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Study of histopathological spectrum of ovarian neoplasms: An experience at a tertiary care hospital

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Abstract
Background: In the present scenario**,** ovarian cancer is a leading cause of cancer incidence and mortality worldwide, proper categorization into exact morphological type will help the gynecologist for better diagnosis and management.
Aim & Objective: The present study has mainly investigated the incidence, morphological, gross, histopathological pattern, and incidence of the age distribution of ovarian tumors attending a tertiary care hospital.
Methodology: It is a prospective study carried out at Katuri Medical College and Hospital, Chinakondrupadu, Guntur district, Andhra Pradesh, India over a period of 2 yrs. i.e., from October 2017 to September 2019 in the department of Pathology. Sections were processed and stained with H&E, histomorphological patterns were noted. Wherever necessary, special stains such as PAS and Recticulin were used.
Results: In the present study, age range from 15 to 65 years with a majority of cases included, among 36-45 years, 26 (52 %) cases. In the total study population, Out of 50 ovarian tumors included, 76% (38/50) were benign, 10% (5/50) were borderline and 14% (7/50) were malignant. Surface epithelial tumors were most common about 76% (38/50 cases) followed by germ cell tumors 16% (8/50 cases) and Sex cord-stromal tumors 8% (4/50 cases). On gross examination, among 50 cases, cystic 64% (32/50 cases), solid 16% (8/50 cases), and both cystic and solid areas 20 %.
Conclusion: We conclude, ovarian cancer is the most predominant problem in the majority of women. The present study will provide valuable baseline information regarding the pattern of ovarian tumors in our region and also useful in proper management.

Keywords: Ovarian cancer, malignant, morphology, epithelial tumors, histopathology

Introduction
Ovaries are paired pelvic organs that lie on either side of the uterus close to the lateral pelvic wall, behind the broad ligament and anterior to the rectum [1]. Ovarian neoplasm is the most common tumor among women, fortunately, 90% are benign [2]. Ovarian cancer is the most frequent cause of death from gynecological cancers and the fourth most frequent cause of death from cancer in women in Europe, United States, and Eastern India [3, 4]. Main etiology behind ovarian tumors are risk factors are increasing age, positive family history, increasing age of reproduction, high socio-economic classes, nulliparity [5].
Depending on the type of the ovarian tissue where the neoplasm develops, ovarian tumors are classified into three primary classes: Epithelial tumors 76 %, germ cell tumors 16 %, and sex cord-stromal tumors 8 % [6, 7].
The aim of this study was to assess the incidence, morphological, gross, histopathological pattern, and incidence of the age distribution of ovarian tumors in view of WHO classification at a Katuri Medical College and Hospital.

Inclusion Criteria
Only Primary ovarian tumors were included in the present study.

Exclusion Criteria
Secondary ovarian tumors, other non-neoplastic ovarian lesions, inadequate specimens, and inappropriately fixed specimens were excluded from the present study.

Materials and Methods

After obtaining the Institutional ethical committee permission, retrospective and prospective study carried out at Katuri Medical College and Hospital, Chinakondrupadu, Guntur district, Andhra Pradesh, India over a period of 2 yrs. i.e., from October 2017 to September 2019 in the department of Pathology.

The samples included the specimens from the Department of Gynecology at our institute along with specimens from outside. Relevant clinical data and relative information were recorded from the biopsy records and statistical books.

The specimens received were allowed to fix in 10% buffered formalin for 24-48 h. Grossing done from solid and cystic areas. Sections were taken according to the guidelines given in Rosai[8]. Sections were processed and stained with H&E, histomorphological patterns were noted.

Wherever necessary, special stains such as PAS and Recticulin were used.

The histological characterization was done according to the WHO classification of 1995 [9].

Results and observation

Retrospective and prospective study was done from Oct 2017 to Sep2019 at Katuri Medical College Guntur. Specimens from 50 cases with ovarian tumors were processed in our laboratory.

Out of 50 ovarian tumors included, 76% (38/50) were benign, 10% (5/50) were borderline and 14% (7/50) were malignant (Table 1).

Surface epithelial tumors were most common about 76% (38/50 cases) followed by germ cell tumors 16% (8/50 cases) and Sex cord-stromal tumors 8% (4/50 cases) (Table 2).

Out of 38 cases of surface epithelial tumors, serous tumors comprised about 71% (27/38 cases) mucinous tumors about 21% (8/38) and Mixed seromucous tumors 8% (3/50 cases) (Table 3).

