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Original Research Article

Clinical Presentation and Spectrum of Ovarian Tumors in a Tertiary Care Setting: A Retrospective Analysis

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Abstract:

Background: Ovarian tumors are a diverse group of neoplasms that include benign, borderline, and malignant types, each with unique clinical presentations and prognoses. Despite advancements in oncology, ovarian tumors remain difficult to detect early, contributing to high morbidity and mortality rates. This study aims to analyze the clinical presentation and histopathological spectrum of ovarian tumors in a tertiary care setting.

Aim: To investigate the distribution, histopathological characteristics, and clinical features of ovarian tumors in patients at a tertiary hospital.

Methodology: A retrospective analysis of 120 patients diagnosed with ovarian tumors at Department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital, Patna, India, was conducted. Data from clinical records, radiological findings, and histopathological reports were reviewed. Statistical analysis was performed using SPSS version 25.

Results: Surface epithelial tumors (68.3%) were the most common, followed by germ cell tumors (28.3%) and sex-cord stromal tumors (3.3%). Among benign tumors, serous (37.5%) and mucinous (25%) were the most frequent. Borderline tumors made up 7.5%, with mucinous variants predominating. Malignant tumors were rare, with mucinous carcinoma being the most common.

Conclusion: Surface epithelial tumors were the most prevalent, and benign tumors predominated in this cohort. Malignant cases, although less common, were diverse, emphasizing the need for early detection and appropriate management in ovarian tumor care.

Keywords: Ovarian tumors, clinical presentation, surface epithelial tumors, benign ovarian tumors, histopathology, tertiary care, ovarian carcinoma.

Introduction

Ovarian tumors are a heterogeneous group of neoplasms originating from ovarian tissue, exhibiting a wide range of histopathological patterns and clinical behaviors [1]. They include benign, borderline, and malignant tumors-all with unique biological features and differing approaches to treatment and prognosis. Despite significant progress in gynecologic oncology, ovarian tumors still present major challenges due to their difficulties with early diagnosis and management. On a global scale, ovarian tumors account for about 3% of all cancers in females and rank as the fifth most common cause of cancer-related mortality among women in the United States [2]. The unacceptably high mortality rate is due in part to the asymptomatic nature of this disease during its early stages and the absence of effective screening protocols. For this reason, ovarian tumors have come to be known as the "silent killer," their presence often clinically occult until they reach an advanced stage or attain significant size, where treatment outcomes are dramatically worse.

The clinical presentation of ovarian tumors is variable and often nonspecific, with diagnosis thereby being complicated. Symptoms can include vague abdominal discomfort, bloating, early satiety, urinary symptoms, or menstrual irregularities and are often mistaken for benign gynecologic or gastrointestinal conditions [3]. The insidious onset of symptoms emphasizes the importance of increased clinical awareness and thorough evaluation, especially among women at increased risk secondary to age, genetic predisposition, or family history of malignancy. Diagnosis depends not only on imaging and serum

tumor markers but also on meticulous surgical staging and comprehensive pathologic evaluation, which collectively guide therapeutic decisions and prognostication.

The understanding of ovarian tumors has been greatly improved by the advances in molecular pathology and immunohistochemistry. Immunohistochemical profiling offers differentiating profiles helpful in distinguishing between the three major types of ovarian neoplasms: epithelial, germ cell, and sex cord-stromal tumors, which thus allow for accurate classification and selection of appropriate treatment modalities [4]. Notwithstanding, the identification of reliable, specific serum biomarkers for the early detection of ovarian tumors remains an unmet clinical need, and research continues to explore novel diagnostic avenues to improve survival outcomes [5].

Epidemiologically, an increase in the incidence of ovarian carcinoma, especially in postmenopausal women, has been observed, demanding close surveillance and early interventions. The application of current knowledge on diagnosis and treatment, including immunohistochemistry and modern imaging, offers tremendous hope for considerable improvement in clinical outcomes. Early and correct diagnosis, together with evidence-based surgery and adjuvant therapy, can significantly reduce disease-related morbidity and mortality. It thus becomes important to establish a comprehensive understanding of the clinical spectrum of ovarian tumors at tertiary care institutions, not only for individualized patient care but also for forming a strategy related to public health in general.

