

Surface Epithelial Tumours of the Ovary in a Rural Tertiary Care Hospital: A Retrospective Histopathological Study

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ABSTRACT

Introduction: Ovary is the second most common site of gynaecological malignancies in India. Ovarian neoplasms represent a heterogeneous group of tumours with diverse histomorphological patterns, biological behaviour, molecular alterations, and clinical outcomes. Surface epithelial tumors are the commonest of the ovarian tumors and constitute to 60% of all tumors and 90% of all ovarian malignancies. **Materials and Methods:** This study was conducted in the Department of Pathology, Sri Madhusudan Sai Institute of Medical Sciences and research, Muddenahalli, Chikkaballapur during the year 2024. **Results:** Among the 63 Ovarian tumors studied, 52 tumors composed of surface epithelial tumour. Majority were benign tumor (94.2%) with most of the tumors affecting the reproductive age group. **Conclusion:** Ovarian cancers exhibited diverse histomorphological patterns and mostly affected women of reproductive age. The results of the present study align with the majority of Indian and worldwide research.

Keywords: Ovarian tumours; Surface epithelial tumours; Histopathology; Serous cystadenoma; Mucinous cystadenoma; Retrospective study.

INTRODUCTION

Ovarian neoplasms represent a heterogeneous group of tumours with diverse histomorphological patterns, biological behaviour, molecular alterations, and clinical outcomes. They account for a significant proportion of gynaecological malignancies and pose diagnostic as well as therapeutic challenges due to their varied presentation and late-stage detection.¹ Globally, ovarian cancer ranks among the leading causes of cancer-related mortality in women. According to GLOBOCAN 2022 estimates, ovarian cancer accounts for more than 324,000 new cases annually, with an age-standardized incidence rate of 6.7 per 100,000 women.² In India, ovarian cancer is the third most common malignancy among women after carcinoma breast and carcinoma cervix, contributing substantially to cancer burden and mortality.³ The incidence has shown a rising trend, particularly in urban and semi-urban populations.⁴

Ovarian tumours are broadly classified by the World Health Organization into surface epithelial-stromal tumours, sex cord-stromal tumours, germ cell tumours, and metastatic tumours.⁵ Of these, surface epithelial tumours are by far the most common, comprising approximately 60% of all ovarian neoplasms and about 90% of ovarian malignancies.^{5,6} They are thought to arise from the ovarian surface epithelium, from inclusion cysts, or, as increasingly supported by recent evidence, from extra-ovarian sites such as the fimbrial end of the fallopian tube and endometriosis.^{7,8}

These tumours are histologically heterogeneous. They are classified into serous, mucinous, endometrioid, clear cell, transitional (Brenner), and seromucinous types, and each is further graded as benign, borderline (of low malignant potential), or malignant.⁵ This diversity is clinically significant, as the histological subtypes differ in their pathogenesis, molecular profile, clinical behaviour, response to chemotherapy, and prognosis.^{7,8}

The objective of this to study the histomorphologic spectrum of surface epithelial tumors of ovaries in a rural population.

METHODOLOGY

Study Design and Setting

This is a retrospective observational study conducted in the Department of Pathology at Sri Madhusudan Sai Institute of Medical Sciences and Research, a tertiary care teaching hospital catering to the Bangalore Rural population, Karnataka, India.

Study Period

The study was conducted over a period of 12 months (January 2024 to December 2024).

Sample Size

A total of 2068 gynaecological specimens were received during the study period, out of which 63 ovarian tumour specimens were identified and 52 of these ovarian tumours were reported under the category of surface epithelial tumours and were included in the study.

Inclusion Criteria

- All surgically resected ovarian specimens diagnosed as surface epithelial tumour (benign, borderline, or malignant).
- Specimens received as oophorectomy, salpingo-oophorectomy, or total abdominal hysterectomy with bilateral salpingo-oophorectomy.

Exclusion Criteria

- Non-neoplastic ovarian lesions, Germ cell tumours, Sex cord stromal tumour etc were excluded from the study.

- Inflammatory lesions without neoplastic pathology.

Data Collection

Relevant clinical and demographic data were obtained from patient records and requisition forms. The received specimen was grossed and sections taken, stained with Haematoxylin and Eosin (H&E). Tumours were classified according to the WHO Classification of Female Genital Tumours (2020 edition).

Statistical Analysis

Data were analysed using descriptive statistics. Categorical variables were expressed as frequencies and percentages.

Ethical Approval: The study was conducted in accordance with institutional ethical requirements. The authors should provide the Institutional Ethics Committee approval number and date or clarify whether ethical approval was waived.