Germ cell tumors comprised about 16% (8/50) all of them are mature cystic teratomas except one case, mixed germ cell tumor.

Sex cord-stromal tumors comprised only 8% (4/50 cases) of all Ovarian tumors. In 4 cases of sex cord-stromal tumors, one is granulosa cell tumor, two were fibromas and another one was thecoma.

On gross examination, among 50 cases, cystic 64% (32/50 cases), solid 16% (8/50 cases), and both cystic and solid areas 20 % (10/50 cases) (Table 4).

Age range from 15 to 65 years with a majority of cases included, among 36-45 years, 26 (52 %) cases (Table 5). The youngest patient of our series was a female of 17 years with mature cystic teratoma, and the oldest patient was 62 years, a case of Papillary serous Cyst adenocarcinoma of the ovary.

Table 1: Distribution of ovarian tumors

Categories	Number of cases (Percentage)
Benign	38 (76%)
Borderline	5 (10%)
Malignant	7 (14%)
Total	50 (100%)

Table 2: Histopathological patterns of ovarian tumors

Histopathological type	Number of cases (Percentage)
Surface epithelial tumors	38 (76%)
Germ cell tumors	8 ((16%)
Sex cord-stromal tumors	4 (8%)
Total	50 (100%)

Table 3: Distribution of Surface epithelial tumors

Histopathological type of Surface epithelial tumors	Number of cases (Percentage)
Serous	27 (71%)
Mucinous	8 (21%)
Seromucinous	3 (8%)
Total	38(100%)

Table 4: Consistency of ovarian tumors

Consistency of ovarian tumor	Number of cases (Percentage)
Solid	8(16%)
Cystic	32 (64%)
Solid and cystic	10 (20%)
Total	50 (100%)

Table 5: Age-wise distribution of ovarian tumors

Age in years	Number of cases (Percentage)
15-25	3(6%)
26-35	10 (20%)
36-45	26 (52%)
46-55	6 (12%)
55-65	5 (10%)

Based on the site of involvement, the majority of the tumors were unilateral about 68% (34/50) with right side predominance, bilateral in 32 % (16/50).

Discussion

The ovary is a frequent site for both primary and metastatic tumors. Due to its complex structure, the neoplasms arising from the ovary inherit a wide spectrum of histogenesis, clinical behavior, and histological types.

The observations and analysis of the present study provide a fair insight into the histopathological pattern of primary ovarian tumors. The current study presents the data on 50 consecutive cases of ovarian neoplasms diagnosed in the Department of Pathology, at a tertiary care hospital over a period of 2 years (Oct 2017 to Sep 2019).

Out of 50 cases of ovarian neoplasms studied, 38cases i.e. 76% were labeled as benign, 5 cases i.e. 10% as borderline and 7 cases i.e. 14% as malignant. The present study is comparable with the studies mentioned in the below-given Table 6.

Table 6: Comparative studies of the frequency of benign, borderline and malignant ovarian tumors.

Comparison with other studies	Benign tumors (%)	Borderline (%)	Malignant tumors (%)	Total
Zubair Ahmad *et al.* [10]	506 (59.18%)	28(3.27%)	321(37.54%)	855
Vaddatti Tejeswini [11]	217(78.05%)	-	61(21.95%)	278
R Jha and Karki [13]	135(83.9%)	-	26(16.1%)	161
Nital *et al.* [15]	66(79.55%)	2(2.4%)	15(18.1%)	83
Present study	38 (76%)	5 (10%)	7 (14%)	50 (100%)

In the present study, surface epithelial tumors were most common (76%) followed by germ cell tumors (16%). These findings are similar to the studies done by Zubair Ahmad *et al*., Vaddatti Tejeswini, Panchal and Parikh, R Jha and Karki S, and Bhagyalakshmi A *et al.* (Table 7).

Table 7: Comparision of histopathological patterns of ovarian tumors with other studies

Histomorphological pattern	Ahmad *et al.* [10] (%)	Tejeswini1 [11] (%)	Panchal and Parikh [12] (%)	Jha *et al.* [13] (%)	Bhagyalakshmi *et al.* [14] (%)	The present study (%)
Surface epithelial tumors	543(63.50)	237(85.25)	39(46.9)	84(52.2)	214(80.2)	38(76%)
Germ cell tumors	232(27.13)	27(9.72)	38(45.7)	68(42.2)	38(14.2)	8(16%)
Sex cord-stromal tumors	50(5.84)	11(3.95)	3(3.6)	5(3.1)	11(4.1)	4(8%)

In the present study, cases were reported in the age group of 15-65 years. The majority was, among 36-45 years, 26 (52%) cases. In Panchal and Parikh study, age ranged from 10 to 86 years with a mean age of 39.1. Jha and Karki showed the majority of the ovarian tumors, among 31-40 years age group, 43 (26.7%) cases.

