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RESEARCH ARTICLE
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HISTOPATHOLOGICAL ANALYSIS OF BENIGN TUMORS OF THE UTERINE CORPUS: A RETROSPECTIVE FIVE-YEAR STUDY AT TERTIARY CARE CENTER.

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Introduction

Benign tumors of the uterine corpus are among the most prevalent gynecological conditions affecting women of reproductive and perimenopausal age groups worldwide. These tumors, primarily represented by leiomyomas (commonly known as fibroids), endometrial polyps, and benign trophoblastic lesions such as hydatidiform moles, constitute a significant cause of morbidity, including abnormal uterine bleeding, pelvic pain, and infertility[1]. Despite their benign nature, these lesions necessitate careful histopathological evaluation due to their potential overlap with malignant counterparts.

Leiomyomas, the most common benign neoplasms of the uterine corpus, are smooth muscle tumors often associated with heavy menstrual bleeding, pelvic pressure, and infertility. They predominantly occur in multiparous women in their fourth and fifth decades of life and are typically located intramurally[2]. Histopathologically, these tumors are characterized by their well-defined smooth muscle bundles, which may undergo degenerative changes such as hyalinization and calcification[3].

Endometrial polyps are localized overgrowths of endometrial tissue comprising glands, stroma, and blood vessels. These lesions are a frequent finding in women presenting with abnormal uterine bleeding, particularly in perimenopausal and postmenopausal age groups[1]. While generally benign, histological examination is crucial to rule out premalignant changes or malignancy, especially in symptomatic women.

Benign trophoblastic lesions, including hydatidiform moles, are less common but clinically significant due to their association with gestational events and potential progression to malignancy. These lesions, typically presenting in women of reproductive age, require precise histopathological differentiation from invasive or malignant trophoblastic diseases[1].

Hormonal influences, particularly involving estrogen and progesterone, play a significant role in the pathogenesis of benign uterine tumors. Dysregulation of hormone receptors and associated signaling pathways contribute to the development and growth of these lesions (Kossaï & Penault-Llorca, 2020). Understanding these mechanisms is vital for the development of targeted therapies and preventive strategies.

This study aims to provide a comprehensive histopathological analysis of benign uterine corpus tumors, focusing on leiomyomas, endometrial polyps, and benign trophoblastic lesions. By

examining age distribution, symptomatology, histological subtypes, and associated endometrial changes, this research seeks to contribute to the diagnostic and therapeutic management of these conditions.

Methodology

This retrospective, observational study was conducted in the Department of Pathology, R.N.T. Medical College, Udaipur, Rajasthan, and included excision biopsies of benign neoplastic lesions of the uterine corpus (leiomyomas, endometrial polyps, and benign trophoblastic lesions such as hydatidiform mole) over five years (January 2011 to December 2015). Archival records provided patient demographics, clinical presentations, and histopathological data, excluding malignant cases or insufficient biopsy materials. Specimens were fixed in 10% neutral-buffered formalin, processed with ethanol, xylene, and paraffin wax using an automatic tissue processor, embedded in molds, sectioned at 4–5 microns using a rotary microtome, stained with hematoxylin and eosin (H&E), and mounted with toluene-based synthetic resin. Histological parameters included tumor type, frequency, size, location, degenerative changes, symptomatology, age, parity, endometrial status, and associated lesions like adenomyosis. Data were analyzed for frequency, age and parity distribution, and correlations between histological and clinical features. Ethical approval was secured, and patient confidentiality was maintained, as no direct patient interaction occurred during this study.