RESULTS

A total of 2068 samples were received from the department of obstetrics and gynaecology during the study period. Out of which 63 ovarian tumour specimens were analysed in the present study. Out of the 63 ovarian tumours, 52 tumours were reported as Surface epithelial tumours. The age of patients ranged from 15 to 86 years. The majority of cases occurred in the 21–30 years age group (28.6%), followed by 31–40 years (19%).

Table 1: Age-wise distribution of Surface epithelial tumours of ovary (n = 52)

Age group (years)	Epithelial tumours	Percentage
11–20	7	13.5%
21–30	15	28.8%
31–40	9	17.3%
41–50	8	15.4%
51–60	5	9.6%
61–70	6	11.5%
>70	2	3.8%
Total	52	100%

Table 2: Distribution according to biological behaviour

Nature of tumours	Number (n)	Percentage
Benign	49	94.2%
Borderline	1	1.9%
Malignant	2	3.8%
Total	52	100%

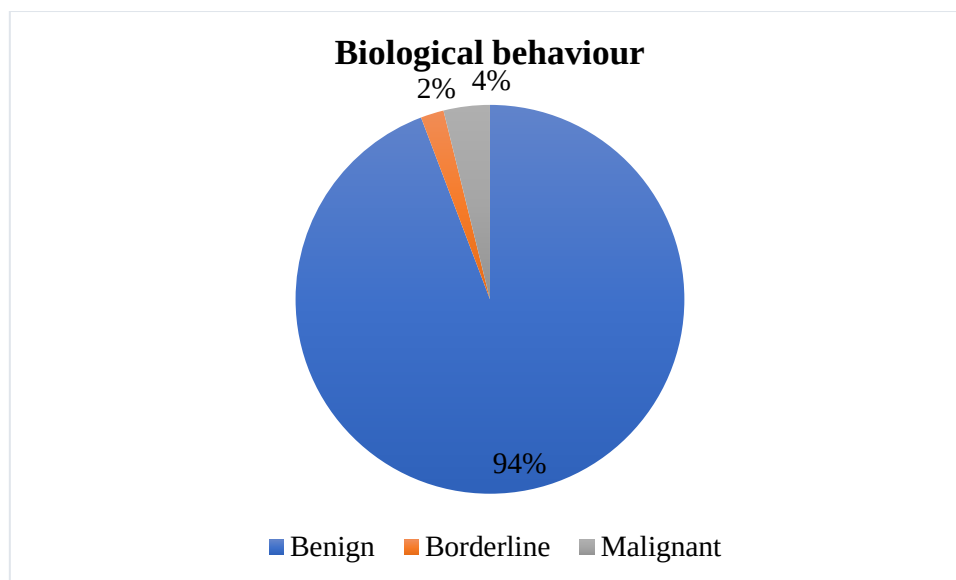


Table 3: Histological spectrum of Surface epithelial tumours of ovaries

Histological type	Number (n)	Percentage
Serous cystadenoma and variants	37	71.2%
Mucinous cystadenoma	11	21.2%
Brenner tumour	1	1.9%
Borderline mucinous tumours	1	1.9%
Clear cell carcinoma	1	1.9%
High-grade serous carcinoma	1	1.9%
Total	52	100%