In our study, the majority of the ovarian tumors were unilateral about 68% (34/50) with right side predominance, bilateral in 32 % (16/50). Finding of the present study is comparable with the findings of Panchal and Parikh study which showed unilateral tumors in 78.3% (65cases) and bilateralism was seen in 22% (18 cases).

On gross examination, in the present study among 50 cases, cystic 64% (32/50 cases), solid 16% (8/50 cases), and both cystic and solid areas 20 % (10/50 cases).

In our study, the majority of the benign tumors were predominantly cystic inconsistency and malignant tumors were parly cystic and partly solid followed by solid in nature. These findings were similar to the findings of Pachori *et al*. [16] Pilli G [1].

Fig 1: Gross And H & E Stained Photomicrograph of Brenner Tumour (3192/19): Grossly it is a solid tumour with occasional mucinous areas. Microscopically there is a solid and cystic nest of urothelium – like cells surrounded by abundant dense stroma. Epithelial cells have sharp outlines and the cells are uniform, polygonal with pale cytoplasm, small but distinct nucleoli often with grooved nuclei.

Fig 2: Gross and H&E stained Photomicrograpgy of borderline Brenner tumour (3847/19)

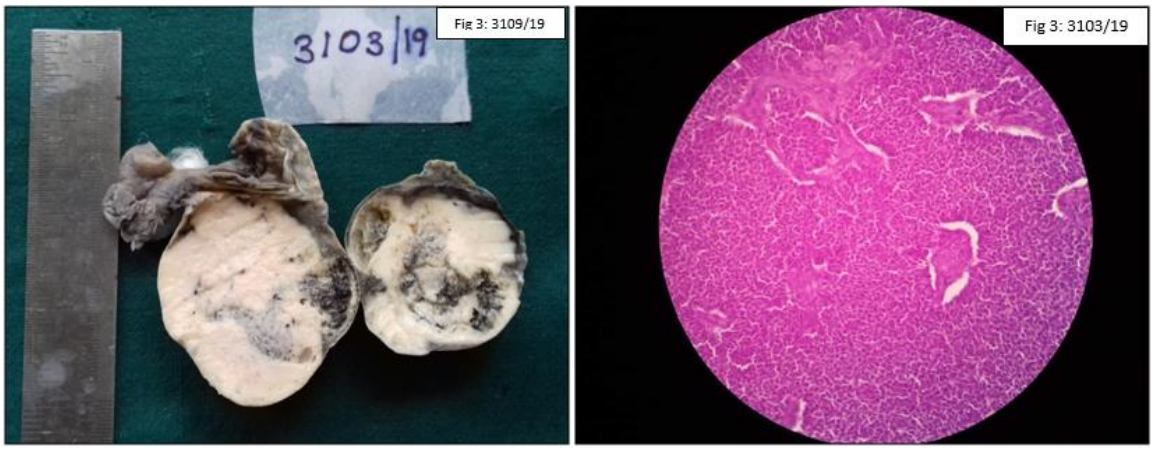

Fig 3: Gross And H & E Stained Photomicrograph of Adult Granulosa Cell Tumour (3103/19): Grossly, the sectioned surface is uniformly solid and yellow. Microscopically small, bland, cuboidal to polygonal cells forming Call-Exner bodies (small follicle-like structures filled with acidophilic material) and few cells with coffee bean nuclei.

