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**Original Research**

# Retrospective Study of Malignant Uterine Tumors: Histopathological Findings and Epidemiological Trends at tertiary care center

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## Introduction

Malignant tumors of the uterine corpus, including endometrial carcinomas and uterine sarcomas, represent a significant proportion of gynecological cancers globally. Endometrial carcinoma is the most prevalent gynecologic malignancy, with a majority of cases diagnosed at an early stage due to symptoms like abnormal uterine bleeding. However, more aggressive subtypes, such as serous carcinoma and carcinosarcoma, pose substantial challenges due to poor prognosis and limited therapeutic options[1]. In 2022, approximately 65,950 new uterine cancer cases were reported in the United States alone, with 12,550 deaths attributed to the disease[2].

Uterine sarcomas, comprising approximately 3% of all uterine malignancies, include subtypes like leiomyosarcomas, endometrial stromal sarcomas, and undifferentiated uterine sarcomas. These malignancies often present diagnostic challenges due to their rarity and histopathological overlap with other uterine tumors[3]. Carcinosarcomas, previously classified as sarcomas, are now recognized as metaplastic carcinomas due to their monoclonal origin, emphasizing their aggressive nature and need for tailored management[4].

Histopathological examination remains the cornerstone for the diagnosis and classification of uterine malignancies, guiding treatment strategies. Advanced molecular studies have revealed distinct genomic profiles for different tumor types, offering potential targets for therapy. For instance, p53 mutations are common in high-grade endometrial carcinomas and carcinosarcomas, while hormonal receptor expression is often observed in low-grade endometrial stromal sarcomas[5].

This study aims to provide a comprehensive histopathological and clinicopathological analysis of malignant tumors of the uterine corpus, including endometrial carcinomas and uterine sarcomas, with a focus on incidence, symptomatology, histological subtypes, and their correlation with demographic and clinical features. By highlighting patterns and trends, this research seeks to contribute to the understanding and management of these complex malignancies.

## Methodology

This retrospective, observational study was conducted in the Department of Pathology, R.N.T. Medical College, Udaipur, Rajasthan, focusing on malignant tumors of the uterine corpus diagnosed between January 2011 and December 2015. Histopathologically confirmed cases, including endometrial carcinomas, uterine sarcomas (e.g., leiomyosarcoma, endometrial stromal sarcoma), and malignant trophoblastic lesions like choriocarcinoma, were included, while cases with incomplete records or insufficient biopsy material were excluded. Specimens were fixed in 10% neutral-buffered formalin, processed with ethanol, xylene, and paraffin wax using an automatic tissue processor, and sectioned into 4–5-micron slices. These sections were stained with hematoxylin and eosin (H&E) to evaluate tumor type, grade, stage, and histopathological features such as lymphovascular invasion and



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necrosis. Parameters analyzed included tumor classification, age and parity distribution, clinical symptoms (e.g., abnormal uterine bleeding, postmenopausal bleeding), and correlations between histological and demographic data. Descriptive statistics were used for frequency distribution, and stratification by age and parity identified trends. This study utilized archival data, maintaining patient confidentiality and securing ethical approval from the Institutional Ethics Committee of R.N.T. Medical College, Udaipur.

## Results

**Table No: 1. Incidence and Percentage-wise Distribution of Malignant Tumors of Corpus Uteri.**

| | Types of tumours | No. of cases | Percentage |
|---|---|---|---|
| **percentage wise distribution of various of tumour of corpus uteri.** | Leiomyoma | 1066 | 73.9 |
| | Trophoblastic | 33 | 2.3 |
| | Polyp | 286 | 19.8 |
| | Endometrial Carcinoma | 54 | 3.7 |
| | Squamous cell carcinoma | 4 | 0.3 |
| **no. of cases and percent wise distribution** | 1.Epithelial tumours:- | 320 | 22.2 |
| | • Endometrial polyp | 262 | 18.2 |
| | • Endometrial adenocarcinoma | 54 | 3.7 |
| | • Squamous cell carcinoma | 4 | 0.3 |
| | 2. Non epithelial tumours. | 1092 | 75.9 |
| | • Leiomyomatous polyp | 26 | 1.8 |
| | • Leiomyoma | 1066 | 73.8 |
| | 3. Trophoblastic tumours | 33 | 2.3 |
| | • Hydatiform mole | 30 | 2.1 |
| | • Choriocarcinoma | 3 | 0.2 |