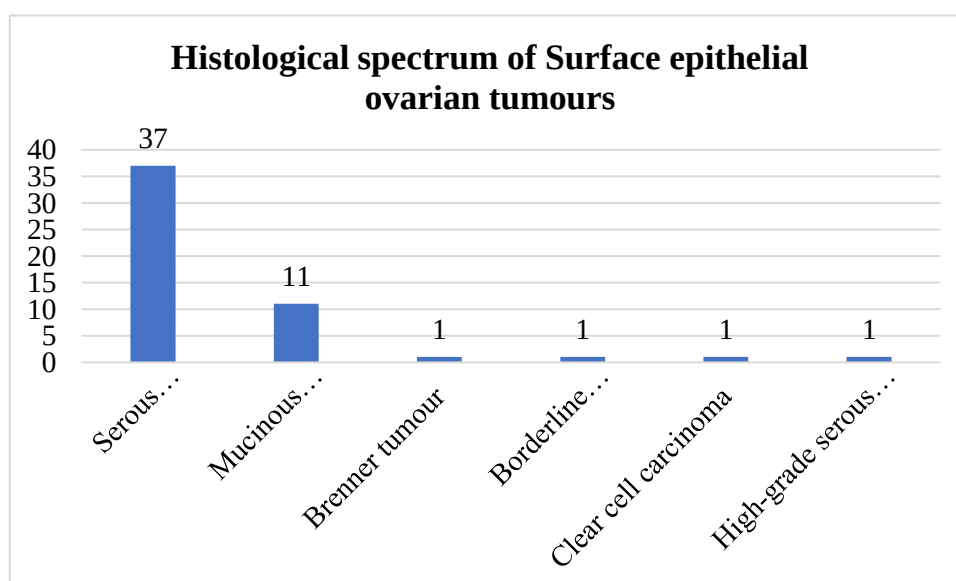


Table 4: Distribution of malignant tumours

Histological type	Number
Clear cell carcinoma	1
High-grade serous carcinoma	1
Total malignant tumours	2

A total of 52 surface epithelial ovarian tumours specimens received in the Department of Pathology during the study period were included in the present study. The tumours were analysed with respect to age distribution, biological behaviour, and histopathological spectrum.

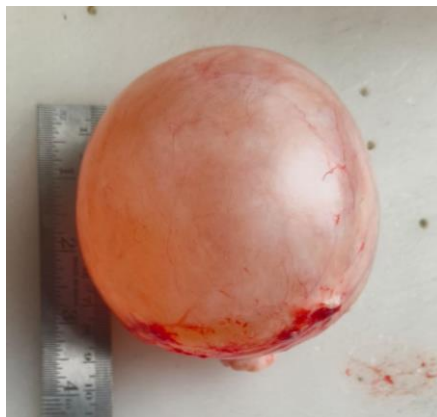
Age Distribution: The age of the patients ranged from 15 to 86 years. The majority of cases were observed in the 21–30 years age group (n = 15; 28.68%), followed by the 31–40 years age group (n = 9; 17.3%) and 41–50 years (n = 8; 15.4%). The least number of cases were seen in patients aged more than 70 years (n = 2; 3.8%).

Distribution According to Biological Behaviour: Based on histopathological evaluation, the majority of tumours were benign (n = 49; 94.2%), while borderline tumours accounted for 1 case (1.9%) and malignant tumours were identified in 2 cases (3.8%). The findings indicate that benign ovarian tumours formed the overwhelming majority of ovarian neoplasms in the present study.

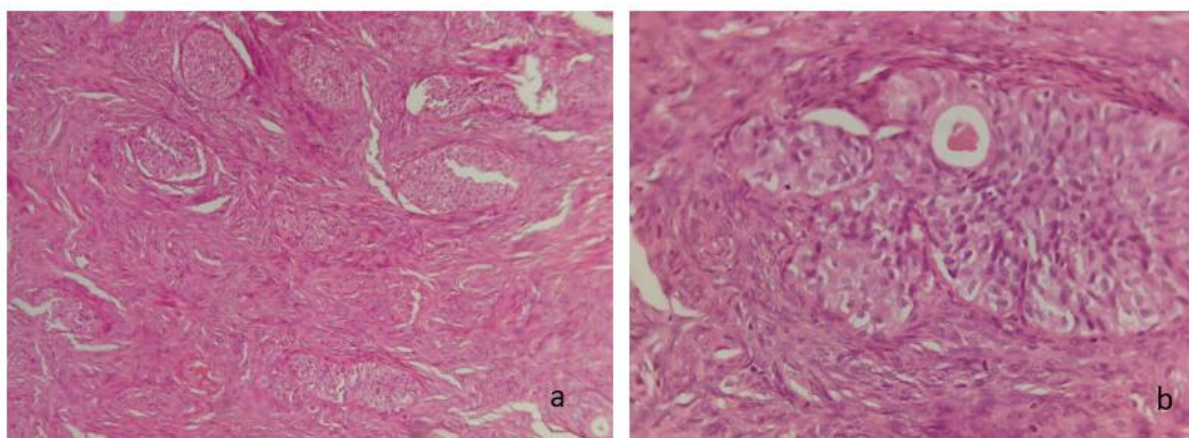
Histopathological Spectrum of Surface epithelial ovarian tumours: The most common surface epithelial tumours identified was serous cystadenoma, accounting for 37 cases (71.2%) of all surface epithelial tumours. This was followed by mucinous cystadenoma (n = 11; 21.2%). Less frequently encountered tumours include Brenner tumours (n = 1; 1.9%) and borderline mucinous tumours (n = 1; 1.9%).

Among the malignant tumours, clear cell carcinoma and high-grade serous carcinoma were observed, each accounting for one case (1.9%).

Overall, serous cystadenoma emerged as the most common surface epithelial ovarian tumour.



Picture1: Gross photograph of Serous cystadenoma showing smooth glistening outer surface.



