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Original Research Article

Clinicopathological Features of Benign and Malignant Ovarian Tumors: A Prospective Study

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Abstract

Ovarian tumors encompass a broad range of gynecological conditions, from benign cysts to highly malignant cancers, each with distinct clinical and pathological characteristics. This prospective study, spanning three years, aims to comprehensively analyze the clinicopathological features of both benign and malignant ovarian tumors. We investigated a cohort of 200 patients presenting with ovarian masses at a tertiary care hospital, employing a multifaceted approach involving clinical evaluation, imaging studies, and histopathological examination to discern patterns and prognostic indicators.

Our findings reveal that benign ovarian tumors were predominantly observed in premenopausal women, with a mean age of 35 years, whereas malignant tumors were more common in postmenopausal women, with a mean age of 51 years. The study highlights those benign tumors often presented as unilocular cysts, most frequently identified as serous or mucinous cystadenomas. Conversely, malignant tumors were often solid or mixed-type masses, with serous adenocarcinoma being the most prevalent subtype.

Clinical symptoms varied between the two groups. While abdominal pain and bloating were common in both benign and malignant cases, malignancies were frequently associated with more severe symptoms such as weight loss, ascites, and gastrointestinal disturbances. Notably, the duration of symptoms before presentation was significantly longer in patients with malignant tumors, often exceeding six months.

The study underscores the critical importance of differentiating between benign and malignant ovarian masses based on clinical presentation, tumor characteristics, and histopathological findings. The presence of constitutional symptoms and certain imaging features should raise suspicion for malignancy, prompting more extensive diagnostic workup and timely surgical intervention. Our findings advocate for enhanced vigilance in the evaluation of ovarian masses, particularly in postmenopausal women, to improve early detection and treatment outcomes.

This research contributes to the understanding of ovarian tumor pathology, providing valuable insights for clinicians in differentiating between benign and malignant conditions, and emphasizing the need for thorough diagnostic approaches to optimize patient management and outcomes.

Introduction

Ovarian tumors represent a broad spectrum of gynecological pathologies, ranging from benign cysts to highly malignant cancers. These tumors pose significant diagnostic challenges due to their varied presentations, nonspecific symptoms, and the high likelihood of being detected in advanced stages, particularly in the case of ovarian cancer. Ovarian cancer is the most lethal gynecological malignancy globally, with a five-year survival rate of only about 45%, largely due to its asymptomatic nature in early stages and the absence of effective screening methods. In contrast, benign ovarian tumors, although more frequent, are often diagnosed earlier and typically have favorable outcomes with appropriate treatment.

Benign ovarian tumors account for approximately 80% of ovarian masses and are commonly seen in premenopausal women. These tumors include functional cysts, benign cystadenomas, dermoid cysts, and endometriomas, among others. While they generally present with mild symptoms, such as abdominal discomfort, irregular menstrual cycles, or bloating, benign tumors can occasionally be asymptomatic and discovered incidentally during routine pelvic examinations or imaging studies. Though they are not life-threatening, large benign tumors can cause complications such as torsion, rupture, or hemorrhage, requiring surgical intervention.

Malignant ovarian tumors, on the other hand, are more insidious, often going undetected until the disease has spread beyond the ovaries. Approximately 70% of ovarian cancers are diagnosed at an advanced stage (FIGO Stage III or IV), when the tumor has metastasized to the peritoneal cavity or distant organs. Epithelial ovarian cancer (EOC) is the most common histological subtype, accounting for about 90% of ovarian malignancies, and includes high-grade serous carcinomas, which are the most aggressive form of the disease. The other subtypes, such as mucinous, endometrioid, and clear cell carcinomas, also present distinct biological behaviors and responses to treatment. Germ cell and stromal tumors, although less common, occur more frequently in younger women.

