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Histopathological Analysis Of Ovarian Tumours

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Abstract

Introduction and purpose of this study:-Ovarian cancer is the fifth most common malignancy among women worldwide and the most lethal gynecologic cancer due to its insidious onset and late diagnosis. In India, it accounts for nearly 25% of all malignant tumors of the female genital tract. Accurate histopathological classification and identification of molecular markers are critical for diagnosis, prognosis, and therapeutic planning.The purpose of this study is to evaluate the incidence, distribution, histopathological features, and grading of ovarian tumors. It aims to correlate clinicopathological parameters and compare findings with previous studies to explore prognostic and therapeutic significance.

Methodology:-This prospective cross-sectional study was conducted in the Department of Pathology, JLN Medical College, Ajmer, from January 2023 to June 2024. A total of 135 ovarian tumor specimens were analyzed. Gross and microscopic features were assessed using hematoxylin and eosin staining.

Results: -Of the 135 ovarian tumors, 112 (82.2%) were benign and 23 (17.8%) malignant. Serous cystadenocarcinoma was the most common malignancy (52.2%), followed by mucinous carcinoma (21.7%). The majority of patients were aged 21–40 years (47.4%), with a mean age of 40.5 years. Clinical complaints most frequently included abdominal pain (94.8%) and mass (86.6%).

Conclusion: - The study confirms epithelial tumors,particularly serous tumors is the predominant ovarian neoplasms with benign lesions predominating.Accurate histopathological evalution and early diagnosis remain essential for appropriate management and improved patient outcomes.

Keywords: NIL

Introduction

Ovarian tumours comprise a heterogeneous group of neoplasms arising from the surface epithelial cells, germ cells, or sex cord–stromal elements of the ovary. They represent one of the most important causes of morbidity and mortality among women because ovarian cancer is frequently diagnosed at an advanced stage. Ovarian cancer is the fifth most common malignancy in women worldwide and the second most common gynecological cancer, accounting for more than 313,000 new cases and over 207,000 deaths annually.[1-3] The incidence is highest in developed countries, whereas lower rates are reported in Asia and Africa.[4] In India, ovarian cancer has a particularly poor prognosis because patients often present late due to vague and nonspecific symptoms and the absence of an effective screening programme.[5–7]

The majority of ovarian tumours are benign and occur during the reproductive age group, while malignant epithelial tumours predominate after the age of 45

years.[8] [9] The WHO 2020 classification categorizes ovarian tumours into epithelial, germ cell, sex cord–stromal and miscellaneous tumours based on histogenesis and molecular characteristics.[10] Accurate histopathological classification is essential because tumour subtype, grade and stage determine prognosis, treatment and patient survival.[11]

The pathogenesis of ovarian cancer is multifactorial. Germline mutations in BRCA1 and BRCA2 genes and Lynch syndrome are well-established genetic risk factors, while repeated ovulation, increasing age, infertility and family history also contribute to disease development.[12] Conversely, multiparity, breastfeeding and prolonged oral contraceptive use reduce the lifetime risk by suppressing ovulation.[13]

Clinically, early ovarian cancer is usually asymptomatic or presents with nonspecific complaints such as abdominal bloating, pelvic pain, early satiety, abdominal distension and urinary frequency. Advanced disease may present with ascites, bowel obstruction, pleural effusion or distant metastasis.[14] Diagnosis requires a combination of clinical examination, imaging, serum tumour markers such as CA-125, and definitive histopathological examination with immunohistochemistry whenever required.[15]

Recent advances in molecular pathology have transformed the understanding of ovarian tumours. Molecular classification, identification of BRCA mutations and homologous recombination deficiency, together with targeted therapies such as PARP inhibitors, have improved patient management and survival.[16] A thorough understanding of the epidemiology, classification, risk factors and pathological features of ovarian tumours is therefore essential for accurate diagnosis, prognostic assessment and optimal therapeutic planning. Bibliography

Aims And Objectives

1. To evaluate the incidence and distribution of different histopathological subtypes of ovarian tumours.

2. To analyse age, stage and grade of ovarian tumour.

3. To study the histopathological feature and frequency of ovarian tumour.

4. To compare the findings of our studies with other similar studies.

Material And Methods

This Prospective study (Cross sectional study) was conducted at Department of Pathology, Jawaharlal Nehru Medical College and Associated Group of Hospitals, Ajmer (Rajasthan) from January 2023 to June 2024. Permission of the institutional ethical committee was taken for conducting this study.**Inclusion Criteria:**All resected ovarian specimens received Department of Pathology, JLN Medical College.**Exclusion Criteria:**Small biopsies,Specimen not well fixed in formalin.**Methodology:**Patient age, gender, registration number, histopathology number, type of surgery of the resected specimen and its gross features were noted from the requisition form. All surgical pathology specimens were processed and sections examined after staining with conventional Haematoxylin and eosin(H &E)staining and special stains were done wherever indicated.