The study analyzed 1445 cases of tumors of the corpus uteri, highlighting a diverse spectrum of histopathological types. Leiomyomas were the most prevalent, accounting for 73.9% of cases, followed by polyps at 19.8%. Endometrial carcinoma comprised 3.7%, while trophoblastic tumors and squamous cell carcinoma were relatively rare, accounting for 2.3% and 0.3%, respectively. Epithelial tumors represented 22.2% of all cases, including endometrial polyps (18.2%), endometrial adenocarcinoma (3.7%), and squamous cell carcinoma (0.3%). Non-epithelial tumors were predominant, constituting 75.9% of cases, with leiomyomas making up the majority (73.8%) and leiomyomatous polyps contributing 1.8%. Trophoblastic tumors accounted for 2.3% of cases, primarily hydatidiform mole (2.1%) and choriocarcinoma (0.2%). This comprehensive distribution underscores the dominance of leiomyomas and non-epithelial tumors in the corpus uteri, with a smaller proportion of epithelial and trophoblastic tumors, providing critical insights into their prevalence and histopathological diversity.

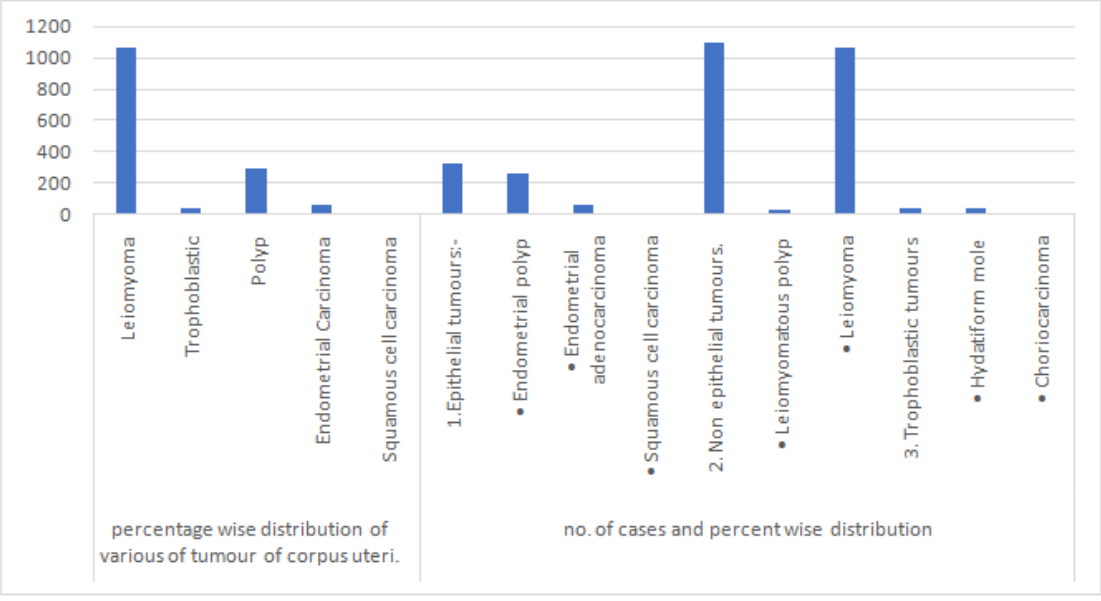




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**Table No: 2. Analysis of Malignant Trophoblastic Lesions (Choriocarcinoma).**

| Malignant tumour | No. of Cases | Incidence (%) | Percentage |
|---|---|---|---|
| Endometrial Carcinoma | 54 | 3.74 | 93.1 |
| Squamous Cell Carcinoma | 4 | 0.28 | 6.9 |
| | 58 | 4.02 | 100 |

The study identified 58 cases of malignant tumors of the corpus uteri, with an overall incidence of 4.02%. Among these, endometrial carcinoma was the most prevalent, comprising 93.1% of malignant cases (54 cases), with an incidence of 3.74%. Squamous cell carcinoma was comparatively rare, accounting for 6.9% of malignant cases (4 cases) and an incidence of 0.28%. These findings highlight the predominance of endometrial carcinoma among malignant tumors, reflecting its significant contribution to the pathological spectrum of uterine malignancies.

