITY IN MUCINOUS CYST ADENO CARCINOMA.*



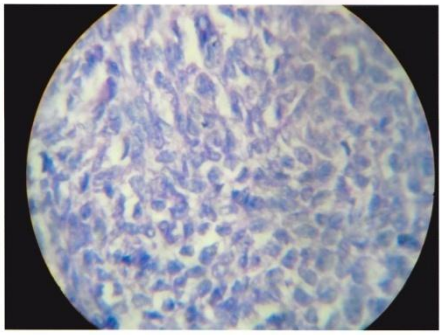
Microphotograph of Serous- Cyst Adenocarcinoma with Psammoma Bodies



Gross Picture of Granulosa Cell Tumour



*GRANULOSA CELL TUMOUR, LOW POWER VIEW.*



*GRANULOSA CELL TUMOUR, HIGH POWER VIEW.*

**DISCUSSION**

The ovarian tumour is diagnosed as benign, borderline or malignant depending on the presence of predominant cell type, pattern of growth, amount of fibrous stroma and cellular atypia with invasiveness [1]. Histologically, surface epithelial tumors are the commonest which is consistent with Mondal SK et al[].Out of 102 cases , 78.4% were diagnosed as benign, 20.6% malignant and 0.98 % cases as borderline ovarian tumour. Gupta *et al*. reported 72.9% benign, 4.1% borderline and 22.9% malignant tumors. [6] The major fraction of ovarian neoplasm in the study done by Mondal SK et al (2011) comprises benign tumors (63.1%), followed by malignant (29.6%) and borderline tumors (7.3%). In another study ,80.3% of the true ovarian neoplasms were benign while malignant ovarian tumours constituted 19.7%[Onviaorah IV et al 2011]. Germ cell tumor was the second major group of tumors in the present study (31/102). It comprised of benign cystic teratoma(27/31),Dysgerminoma (2/31) ,Yolk sac tumour (1/31) and one case of immature teratoma . Germ cell tumor was the second major group of tumors in the study (23.1%) Mondal SK et al []. However the germ cell tumours were the commonest ovarian neoplasm followed by surface epithelial tumours in most parts of Nigeria and Africa []. The proportion of mature teratoma was higher in this study, being the second most common benign tumor (after serous cystadenoma). Sex cord–stromal tumors, which comprise approximately 5% of all ovarian neoplasms, are tumors that differentiate in the direction of sex cords and/or the specialized ovarian stroma.[909] which is consistent with our finding on sex cord stromal tumour. Two cases of Krukenberg tumours were also detected in which primary tumour was in stomach. One case of MMMT also detected in this period.

**Sex Cord Stromal Tumours**-Of 102 ovarian tumour , 6 cases of sex cord stromal tumours were found which corresponds to 5.89%. Gault et al (1954) reported an incidence of 6.8%. Scully (1979) [9-11.] found 6%, Francisco [12] et al (1993) reported 4.09% and Sarkar[13] (1996) reported an incidence of 5.3% Robbins and Cotran (2010)[2] reported an incidence

of 3-5%. In the present study, the tumours showed a wide range from 16 to 58 years. The maximum incidence was between 40-50 years for granulosa cell tumours and 20-30 years for Sertoli-leydig cell tumours. In the present series, 4 cases of granulosa cell tumours were found which corresponds to 3.9% of the ovarian tumours. All were unilateral. Novak[14] and Woodruff (1979) opined that these tumours are almost always unilateral. Francisco [12]et al (1993) reported incidence of 1.17%, Mukherjee (1991) and Sarkar [13](1996) reported an incidence of 1.6% among all ovarian tumours. Clinically, patient with granulosa cell tumours showed evidence of endocrinological functioning in the form of menorrhagia and post menopausal bleeding. The smallest tumour weighed 100gm while the largest was 3000gm in weight. Two tumours were solid and two were purely cystic. Bhateja et al (1986) found three cases of complete cystic tumours in their studies. Microscopically, three tumours were1. arranged in follicular pattern and one tumour was arranged in diffuse pattern. Call-Exner bodies could be demonstrated in half of the cases. Simultaneous study of endometrium showed cystic hyperplasia in two cases.

Review of literature shows that large tumours, bilateral tumours and those that have ruptured and spread beyond the ovary have a less favourable prognosis (Bjorkholm and Silfersward, 1981). The degree of cytological atypia and mitotic activity also correlate with prognosis in some cases. Juvenile granulos cell tumours have a favourable prognosis despite the presence of cytologic atypia and mitotic activity (Zaloudek and Norris, 1982) Of a total of 102 ovarian tumours, two cases (1.96%) of Sertoli-Leydig cell tumours were found. They account for only 0.2% of all ovarian tumour (Ramachandran et al 1972), Sarkar [13](1996) reported an incidence of 0.5% Bajaj (2000)[5] reported an incidence of 0.5% of all ovarian tumours. Microscopically, one tumour showed diffuse sarcomatoid pattern with prominent atypia and mitotic activity. The other tumour showed sertoli cells arranged in tubules, nests and cords separated by stroma that contained clusters of Leydig cells. According to Novak and Woodruff [14](1979), thecomas may occur at any age. According to Claude, Gompel and Silver berg [15](1985), they are atleast twice as frequent as granulosa cells tumours. Francisco [12]et al (1993) reported 0.85% and Sarkar (1996) reported an incidence of 1.6%. However, no case was found in our series.

**CONCLUSION**

The main strength of this study is that it gives the most comprehensive picture of the current state of ovarian tumour incidence and histopathologic pattern . Surface epithelial tumours are the commonest followed by germ cell tumours.The incidence of common epithelial tumours is more than sex cord stromal tumours in this instituition.The incidence of Sex cord stromal tumours corresponded to the data available for the study. The major limitation of this study include the small sample size and short study period . However a tentative conclusion can be drawn from the present study that Ovarian tumours comprise one of the major neoplasms in female detected in this institution. Benign surface epithelial tumours are more common than malignant tumour.

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