Results

Table No: 1. Analysis of Clinical, Pathological, and Demographic Characteristics of Leiomyomas

Leomyomas		No of cases	Percentage
size	≤5	739	69.3
	06 to 10	266	24.9
	11 to15	51	4.8
	>15	10	0.9
	Total	1066	100
symptomatology	Mass per abdomen	233	21.9
	Pain abdomen	562	52.7
	Bleeding per vagina	580	54.4
	Menorrhagia	90	8.4
	White discharge per vagina	35	3.3
	Amenorrhea	-	-
	Mass per vagina	21	1.9
	Difficulty in passing urine	25	2.3
	Irregular Bleeding	11	1.03
site wise distribution	Intramural alone	762	71.4
	Submucosal alone	98	9.2
	Subserosal alone	85	8
	Intramural, Submucosal	16	1.5
	Intramural, Subserosal	84	7.9
	Submucosal, Subserosal	13	1.2
	Intramural Submucosal, Subserosal	8	0.8
	Total	1066	100
parity status	Nulliparous	2	0.2
	Uniparous	57	5.3
	Multiparous	1007	94.4

	Total	1066	100
status of endometrium	Proliferative phase	952	89.3
	Secretory phase	106	10
	Atrophy	8	0.7
	Total	1066	100
Age wise distribution	<30	15	1.4
	30-39	238	22.3
	40-49	619	58
	50-59	168	15.8
	≥60	26	2.4
	Total	1066	100

This study on leiomyomas, conducted on 1066 cases, provides a detailed understanding of their clinical, pathological, and demographic characteristics. The size distribution of leiomyomas showed that the majority (69.3%) were ≤5 cm, followed by 24.9% measuring between 6 to 10 cm. Larger leiomyomas, between 11 to 15 cm and >15 cm, were observed in 4.8% and 0.9% of cases, respectively, indicating the predominance of smaller leiomyomas in the study population.

Symptomatology revealed a wide range of clinical presentations, with the most common being bleeding per vagina (54.4%) and pain abdomen (52.7%). Mass per abdomen was reported in 21.9% of cases, while less frequent symptoms included menorrhagia (8.4%), white discharge per vagina (3.3%), and difficulty in passing urine (2.3%). Rare presentations such as irregular bleeding (1.03%) and mass per vagina (1.9%) were also noted, reflecting the variability in symptom severity and type.

The site-wise distribution highlighted that leiomyomas predominantly occurred intramurally, accounting for 71.4% of cases, followed by submucosal (9.2%) and subserosal (8%) locations. A smaller proportion of cases demonstrated combinations of multiple sites, such as intramural with submucosal (1.5%) or subserosal (7.9%), while all three sites were involved in only 0.8% of cases. This distribution underscores the predominance of intramural leiomyomas and the complexity observed in a subset of cases.

Parity status analysis revealed that most patients with leiomyomas were multiparous (94.4%), with a smaller proportion being uniparous (5.3%) or nulliparous (0.2%). This finding suggests a possible link between parity and the development or detection of leiomyomas. Endometrial status further emphasized the hormonal responsiveness of leiomyomas, with the proliferative phase observed in 89.3% of cases, followed by the secretory phase in 10%. Atrophic endometrium was rare, seen in only 0.7% of cases.

Age-wise distribution showed that leiomyomas were most prevalent in women aged 40-49 years, accounting for 58% of cases, followed by the 30-39 age group (22.3%). Women under 30 years and over 60 years had significantly lower occurrences, at 1.4% and 2.4%, respectively. This pattern highlights the reproductive age as the period most affected by leiomyomas, aligning with their known hormonal dependence.

In conclusion, this comprehensive analysis provides significant insights into the characteristics of leiomyomas, highlighting their clinical variability, demographic correlations, and pathological features. These findings are crucial for enhancing the understanding and management of leiomyomas in clinical practice.