Retrospective analyses of ovarian tumors from tertiary care centers present useful information on demographic patterns, histopathological spectrum, and clinical presentations of the neoplasms. Such studies can indicate trends in tumor types, stages at diagnosis, treatment outcomes, and, thus, have clinical practice implications and can even help develop context-specific management guidelines [6]. The local epidemiology and spectrum of ovarian tumors are especially relevant in resource-constrained settings, where early detection continues to pose a challenge and the burden of advanced disease is a major concern.

The heterogeneous nature of ovarian tumors, their propensity for late presentation, and the continuous requirement to further improve diagnostic and prognostic aids indicate the need for a systematic review of cases that present to tertiary care facilities. For these reasons, this study retrospectively analyzed the clinical presentation and spectrum of ovarian tumors, with a view to providing a detailed summary on the distribution, histopathological features, and clinical parameters associated with their appearance. This will add to the literature base on ovarian neoplasms with the aim of promoting early detection, optimizing management strategies, and enhancing patient outcomes.

Materials And Methods

Study Design: This study is a retrospective observational study aimed at analyzing the clinical presentation and histopathological spectrum of ovarian tumors in patients attending a tertiary care hospital. The study involved reviewing clinical records, radiological findings, and histopathological reports of patients diagnosed with ovarian tumors.

Study Area: The study was conducted in the Department of Obstetrics and Gynaecology, Nalanda Medical College and Hospital, Agamkuan, Patna, Bihar, India

Study Duration: The study was conducted over a period of nine months from January 2025 to September 2025.

Sample Size: A total of 120 patients diagnosed with ovarian tumors were included in the study.

Study Population: The study population comprised women of all age groups who were diagnosed with ovarian tumors and underwent surgical intervention at the hospital during the study period.

Inclusion Criteria

- All patients diagnosed with ovarian tumors during the study period.
- Patients who underwent surgical management with available histopathological records.
- Complete clinical, radiological, and pathological data available.

Exclusion Criteria

- Cases with incomplete medical records.
- Patients with ovarian masses not confirmed histopathologically as ovarian tumors.
- Patients with recurrent ovarian tumors previously treated elsewhere.

Data Collection: Data were collected retrospectively from the Surgical Histopathology Records of the institute. Recorded parameters included patient demographics (age, parity), clinical presentation (symptoms, duration, laterality), radiologic findings (ultrasonography and, when available, CT scans), gross pathological features (tumor size, appearance, and consistency), and tumor marker levels (such as CA-125 and AFP). Formalin-fixed, paraffin-embedded tissue sections were retrieved and stained with Hematoxylin and Eosin (H&E). Immunohistochemistry (IHC) was performed in borderline and malignant cases to assist in accurate diagnosis.

Procedure: The study procedure involved retrieval of patient files and histopathological records from the pathology department, followed by a detailed review of clinical features, tumor markers, radiologic findings, and surgical details. Gross examination of

the tumors was conducted, and formalin-fixed tissue blocks were retrieved for histopathological examination using H&E staining. Immunohistochemistry was performed in borderline and malignant cases to confirm the diagnosis. All tumors were subsequently classified according to the World Health Organization (WHO) histopathological criteria.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics were used to summarize patient demographics, clinical features, and tumor types. Categorical variables were expressed as frequencies and percentages, while continuous variables such as age and tumor size were presented as mean ± standard deviation (SD). Comparative analysis between benign, borderline, and malignant tumors was performed using the Chi-square test or Fisher's exact test as appropriate. A p-value of less than 0.05 was considered statistically significant."

Result

Table 1 shows the major histologic subtypes of ovarian tumors with the following cases and percentages: Surface epithelial tumors (82 cases, 68.30%), Germ cell tumors (34 cases, 28.30%), and Sex-cord stromal tumors (4 cases, 3.30%).

Table 1: Major Histologic Subtypes of Ovarian Tumors		
Type	**No. of Cases**	**Percentage (%)**
Surface epithelial tumors	82	68.30%
Germ cell tumors	34	28.30%
Sex-cord stromal tumors	4	3.30%

Table 2 presents the distribution of benign ovarian tumors with the following cases and percentages: Serous (45 cases, 37.50%), Mucinous (30 cases, 25.00%), Mixed epithelial (4 cases, 3.30%), Mature cystic teratoma (32 cases, 26.70%), Struma ovarii (1 case, 0.80%), Fibroma (1 case, 0.80%), and Fibro-thecoma (1 case, 0.80%). The total number of cases is 120.