Observation And Results

Table.1 Distribution of cases according to nature of tumor

Age group	Benign	Malignant	Total
<20	8	0	8
21-40	56	8	64
41-60	40	11	51
>60	8	4	12

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Total	112	23	135

Benign tumors (82.2%) were more prevalent across all age groups, whereas malignant cases (17.8%) were mostly seen in the 41-60 years age group. No malignancies were found in patients below 20 years.

Table 2. Distribution of cases according to parity of patient

Parity	No. of cases	Percentage
Nulliparous	39	29.1
Multiparous	96	70.9

A significant proportion of cases (70.9%) were multiparous, while 29.1% were nulliparous. This could indicate a potential correlation between parity and ovarian pathology, possibly due to hormonal influences

Table 3. Distribution of cases according to presenting complaints

Complaints	No. of cases	Percentage
Pain	127	94.8
Mass	116	86.6
Irregular menses	66	49.3
Abdomen distension	58	43.3
Infertility	30	22.4
Weight loss	23	17.2
Edema	15	11.2
Ascites	15	11.2

Pain (94.8%) and mass (86.6%) were the most common symptoms, followed by irregular menses, abdominal distension, and infertility. The presence of weight loss, edema, and ascites in some cases suggests potential malignancy or advanced disease.

Table 4. Distribution of cases based on gross appearance

Tumor type	Serous	Mucinous	Cystic	Solid	Mixed	Total
Epithelial Tumor	67	15	8	2	0	92
Germ Cell Tumor	0	0	12	6	8	26
Sex Cord-Stromal Tumor	0	0	2	3	4	9

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Tumor-like Lesion	2	0	5	1	0	8
Total	69	15	27	12	12	135

Epithelial tumors were predominantly serous (69 cases), while germ cell tumors were mostly cystic (12 cases).

Table 5. Distribution of cases according to morphological types

Age groups	Epithelial Tumor	Germ Cell Tumor	Sex Cord-Stromal Tumor	Tumorlike Lesion	Grand Total
<20	6	2	0	0	8
21-40	47	14	3	0	64
41-60	38	8	4	1	51
>60	1	2	2	7	12
Total	92	26	9	8	135

Epithelial tumors were the most common across all age groups, followed by germ cell tumors, which were more frequent in younger patients (21-40 years).

Sex cord-stromal tumors and tumor-like lesions were rare.

Table 6. Distribution of cases according to different morphological subtypes ofbenign tumor of ovary

Type of tumor	Number of patients	Percentage
Serous Cystadenoma	51	45.53
Serous Cystadenofibroma	3	2.68
Mucinous Cystadenoma	15	13.39
Borderline Papillary Serous Cystadenoma	2	1.78
Borderline Proliferative Mucinous Tumor	1	0.89
Fibroma(Sex Cord Stromal Tumor)	8	7.14

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Mature CysticTeratoma	25	22.32
Serous Cyst	2	1.78
Mucinous Cyst	1	0.89
Follicular Cyst	4	3.57
TOTAL	**112**	**100**

Serous cystadenoma (45.53%)was the most frequently observed benign tumor, followed by mature cystic teratoma and mucinous cystadenoma.

Table 7. Distribution of cases according to different morphological subtypesmalignant tumor of ovary

Type of tumor	Cases	Percentage
Serous CystadenoCarcinoma	12	52.17
Mucinous Carcinoma	5	21.74
Endometroid Carcinoma	2	8.69
Clear cell carcinoma	1	4.4
Dysgerminoma	1	4.4
Sex cord stromal tumor	1	4.4
Modrately Diffrentiated SCC	1	4.4
Total	**23**	100

Serous cystadenocarcinoma (52.17%) was the most common malignant tumor, followed by mucinous carcinoma and other variants. Rare malignancies such as dysgerminoma and endometrioid carcinoma were also identified.

IMAGES

FIGURE 5:H&E stained microscopic view of benign serous cystadenoma showing single layer of ciliated columnar epithelium. (400 X view)

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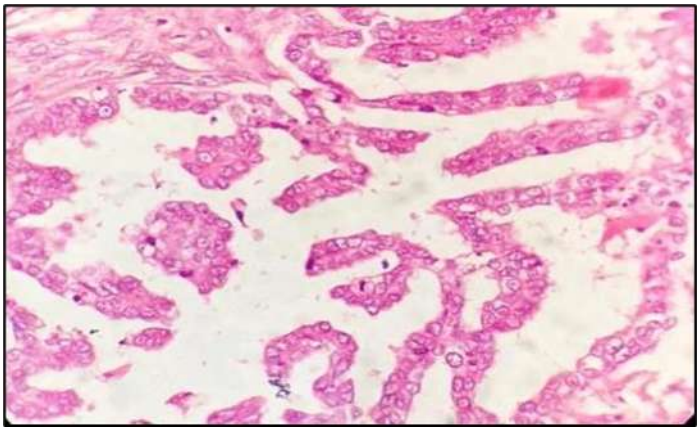