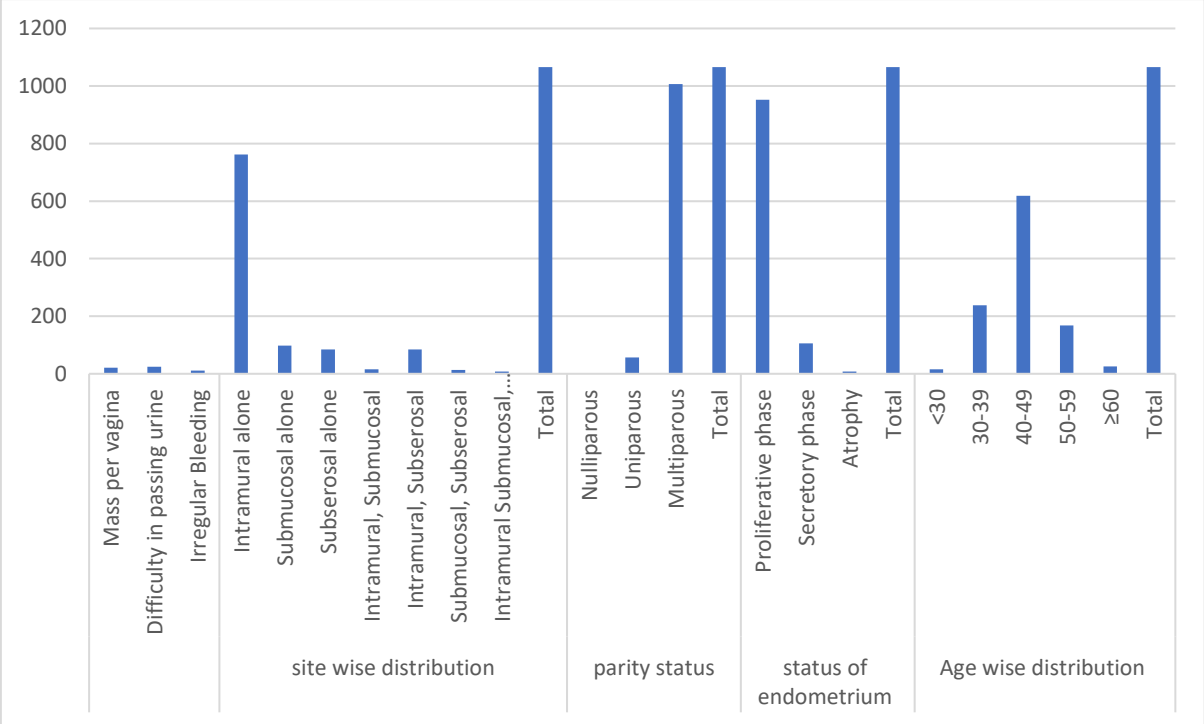


Table No: 2. Occurrence of Different Types of Degenerations in Leiomyomas

	Type of degeneration	No. of cases	Incidence (%)	Percentage
occurrence of different types of degenerations	Hyaline	24	2.3	89
	Myxoid	3	0.3	11
	Total	27	2.6	100

The study also analyzed the occurrence of different types of degenerations in leiomyomas, highlighting two primary forms: hyaline degeneration and myxoid degeneration. Hyaline degeneration was the most common type, observed in 24 cases, accounting for 2.3% of the total leiomyomas studied and representing 89% of all degenerative cases. Myxoid degeneration, on the other hand, was relatively rare, identified in only 3 cases, which made up 0.3% of total leiomyomas and 11% of all degenerative cases.

In total, 27 cases exhibited degeneration, corresponding to 2.6% of all leiomyomas, indicating that degenerative changes, though uncommon, are a notable pathological feature in certain leiomyomas. This data provides insights into the types and frequencies of degenerations, contributing to a better understanding of the pathological variations observed in leiomyomas.

Table No: 3. Analysis of Clinical and Pathological Characteristics of Polyps

Polyps		No. of cases	Percentage
different types	Endometrial	260	91
	Leiomyomatous	26	9
	Total	286	100
endometrium status	Proliferative phase	216	75.5
	Secretory phase	41	14.3
	Adenomatous hyperplasia	29	10.2
	Total	1066	100
Age wise distribution	<30	8	2.8
	30-39	52	18.2
	40-49	128	44.8

	50-59	63	22
	≥60	35	12.2
	Total	286	100
parity	Nulliparous	15	5.2
	Uniparous	18	6.3
	Multiparous	253	88.5
	Total	286	100
symptomatology	Mass per abdomen	2	0.7
	Pain abdomen	60	21
	Bleeding per vagina	137	47.9
	White discharge per vagina	106	37.1
	Mass per vagina	7	2.4

The study of polyps included a total of 286 cases, providing insights into their types, endometrial status, demographic distribution, parity, and clinical presentations. These findings shed light on the variability in their occurrence and associated characteristics.