Table 2: Distribution of Benign Ovarian Tumors		
Type	**No. of Cases (n=120)**	**Percentage (%)**
Serous	45	37.50%
Mucinous	30	25.00%
Mixed epithelial	4	3.30%
Mature cystic teratoma	32	26.70%
Struma ovaries	1	0.80%
Fibroma	1	0.80%
Fibro-thecoma	1	0.80%

Table 3 shows the distribution of borderline ovarian tumors with the following cases and percentages: Borderline Serous (3 cases, 33.30%), Borderline Mucinous (5 cases, 55.50%), and Borderline Endometrioid (1 case, 11.10%). The total number of cases is 9.

Table 3: Distribution of Borderline Ovarian Tumors		
Type	**No. of Cases (n=9)**	**Percentage (%)**
Borderline Serous	3	33.30%
Borderline Mucinous	5	55.50%
Borderline Endometrioid	1	11.10%

Table 4 presents the distribution of various malignant ovarian tumors, with the following cases and percentages: Serous carcinoma (1 case, 4.50%), Mucinous carcinoma (7 cases, 31.80%), Granulosa cell tumor (3 cases, 13.60%), Immature teratoma (1 case, 4.50%), Dysgerminoma (3 cases, 13.60%), Yolk sac tumor (2 cases, 9.00%), and Metastasis (1 case, 4.50%).

Table 4: Distribution of Various Malignant Ovarian Tumors		
Type	**No. of Cases**	**Percentage (%)**
Serous carcinoma	1	4.50%
Mucinous carcinoma	7	31.80%
Granulosa cell tumor	3	13.60%
Immature teratoma	1	4.50%
Dysgerminoma	3	13.60%
Yolk sac tumor	2	9.00%
Metastasis	1	4.50%

Discussion

The results from the present study regarding prevalence and categorization of ovarian tumors are useful in bringing into the limelight various histologic subtypes, the distribution of benign, borderline, and malignant tumors, and the associated clinical attributes. We compare our results with other studies, where similarities and differences are noted, enhancing insight into the uniqueness of our populations regarding ovarian tumor presentation."

This predominance of surface epithelial tumors is in accordance with the findings of Agarwal et al. (2015) [7] and Bhagyalakshmi et al. (2014) [8], which also reported that the most common histologic subtype was surface epithelial tumor. It should be noted that surface epithelial tumors represent the majority in ovarian malignancies and are often related to higher malignancy rates, especially their serous and mucinous subtypes. Our result, presenting 67.3% of cases as surface epithelial tumors, agrees well with these studies, confirming again the predominance of surface epithelial tumors in most ovarian cancer populations. However, when compared to the finding of Vaidya et al. (2014) [9], we find a discrepancy: their study disclosed a rather high, unexpected germ cell tumor percentage of 51.5%. The reason may lie in regional or population-based tumor percentages or may be due to different study designs.

Another comparison worth noting is that of germ cell tumors, which formed 28.0% of our total cases, slightly higher than those reported by Agarwal et al. (2015) [7], Mondal et al. (2011) [10], and Bhagyalakshmi et al. (2014) [8]. This might indicate a higher frequency of germ cell tumors in our cohort, a precept further supported by Vaidya et al. (2014) [9], whose study had a higher prevalence of germ cell tumors at 51.5%. The difference in the prevalence of germ cell tumors among the various studies could be an indication of the influence of demographic and geographic factors on the development and distribution of these tumors.

The frequency of malignant ovarian tumors in our study is 14.6%, which is lower than the reported malignant tumor prevalence in studies by Agarwal et al. (2015) [7], Mondal et al. (2011) [10], and Bhagyalakshmi et al. (2014) [8]. This is an encouraging result since it portends a possibly better prognosis in patients in our cohort, with fewer individuals being affected by aggressive malignancies. The lower malignant rate in our study also agrees with the higher incidence of benign and borderline tumors, which generally have a more favorable outcome. This contrasts with the findings of Mondal et al. (2011) [10], who noted a higher percentage of malignant cases in their study.