Despite advancements in imaging and tumor markers, distinguishing between benign and malignant ovarian tumors remains a major clinical challenge. Ultrasound, particularly transvaginal ultrasound (TVUS), is the first-line imaging modality used to evaluate adnexal masses. It provides crucial information on the morphology, size, and vascularity of the tumor. Characteristics such as the presence of solid components, irregular borders, septations, papillary projections, and ascites are often associated with malignancy. However, ultrasound alone cannot reliably differentiate benign from malignant masses, as some benign conditions, like endometriomas or hemorrhagic cysts, can mimic the appearance of malignant tumors on imaging.

In addition to imaging, serum biomarkers, such as **CA-125**, are widely used to assess the risk of ovarian malignancy, especially in postmenopausal women. CA-125 is elevated in approximately 80% of women with advanced epithelial ovarian cancers, making it a valuable tool for detecting malignancy. However, CA-125 lacks specificity, as it can also be elevated in benign conditions such as endometriosis, pelvic inflammatory disease (PID), and other non-gynecological cancers. Its clinical utility is further limited in early-stage ovarian cancer, where CA-125 levels may remain within the normal range. Thus, the combination of ultrasound findings with CA-125 levels is often employed to improve diagnostic accuracy, but even this approach has limitations in premenopausal women, where benign conditions are more common.

The clinicopathological differentiation between benign and malignant ovarian tumors is essential for appropriate treatment planning and improving patient outcomes. While benign tumors can often be managed conservatively or with minimally invasive surgery, malignant tumors require more aggressive intervention, including cytoreductive surgery and chemotherapy. Early diagnosis and accurate characterization of the tumor are therefore critical for optimizing therapeutic strategies.

This study aims to prospectively evaluate the clinicopathological features of benign and malignant ovarian tumors in a cohort of 200 women presenting with ovarian masses at a tertiary care hospital. By analyzing patient demographics, clinical symptoms, imaging findings, and histopathological diagnoses, this study seeks to identify key patterns that may assist in the early detection and differentiation of benign and malignant ovarian tumors. Understanding these clinicopathological features is essential for improving diagnostic precision and guiding appropriate clinical management, ultimately contributing to better prognostic outcomes for women with ovarian tumors.

Materials and Methods

Study Design and Population

This prospective study was conducted over a period of three years, from 2015 to 2018, at Sri Aurobindo Medical College & Post Graduate Institute, Indore. A total of 200 women presenting with ovarian masses were enrolled after providing informed consent. Patients were followed from the initial clinical presentation through diagnosis and treatment.

Inclusion Criteria

- Women aged 18 and older presenting with an ovarian mass detected via imaging.
- Patients willing to undergo surgical resection of the mass.
- Agreement to provide regular follow-up for at least one year post-surgery.

Exclusion Criteria

- Patients with non-gynecological abdominal masses.
- Women who refused surgery or follow-up.
- Patients with incomplete clinical or histopathological data.

Clinical and Diagnostic Evaluation

Upon enrollment, all patients underwent a comprehensive clinical examination, including a detailed history and symptom evaluation (abdominal pain, bloating, gastrointestinal disturbances, menstrual irregularities, etc.). Transvaginal ultrasound and serum CA-125 levels were measured to assess the nature of the ovarian mass. Patients were categorized based on ultrasound findings as having cystic, solid, or mixed-type masses.

Following diagnostic evaluation, all patients underwent surgical resection of the ovarian mass, and the excised tissue was sent for histopathological analysis. Tumors were classified as benign or malignant based on the World Health Organization (WHO) classification system. Postoperatively, patients were followed for at least one year to monitor clinical outcomes.

Statistical Analysis

Data were analyzed using descriptive statistics to summarize patient demographics and tumor characteristics. The chi-square test was used for categorical variables, and the t-test was applied for continuous variables. P-values <0.05 were considered statistically significant.

Results

Patient Demographics

Of the 200 patients included in the study, 150 (75%) had benign ovarian tumors, and 50 (25%) had malignant tumors. The mean age of patients with benign tumors was 35 years (range: 18–49 years), whereas the mean age of patients with malignant tumors was 51 years (range: 40–75 years).

Premenopausal women accounted for 85% of the benign tumor cases, while 80% of malignant tumors were seen in postmenopausal women.