The distribution of different types of polyps revealed that endometrial polyps were the most common, comprising 91% (260 cases) of all cases, while leiomyomatous polyps accounted for only 9% (26 cases). This highlights the predominance of endometrial polyps in the studied population.

The status of the endometrium in these cases showed that the proliferative phase was observed in 75.5% of cases (216 cases), followed by the secretory phase in 14.3% (41 cases). Adenomatous hyperplasia was less common, present in 10.2% (29 cases). This data emphasizes the hormonal influence on polyp development.

Age-wise distribution demonstrated that polyps were most prevalent in women aged 40-49 years, accounting for 44.8% (128 cases), followed by the 50-59 age group with 22% (63 cases). Women aged 30-39 years comprised 18.2% (52 cases), while those under 30 years (2.8%, 8 cases) and over 60 years (12.2%, 35 cases) had fewer occurrences. This indicates a higher prevalence of polyps during the late reproductive and perimenopausal years.

Parity status showed that the majority of patients with polyps were multiparous (88.5%, 253 cases), with a smaller percentage being uniparous (6.3%, 18 cases) or nulliparous (5.2%, 15 cases). This suggests a possible association between parity and the development of polyps.

The clinical presentations of polyps varied, with bleeding per vagina being the most common symptom, reported in 47.9% (137 cases) of cases. Other symptoms included white discharge per vagina (37.1%, 106 cases), pain abdomen (21%, 60 cases), and less commonly, mass per vagina (2.4%, 7 cases) and mass per abdomen (0.7%, 2 cases). This highlights the diverse symptomatology of polyps, which may range from asymptomatic to significant clinical manifestations.

In conclusion, the analysis of polyps revealed important clinical and pathological characteristics, including their prevalence, hormonal associations, demographic factors, and symptomatology. These findings contribute to a better understanding of polyps, facilitating improved diagnosis and management in clinical settings.