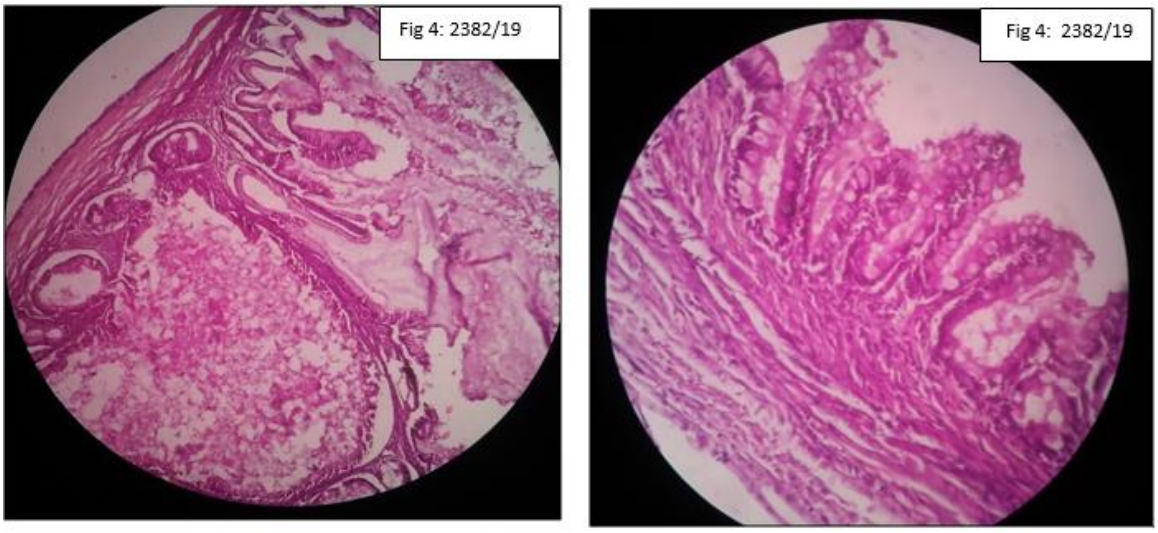

Fig 4: Gross And H & E Stained Photomicrograph of Benign Mucinouscystadenoma of Ovary (2382/19): Grossly sectioned surface reveals smooth surface with multiple cystic spaces that are filled with translucent viscous material. Microscopically cysts are lined by epithelium, part of which is lined by endocervical –like and part of which is of intestinal type with goblet cells.

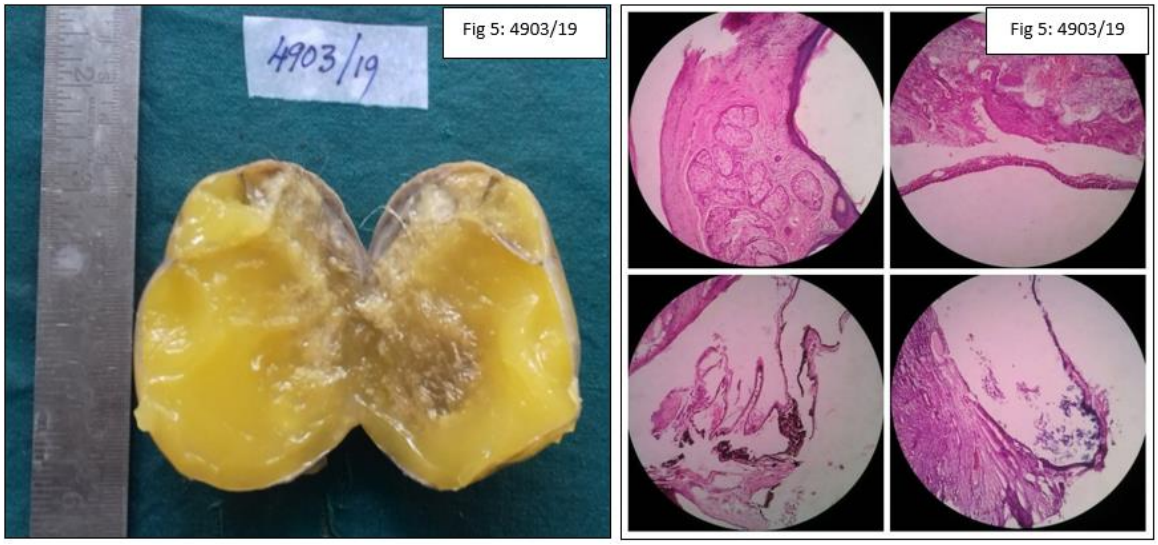

Fig 5: Gross And H & E Stained Photomicrograph of Benign Mature Cystic Teratoma of Ovary (4903/19): Grossly hemisected tumour mass is cystic in consistency, filled with yellowish greasy material along with pultaceous material, tuft of hair shaft and cartilage. Microscopically multiple sections from the ovarian mass shows various dermal elements.

Conclusion

In our study based on morphology, tumors arising from surface epithelium were most common followed by germ cell tumors. The majority of the tumors were reported among the age group of 35-45 years. The unilateral occurrence was more common than bilateral.

As ovarian cancer is a leading cause of cancer incidence and mortality worldwide, proper categorization into exact morphological types will help the gynecologist for better management. The observations and analysis of the present study will provide valuable baseline information regarding the pattern of ovarian tumors in our region.

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