Picture2: H&E Microphotograph of Benign Brenner's tumour showing Smooth contoured nests of bland transitional epithelium within fibromatous stroma. (a) Low power view (b) High power view

DISCUSSION

Ovarian tumours represent a heterogeneous group of neoplasms arising from surface epithelial cells, germ cells, and sex cord-stromal elements. Histopathological evaluation remains the gold standard for diagnosis and classification. The present study evaluated the histopathological spectrum of surface epithelial tumours in 52 cases and compared the findings with previously published Indian and international studies. Surface epithelial tumours are derived from the ovarian surface epithelium which develops from the coelomic epithelium (modified mesothelium) which lines the ovary. This epithelium penetrates the underlying mesenchyme to form müllerian duct. The

various histological types of ovarian surface epithelium tumours such as tubal type in serous neoplasms, endometrial type in endometrioid tumours and endocervical type in at least some mucinous neoplasms are attributed to this embryonic proximity.⁹ Epithelial ovarian tumours represent the most common type of ovarian tumor. Most of malignant cases represent high-grade serous, clear cell and endometrioid carcinomas; borderline serous and mucinous tumours of intestinal type are less common.¹⁹

Age Distribution: The age of patients ranged from 15 to 86 years with an average of 38.5 years. This finding was similar to Nalini Modepalli et al, where the age

distribution of 14-76years and average of 42.4years. In this study, the predominant occurrence of ovarian tumors was observed in the 21–30 age group, followed by the 31–40 age group. However in Nalini Modepalli et al¹⁰, the commonest age group was 40-49 years. Age is described as an independent prognostic factor in ovarian tumours.¹¹ Ovarian cancer rates increase exponentially with age.¹²

Distribution According to Biological Behaviour: The current investigation revealed that benign tumors

comprised 94.2% of cases, malignant tumors represented 3.8%, and borderline tumors composed 1.9%. Indian research has repeatedly indicated a prevalence of benign ovarian tumors. Gupta et al. reported benign tumors in 63.7% of patients, malignant tumors in 31.1%, and borderline tumors in 5.2%.¹³ Narang et al. similarly observed that benign tumors constitute roughly 70–80% of ovarian neoplasms.¹⁴

Table 5: Comparative analysis depicting the biological behaviour.

SL no	Study	Benign	Borderline	Malignant
01	Present	94.2%	1.9%	3.8%
02	Gupta et al ¹³	63.7%	5.2%	31.1%
03	Batool et al ¹⁵	79%	4.5%	15.8%
04	Kanasagara et al ¹⁶	86%	9.5%	4.5%

Histopathological Spectrum of Ovarian Tumors: In the current investigation, serous cystadenoma (71.2%) was identified as the predominant ovarian tumor. The results align with the data of Gupta et al., indicating that serous cystadenoma is the predominant benign epithelial tumor. Yogambal et al. and Prakash et al. also reported serous cystadenoma among the common benign ovarian tumours in their respective studies.^{17,18}

Strengths of the Study

The study describes the histopathological spectrum and biological behaviour of ovarian surface epithelial tumours in a rural tertiary care hospital. The inclusion of histopathologically confirmed cases and the classification of tumours according to their biological behaviour provide useful institutional data for comparison with other studies.

Limitations of the Study

The study was limited by its retrospective design, single-centre setting, and relatively small sample size. The findings may not be generalizable to the wider population. Further studies involving larger sample sizes and multiple centres are recommended.

Future Directions

Future multicentre studies involving larger sample sizes and longer study periods may help establish a broader understanding of the histopathological spectrum of ovarian surface epithelial tumours. Further research incorporating clinical presentation, tumour characteristics, and relevant follow-up data may also provide additional insights into their clinical behaviour.

CONCLUSION

Surface epithelial tumours form the largest group of ovarian neoplasms and show wide variation in histological type and behaviour. In this study of a rural population, benign tumours were the most common,

with serous tumours forming the bulk of the tumours. This pattern is broadly in line with those reported in other regional and national studies. Histopathological examination remains the cornerstone of diagnosis. It separates benign, borderline, and malignant lesions, and this directly guides the extent of surgery, the need for adjuvant therapy, and fertility-sparing decisions.

Declarations

Funding

No funding was required for the study

Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

All authors should specify their individual contributions to the study and manuscript preparation.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to institutional policies and applicable ethical restrictions.

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Use of Artificial Intelligence

The authors declare that no generative artificial intelligence tool was used to generate or interpret the scientific data, perform statistical analysis, or draw scientific conclusions presented in this manuscript.

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