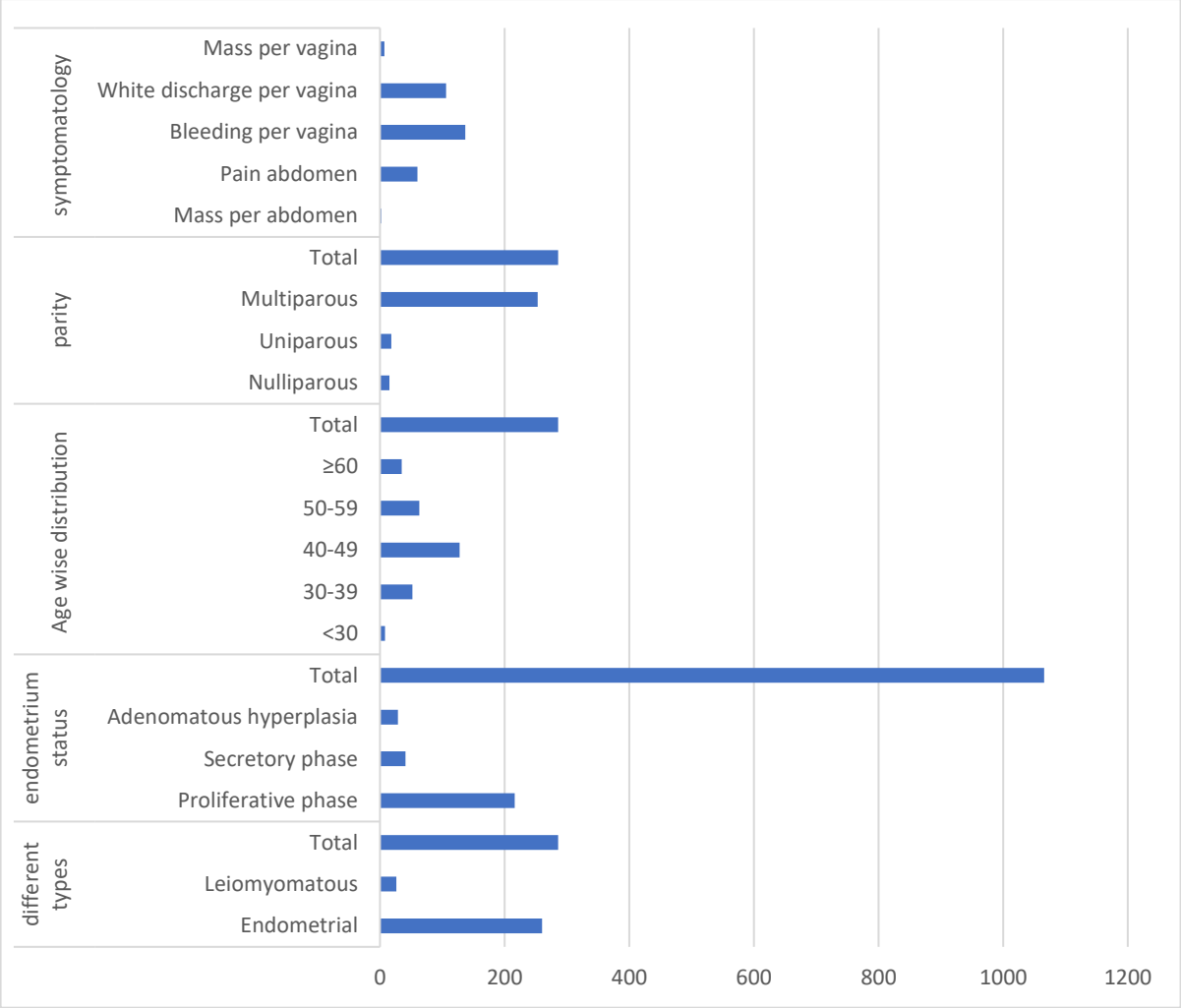


Table No: 4. Analysis of Trophoblastic Tumors and Associated Characteristics

trophoblastic tumours	Trophoblastic	No. of Cases	Percentage
occurrence of trophoblastic lesions	Hydatiform Mole	30	91
	Choriocarcinoma	3	9
	Total	33	100
Age wise distribution	<30	19	57.6
	30-39	13	39.4
	40-49	1	3
	50-59	0	0
	≥60	0	0
	Total	33	100
Parity wise distribution	Nulliparous	0	0
	Uniparous	23	69.7
	Multiparous	10	30.3
	Total	33	100
symptomatology	Bleeding per Vagina	28	62.2
	Pain abdomen	15	33.3
	Mass Per Abdomen	2	4.4

The study on trophoblastic tumors included a total of 33 cases, analyzing the occurrence of lesions, age and parity distribution, and clinical symptomatology. These findings provide a comprehensive understanding of the prevalence and clinical features of trophoblastic tumors.

The occurrence of trophoblastic lesions was dominated by hydatidiform mole, which was identified in 30 cases, accounting for 91% of all trophoblastic tumors. Choriocarcinoma was less frequent, observed in only 3 cases (9%). This highlights the predominance of hydatidiform mole among trophoblastic tumors.

The age-wise distribution revealed that the majority of cases occurred in women under 30 years, with 57.6% (19 cases) in this age group. Women aged 30-39 years accounted for 39.4% (13 cases), while cases in the 40-49 age group were rare (3%, 1 case). There were no reported cases in women aged 50 and above, indicating that trophoblastic tumors predominantly affect younger women.

The parity-wise distribution showed that trophoblastic tumors were most common in uniparous women, comprising 69.7% (23 cases). Multiparous women accounted for 30.3% (10 cases), and there were no cases among nulliparous women. This suggests a strong association of trophoblastic tumors with previous pregnancies.