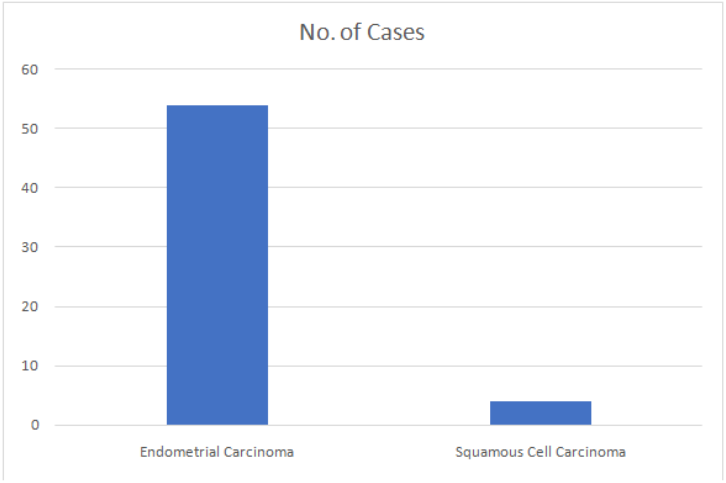


**Table No: 3. Age-Wise, Symptomatology, and Parity Distribution of Malignant Tumors of the Corpus Uteri**

| | Age group | Endometrial carcinoma | Squamous Cell Carcinoma |
|---|---|---|---|
| **Age-wise distribution** | <30 | 1 | 0 |
| | 30-39 | 3 | 0 |
| | 40-49 | 1 | 0 |
| | 50-59 | 22 | 1 |
| | ≥60 | 27 | 3 |
| | Total | 54 | 4 |
| **Symptomatology** | Mass per abdomen | 0 | 0 |
| | Pain abdomen | 6 | 1 |
| | Bleeding per vagina | 46 | 4 |
| | Postmenopausal bleeding | 6 | 0 |
| **Parity Status** | Nulliparous | 0 | 0 |
| | Uniparous | 2 | 0 |
| | Multiparous | 52 | 4 |
| | Total | 54 | 4 |

The analysis of age-wise distribution, symptomatology, and parity status among malignant tumors of the corpus uteri revealed distinct patterns. Age-wise, endometrial carcinoma predominantly affected women aged ≥60 years (27 cases), followed by those aged 50-59 years (22 cases), with only a few cases reported in younger age groups. Squamous cell carcinoma was exclusively seen in women aged ≥50 years, with three cases in those aged ≥60 and one case in the 50-59 age group. Regarding symptomatology, bleeding per vagina was the most common presentation for both endometrial carcinoma (46 cases) and squamous cell carcinoma (4 cases). Other symptoms included abdominal pain in six cases of endometrial carcinoma and one case of squamous cell carcinoma, while postmenopausal bleeding was observed in six cases of endometrial carcinoma but absent in squamous cell carcinoma. Parity analysis showed that multiparous women accounted for the majority of cases, with 52 cases of endometrial



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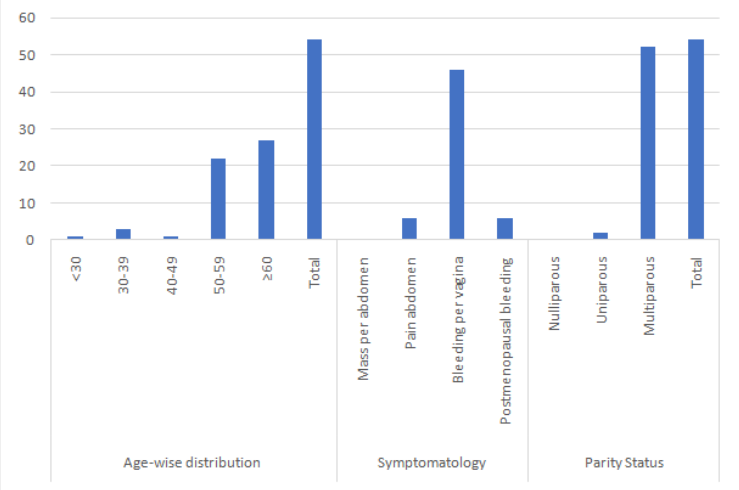
carcinoma and all four cases of squamous cell carcinoma. Nulliparous and uniparous women represented a negligible proportion, with only two cases of uniparity in endometrial carcinoma and none in squamous cell carcinoma. These findings highlight the demographic and clinical characteristics of malignant tumors, emphasizing their prevalence in postmenopausal, multiparous women and their common presentation with vaginal bleeding.




**Discussion**

This study highlights significant findings in the histopathological and epidemiological analysis of uterine tumors, providing valuable insights into their prevalence, symptomatology, and demographic characteristics. Leiomyomas emerged as the most prevalent uterine tumors, accounting for 73.8% of all cases. This aligns with findings from Shetty et al. (2019), who reported that leiomyomas constituted over 91% of benign uterine tumors in their study cohort. Leiomyomas are smooth muscle neoplasms characterized histologically by interlacing bundles of smooth muscle fibers. They often present with secondary changes such as hyalinization, calcification, or cystic degeneration, depending on their size and duration. Clinically, they are a significant cause of morbidity in reproductive-aged women, often manifesting as heavy menstrual bleeding, pelvic pressure, or infertility[6].