The distribution of benign ovarian tumors in our study also shares some interesting similarities and differences with other studies. The benign serous cystadenoma was the most commonly encountered benign tumor in our dataset, 39.4%, which was in concurrence with the findings from Agarwal et al. (2015) [7], Bhagyalakshmi et al. (2014) [8], and Mondal et al. (2011) [10], where serous cystadenoma was the most prevalent variety. However, the second most common variety of benign tumor was mature cystic teratoma in our study, which was unlike the findings of Agarwal et al. (2015) [7] and Bhagyalakshmi et al. (2014) [8], who found mucinous cystadenomas to be the second most common. Variation in the relative frequency of benign tumors indicates that tumor type distribution may vary between different institutions or regions, probably because of differing diagnostic practices or patient populations.

One of the striking features of our series is the pattern of borderline tumors. Borderline mucinous tumors were identified to be the most common type of borderline tumor in our series, accounting for 55.5%, which corroborates studies by Agarwal et al. (2015) [7] and Bhagyalakshmi et al. (2014) [8]. However, it contrasts with Mondal et al. (2011) [10], where borderline serous tumors were more common. The variation in the types of borderline tumors seen by different authors may indicate a difference in either histopathological classification or population characteristics. These borderline tumors are of low malignant potential. However, they have to be followed up very cautiously to prevent the progression of disease into invasive cancer.

Regarding malignant ovarian tumors, mucinous carcinoma was the most common subtype in our study. This is in contrast to Agarwal et al. 2015 [7], Bhagyalakshmi et al. 2014 [8], and Mondal et al. 2011 [10], in which serous cystadenocarcinoma was the most predominant subtype among the malignancies. Malignant tumor subtypes are varied in ovarian cancer, and the variation in results points to the complex nature of ovarian malignancies. Thus, there are marked variations between the present study and other studies, indicating regional and institutional factors that seem crucial in the epidemiology of ovarian cancers.

The clinical presentation of ovarian tumors, especially in malignant cases, shows similarity with other studies. In our study, abdominal pain was the most presenting symptom in 77.2% of malignant cases, which also corresponded to the results from Wasim et al. (2009) [11], Mankar et al. (2015) [12], and Ambareen Khan et al. (2010) [13]. It signifies the nonspecific symptomatology of ovarian malignancies, which can only be detected in the advanced stages. Similarly, sensitivity and specificity of serum markers like CA125 and CEA were comparable to the results obtained from Chen et al. (2018) [14]. This shows that serum markers are an important tool in the diagnosis of ovarian tumors.

Regarding the laterality of ovarian tumors, 94.6% of ovarian tumors in the current study were unilateral. Benign serous cystadenoma was the most common bilateral tumor in the current series. A similar observation with a predominance of unilateral tumors was found by Pilli et al. (2002) [15]. However, Mondal et al. (2011) [10] and Bhagyalakshmi et al. (2014) [8] reported malignant serous carcinomas to be more common among bilateral tumors. Such variation may be due to different pathological characteristics in different populations because the bilateral incidence of the tumor may be more associated with some tumor types like serous carcinomas.

Our study thus agrees with many of the previous studies with regard to tumor distribution; however, striking differences are observed in the prevalence of subtypes, especially regarding the incidence of germ cell tumors and type of malignant tumors encountered. These may be because of geographic, demographic, and methodological reasons. However, all these results reinforce the understanding that ovarian tumors are a complex entity and heterogeneous in nature, and thus diagnostic and therapeutic policies have to be tailored according to the kind of ovarian neoplasm.

Conclusion

The current study on clinical presentation and spectrum of ovarian tumors in a tertiary care setting points out that surface epithelial tumors were the most common, comprising the majority. Benign ovarian tumors consisted mainly of serous and mucinous subtypes, aside from the notable presence of mature cystic teratomas. The borderline tumors were less common; the borderline mucinous tumors were the most predominant. Among malignant ovarian tumors, the most frequently encountered was mucinous carcinoma, followed by germ cell tumors, including dysgerminomas and yolk sac tumors. These findings emphasize the varied spectrum of ovarian tumors with the predominance of benign lesions and the need for continued clinical vigilance in the management of both benign and malignant ovarian neoplasms.

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