The symptomatology of trophoblastic tumors varied, with bleeding per vagina being the most common symptom, reported in 62.2% (28 cases) of cases. Pain abdomen was present in 33.3% (15 cases), while mass per abdomen was a rare symptom, observed in 4.4% (2 cases). These symptoms reflect the clinical presentations of trophoblastic tumors and their impact on patient health.

In conclusion, the analysis of trophoblastic tumors underscores the predominance of hydatidiform mole among younger, uniparous women, with bleeding per vagina being the most common clinical presentation. These findings provide critical insights into the demographic and clinical patterns of trophoblastic tumors, aiding in their diagnosis and management.

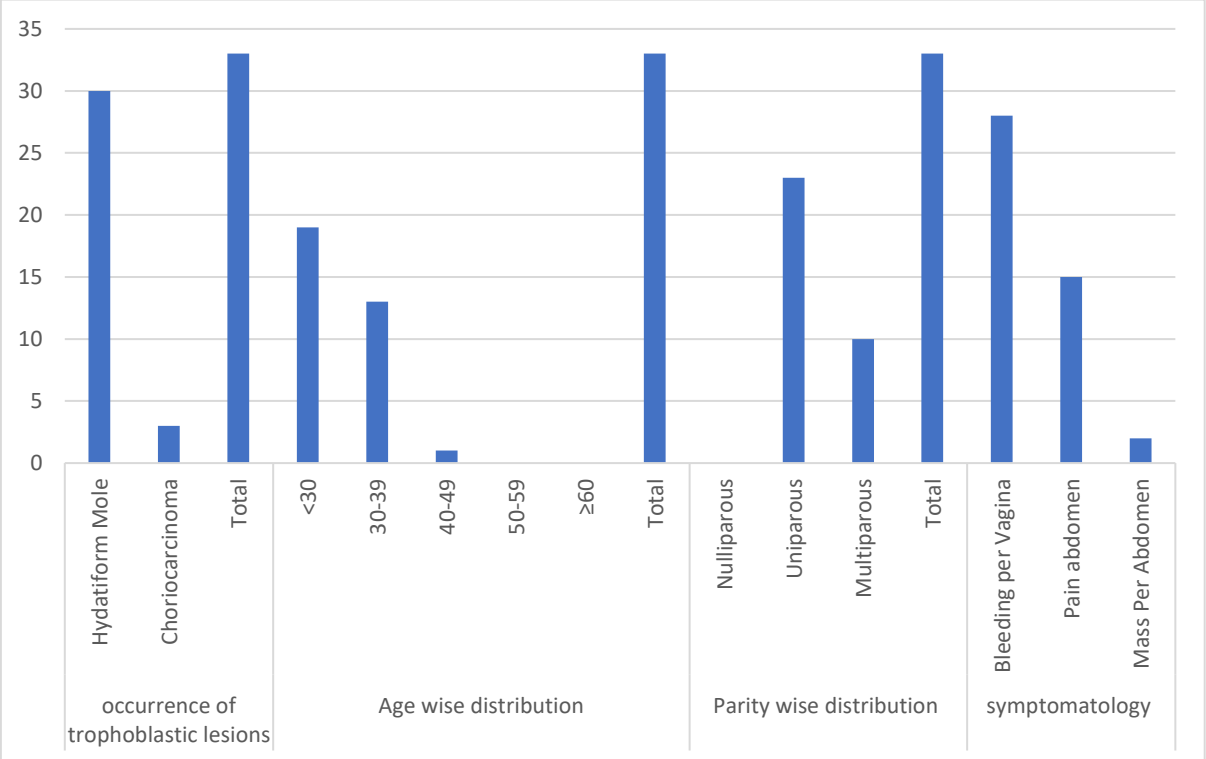


Table No: 5. Analysis of Tumor Types and Associated Lesions

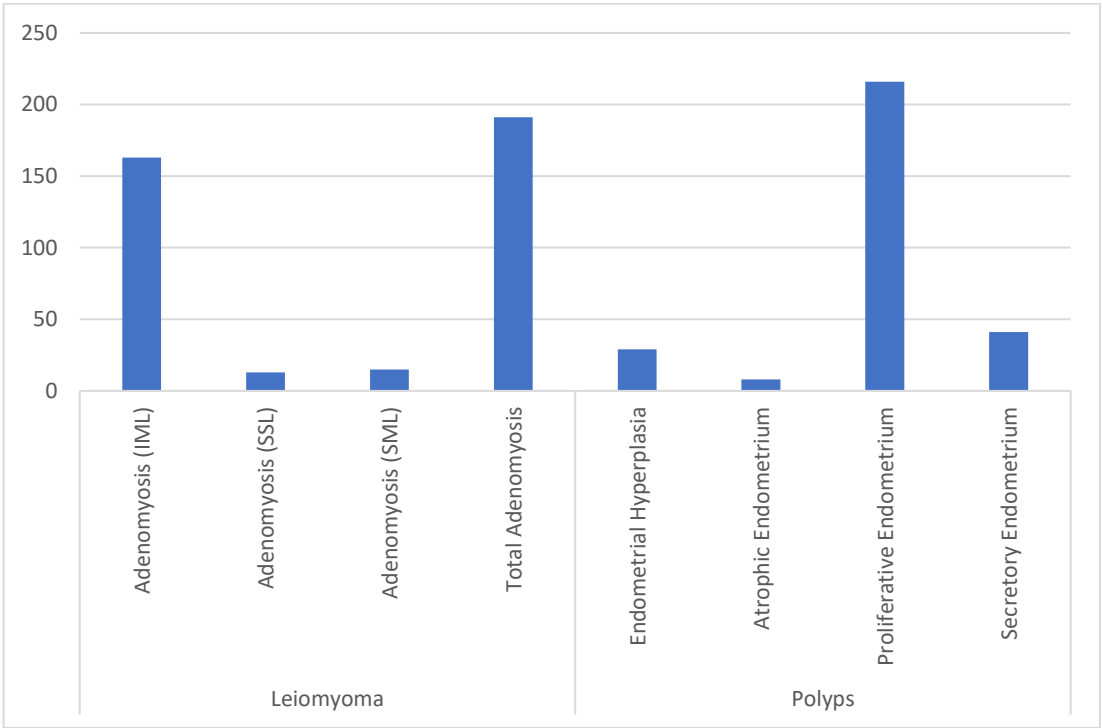
Tumor Type	Associated Lesion	Number of Cases	Percentage (%)
Leiomyoma	Adenomyosis (IML)	163	15.3
	Adenomyosis (SSL)	13	1.2
	Adenomyosis (SML)	15	1.4
	Total Adenomyosis	191	17.9
Polyps	Endometrial Hyperplasia	29	10.2
	Atrophic Endometrium	8	2.8
	Proliferative Endometrium	216	75.5
	Secretory Endometrium	41	14.3

The study examined various tumor types and their associated lesions, focusing on leiomyomas and polyps, providing insights into their prevalence and pathological characteristics.

Leiomyomas were frequently associated with adenomyosis, which was further categorized based on its site of occurrence. Adenomyosis in the intramural layer (IML) was the most common, observed in 163 cases (15.3%). Adenomyosis in the subserosal layer (SSL) and submucosal layer (SML) were less frequent, accounting for 1.2% (13 cases) and 1.4% (15 cases), respectively. In total, adenomyosis was associated with leiomyomas in 191 cases, representing 17.9% of all leiomyoma cases. This highlights the significant coexistence of adenomyosis with leiomyomas, particularly in the intramural layer.

Polyps exhibited various associated endometrial lesions, predominantly characterized by the status of the endometrium. The proliferative endometrium was the most commonly observed lesion, seen in 216 cases (75.5%), followed by secretory endometrium in 41 cases (14.3%). Endometrial hyperplasia was present in 29 cases (10.2%), and atrophic endometrium was noted in 8 cases (2.8%). These findings underscore the hormonal responsiveness of polyps and their association with different phases of the endometrium.