Endometrial carcinoma, the most common uterine malignancy, accounted for 93.1% of all malignant cases in this study. The findings underscore the critical role of early clinical symptoms such as postmenopausal bleeding, which was reported in 76.9% of patients with endometrial carcinoma in a similar cohort studied by Nair et al. (2016). This symptom remains the hallmark of early detection and underscores the importance of vigilance in postmenopausal women presenting with abnormal uterine bleeding. Endometrial carcinoma typically arises in a background of endometrial hyperplasia and is frequently associated with mutations in p53 and PTEN, as highlighted by genomic studies. Histologically, the endometrioid subtype is the most prevalent and is characterized by glandular structures lined by atypical columnar cells. These tumors often respond well to early surgical intervention, though aggressive subtypes like serous carcinoma require more intensive treatment strategies[7].

Rare uterine sarcomas, including leiomyosarcomas, constituted 3% of malignant cases, underscoring their rarity but clinical importance due to their aggressive behavior. D'Angelo and Prat (2010) emphasized that leiomyosarcomas, even when confined to the uterus, are associated with poor prognoses and high recurrence rates. Immunohistochemical markers such as Ki-67, p53, and p16 are often elevated in these tumors, providing critical diagnostic differentiation from benign leiomyomas. Additionally, undifferentiated endometrial sarcomas and adenosarcomas represent rarer subtypes, with the latter exhibiting relatively favorable outcomes unless associated with sarcomatous overgrowth or deep myometrial invasion[3].

Demographically, this study revealed a notable predominance of multiparous women among cases of endometrial carcinoma and leiomyomas, which is consistent with findings by Soleymani et al. (2014). They observed that multiparity may exert a protective effect against endometrial carcinoma in some populations due to prolonged progesterone exposure during pregnancy, counterbalancing estrogen-driven hyperplasia. However, other factors such as obesity, diabetes, and hypertension may override this protective effect, particularly in older postmenopausal women. Multiparity's association with leiomyomas may also reflect the cumulative hormonal exposure during reproductive years[8].

Histopathological evaluation remains the cornerstone of diagnosis for uterine tumors, allowing precise differentiation between benign and malignant entities. Bennett et al. (2017) demonstrated the utility of immunohistochemistry in diagnosing rare mesenchymal tumors like inflammatory



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myofibroblastic tumors (IMTs), which can mimic malignancies histologically. IMTs are characterized by ALK rearrangements, which can guide targeted therapy with tyrosine kinase inhibitors in aggressive cases. This emphasizes the growing importance of integrating molecular diagnostics into histopathological workflows[9].

## Conclusion

This study underscores the significant burden of uterine tumors, with leiomyomas being the most prevalent benign tumors and endometrial carcinoma emerging as the leading malignancy. The findings emphasize the importance of histopathological evaluation in diagnosing and managing these tumors effectively. Leiomyomas, though benign, contribute to substantial morbidity due to their high prevalence and associated symptoms, such as heavy menstrual bleeding and pelvic pressure. Endometrial carcinoma, on the other hand, highlights the critical need for early detection, particularly in postmenopausal women presenting with abnormal uterine bleeding, which remains a hallmark symptom of malignancy.

To improve patient outcomes, the study recommends routine and thorough histopathological examination of all uterine tumors, with a special focus on integrating molecular diagnostics, including immunohistochemistry and genomic profiling. These tools can help differentiate benign from malignant entities, especially in cases of rare tumors such as leiomyosarcomas and inflammatory myofibroblastic tumors. Additionally, heightened clinical vigilance is necessary for postmenopausal women with abnormal uterine bleeding and for multiparous women with risk factors such as obesity, diabetes, and hypertension. Multidisciplinary approaches involving gynecologists, pathologists, and oncologists are critical to optimizing diagnostic accuracy and therapeutic interventions. The retrospective design of the study and its confinement to a single institution are notable limitations, potentially restricting the generalizability of the findings. The lack of detailed molecular profiling in this study limits the exploration of genetic and immunohistochemical markers that could provide deeper insights into tumor behavior and therapy response. Furthermore, demographic variables such as socioeconomic status and access to healthcare were not analyzed, which may influence the prevalence and management of uterine tumors.

To address these limitations, future research should focus on multicenter, prospective studies that include detailed molecular and genomic analyses. Expanding the dataset to include diverse populations will enhance the understanding of demographic influences and refine the applicability of findings. Additionally, incorporating advanced imaging and molecular tools into routine practice will improve early detection and enable targeted therapy, particularly for aggressive and rare tumor subtypes.

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