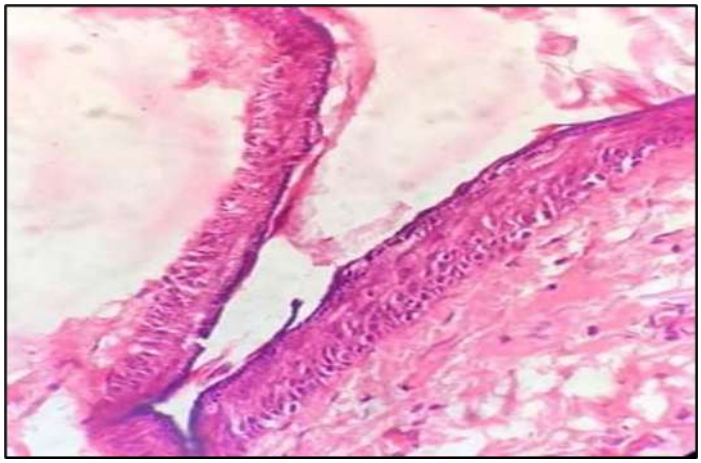

Disscussion

The present study evaluated the clinicopathological spectrum of ovarian tumors. A total of 135 ovarian tumor cases were analyzed with respect to age, parity, clinical presentation, gross morphology, histopathological subtype, and HER2/neu status. The findings were compared with previously published national and international studies to identify similarities and regional variations.

The majority of ovarian tumors occurred in women aged 21–40 years, followed by those aged 41–60 years, with a mean age of 40.5 years. Benign tumors were more common in younger women, whereas malignant tumors predominated in patients above 40 years. This trend supports the established observation that the risk of epithelial ovarian malignancy increases with age.

Most patients were multiparous, while a smaller proportion were nulliparous. No statistically significant association was observed between parity and tumor behavior. Although nulliparity has traditionally been regarded as a risk factor for epithelial ovarian carcinoma, the present findings suggest that genetic, hormonal, and environmental influences may contribute more substantially to tumor development.

Abdominal pain and abdominal mass were the most frequent presenting complaints. Other symptoms included abdominal distension, menstrual irregularities, infertility, ascites, edema, and weight loss. Features such as ascites, edema, abdominal distension, and unexplained weight loss were significantly associated with malignant tumors, emphasizing the need for early evaluation of persistent abdominal symptoms.

Benign tumors constituted the majority of cases, while malignant tumors represented a smaller but clinically significant proportion. Epithelial tumors were the most common histological category, followed by germ cell tumors, sex cord-stromal tumors, and tumor-like lesions. Serous tumors predominated among epithelial neoplasms, with serous cystadenoma being the commonest benign lesion and serous cystadenocarcinoma the most frequent malignant subtype. These observations are consistant with published literature.

Gross examination demonstrated predominantly cystic serous and mucinous epithelial tumors, whereas germ cell tumors were largely cystic and sex cord-stromal tumors were mainly solid or mixed. Such morphological patterns remain useful for radiological correlation and intraoperative assessment.

Overall, this study confirms that epithelial ovarian tumors are the predominant ovarian neoplasms and that serous tumors account for the majority of both benign and malignant lesions. Recognition of warning symptoms and careful histopathological evaluation are essential for early diagnosis and appropriate management

Summary & Conclusion

This prospective hospital-based study, conducted in the Department of Pathology, Jawaharlal Nehru Medical College, Ajmer, evaluated 135 histopathologically confirmed ovarian tumors over one year to analyze their histomorphological spectrum. Benign tumors were the most common,

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followed by malignant and borderline lesions. Surface epithelial tumors represented the largest histological group, with serous tumors being the predominant subtype. Malignant tumors occurred more frequently in older women and were commonly associated with advanced clinical stage and higher histological grade. Histopathological examination remains the gold standard for diagnosis and classification of ovarian tumors, while immunohistochemical evaluation provides valuable prognostic information. Early detection, accurate pathological diagnosis, and identification of molecular markers can improve patient stratification and guide individualized treatment. Larger multicenter studies with long-term follow-up are recommended to further validate the prognostic and therapeutic significance of HER-2/neu expression in ovarian carcinoma. Such integrated evaluation may ultimately contribute to better survival outcomes and optimized management strategies for affected women worldwide.

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