In summary, the analysis of tumor types and their associated lesions highlights the coexistence of adenomyosis with leiomyomas and the diverse endometrial changes associated with polyps. These findings are critical for understanding the pathological spectrum of these conditions and guiding their clinical management.



Discussion

This study comprehensively examined benign uterine tumors, including leiomyomas, polyps, and trophoblastic tumors, focusing on their clinical presentations, pathological features, and demographic patterns. Leiomyomas, the most common tumors in this analysis, predominantly affected multiparous women aged 40–49 years. This aligns with previous findings, where leiomyomas were shown to peak in reproductive and perimenopausal ages, influenced by the hormonal interplay of estrogen and progesterone[5]. Intramural leiomyomas were the most common type in our study, consistent with their clinical predominance due to their deep myometrial location, often causing symptoms such as bleeding and abdominal pain[6].

Interestingly, our findings on degenerative changes, particularly hyaline degeneration (89% of degenerated leiomyomas), reflect the natural history of leiomyomas as they grow or age, consistent with literature describing vascular compromise in these tumors[7]. Leiomyomas with chromosomal alterations, such as MED12 mutations, have been shown to exhibit specific clinical and histological features, including smaller sizes and subserosal locations, which might further refine the categorization and management strategies of these tumors[8].

Polyps, predominantly endometrial (91% of cases), were associated with a high prevalence of the proliferative endometrium, reflecting their hormonal dependence and the importance of estrogen in their pathogenesis. These findings align with studies demonstrating the need for histopathological evaluation of polyps to detect premalignant or malignant transformations, particularly in cases with adenomatous hyperplasia[9].

The analysis of trophoblastic tumors highlights their predominance in younger, uniparous women, particularly hydatidiform moles. The high rate of vaginal bleeding as a presenting symptom (62.2%) underscores the invasive potential of these lesions and the necessity of early detection and management to prevent progression to choriocarcinoma[10].

Furthermore, our findings on adenomyosis coexisting with leiomyomas in 17.9% of cases emphasize the overlapping pathophysiological mechanisms driven by hormonal and structural uterine remodeling. This aligns with existing evidence suggesting that adenomyosis often occurs in multiparous women with leiomyomas due to shared etiological pathways[11].

Conclusion

This study provides comprehensive insights into the clinical, pathological, and demographic characteristics of benign tumors of the uterine corpus, including leiomyomas, polyps, and trophoblastic tumors. Leiomyomas were predominantly small (≤5 cm) and intramural, most commonly affecting multiparous women in their reproductive and perimenopausal years, with a peak prevalence in the 40–49 age group. Degenerative changes, such as hyaline degeneration, were noted in a subset, reflecting their progressive nature. Endometrial polyps were strongly associated with the proliferative phase of the endometrium, highlighting their hormonal dependence, while trophoblastic tumors, primarily hydatidiform moles, were prevalent in younger, uniparous women, underlining their gestational associations. The frequent coexistence of adenomyosis with leiomyomas suggests shared hormonal and structural remodeling mechanisms. Routine histopathological evaluation is strongly recommended for all excised specimens to ensure accurate diagnosis and to identify premalignant changes early, particularly in polyps and trophoblastic tumors. Hormonal therapies targeting the underlying pathogenesis could provide a valuable approach to managing hormonally dependent tumors like leiomyomas and polyps. Regular follow-up and imaging are also crucial for monitoring progression, especially in patients with large or multiple tumors. However, the study's retrospective design limited the assessment of long-term outcomes and genetic or lifestyle factors, which may influence tumor development and recurrence. Future research should include prospective studies incorporating genetic and lifestyle data to address these limitations and explore novel therapeutic approaches. Such efforts will enhance diagnostic accuracy, optimize treatment strategies, and improve outcomes for patients with benign uterine tumors.

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