Patient Demographics	Benign Tumors (n=150)	Malignant Tumors (n=50)
Mean Age (years)	35	51
Premenopausal Patients	127 (85%)	10 (20%)
Postmenopausal Patients	23 (15%)	40 (80%)

Clinical Presentation

Common presenting symptoms included abdominal pain and bloating in both benign and malignant cases. However, constitutional symptoms such as weight loss, loss of appetite, and ascites were significantly more common in patients with malignant tumors. Gastrointestinal disturbances such as nausea, vomiting, and changes in bowel habits were also frequently reported by patients with malignancies. The average duration of symptoms before presentation was longer in patients with malignant tumors, often extending beyond 6 months.

Symptoms	Benign Tumors (n=150)	Malignant Tumors (n=50)
Abdominal Pain	120 (80%)	40 (80%)
Bloating/Abdominal Distension	100 (66.7%)	35 (70%)
Weight Loss	10 (6.7%)	35 (70%)
Ascites	5 (3.3%)	30 (60%)
Gastrointestinal Symptoms	30 (20%)	40 (80%)

Tumor Characteristics

Benign tumors were predominantly cystic, with 110 cases (73.3%) presenting as unilocular cysts. The most common histological subtype among benign tumors was **serous cystadenoma** (50%), followed by **mucinous cystadenoma** (30%). Malignant tumors, on the other hand, frequently presented as solid or mixed-type masses, with **serous adenocarcinoma** being the most common histological subtype (60%).

Tumor Characteristics	Benign Tumors (n=150)	Malignant Tumors (n=50)
Unilocular Cysts	110 (73.3%)	5 (10%)
Solid or Mixed-Type Tumors	40 (26.7%)	45 (90%)
Serous Cystadenoma	75 (50%)	5 (10%)
Mucinous Cystadenoma	45 (30%)	-
Serous Adenocarcinoma	-	30 (60%)

Histopathological Findings

Histopathological examination confirmed the diagnosis of benign and malignant tumors. Benign tumors were more common in younger, premenopausal women and were usually associated with favorable outcomes. In contrast, malignant tumors were more frequently diagnosed in postmenopausal women and were often advanced at the time of diagnosis, with FIGO Stage III-IV in 70% of cases.

Discussion

This prospective study of 200 women with ovarian masses provides valuable insights into the clinicopathological characteristics of benign and malignant ovarian tumors. The findings are

consistent with prior research showing that benign tumors are predominantly diagnosed in younger, premenopausal women, while malignant tumors are more frequent in postmenopausal women. The average age for benign tumors was 35 years, compared to 51 years for malignant tumors, suggesting that age and menopausal status play significant roles in tumor biology.

One of the key observations in this study was the clinical presentation of both tumor types. Abdominal pain and bloating were common symptoms in both benign and malignant cases, reflecting the non-specific nature of ovarian tumor symptoms. However, constitutional symptoms such as weight loss, ascites, and gastrointestinal disturbances were more prevalent in malignancies, suggesting that these features should raise clinical suspicion for malignancy. These findings emphasize the importance of thorough clinical evaluation and the need for heightened vigilance, particularly in postmenopausal women presenting with these symptoms.

Tumor characteristics also varied significantly between benign and malignant cases. Benign tumors were predominantly cystic, with unilocular cysts being the most common presentation. In contrast, malignant tumors often exhibited solid or mixed features, with irregular borders and increased vascularity on Doppler ultrasound. Histologically, serous adenocarcinoma was the most common malignant subtype, which aligns with the literature, where epithelial ovarian cancers are known to account for the majority of ovarian malignancies.

Conclusion

This prospective study highlights important clinicopathological differences between benign and malignant ovarian tumors. Benign tumors are more commonly seen in younger, premenopausal women and typically present as unilocular cysts with favorable outcomes. In contrast, malignant ovarian tumors predominantly affect postmenopausal women and are often diagnosed at advanced stages, associated with more aggressive clinical features such as weight loss, ascites, and gastrointestinal symptoms. Early recognition of these clinical signs and timely surgical intervention are essential to improving outcomes in patients with ovarian malignancies.

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