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Histopathological Evaluation of Endometrium in Abnormal Uterine Bleeding

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ABSTRACT
Abnormal uterine bleeding (AUB) is a prevalent gynacological complaint, affecting a significant proportion of the female population. Identifying the underlying causes through histopathological examination can offer insights into appropriate therapeutic interventions. To evaluate the histopathological patterns of the endometrium in patients presenting with AUB. A retrospective study was conducted over a span of two years, where endometrial samples of 180 patients with AUB were assessed. Histopathological examinations were performed following standard protocols and the results were categorized based on the identified patterns. Histopathological examination revealed various patterns, including proliferative phase, simple and complex hyperplasia, chronic endometritis and disordered proliferative endometrium and adenocarcinoma. The distribution of these patterns was recorded, with certain patterns being more predominant than others. Histopathological evaluation remains an indispensable tool for discerning the etiology of AUB. The diverse patterns observed highlight the multifactorial nature of AUB and underscore the importance of individualized therapeutic approaches.

INTRODUCTION

Abnormal uterine bleeding (AUB) remains one of the most common and challenging clinical presentations encountered in gynecological practice. Defined by its irregularity in volume, frequency, regularity or duration of menstrual flow, AUB has significant implications on a woman's health, quality of life and healthcare resource utilization[1].

Various factors can contribute to the development of AUB, including organic causes like polyps, adenomyosis, leiomyoma, malignancy and hyperplasia, and non-organic causes often attributed to hormonal disturbances[2]. These etiological aspects underscore the complexity of its pathogenesis and the necessity for a comprehensive approach to its diagnosis and management.

Histopathological evaluation of the endometrium, which can be performed after obtaining samples through techniques like endometrial biopsy or dilation and curettage, provides critical insights into the underlying causes of AUB[3]. This microscopic examination offers valuable information regarding the cellular and tissue structure of the endometrium, helping in distinguishing between benign and malignant conditions, hormonal imbalances and inflammatory processes[4]. The resultant patterns and findings are integral to guide clinicians in prescribing targeted treatments and predicting therapeutic outcomes.

Aim: To evaluate and categorize the histopathological patterns of the endometrium in patients presenting with abnormal uterine bleeding in order to get a better understanding of the underlying etiologies and enhance the clinical management of the condition.

Objectives:

- To ascertain the prevalence of various histopathological patterns in the endometrial samples of patients with abnormal uterine bleeding
- To determine the correlation between specific histopathological findings and the clinical presentation or severity of abnormal uterine bleeding
- To assess the potential diagnostic efficacy and limitations of histopathological evaluation as a primary tool for determining the etiology of abnormal uterine bleeding

MATERIALS AND METHODS

Study design: This was a two-year retrospective study conducted to analyze the histopathological patterns in endometrial samples of patients presenting with abnormal uterine bleeding.

Study period: The study was carried out over a period of two years, covering endometrial samples collected between January-December 2021-2022.

Study setting: The research was conducted at Shri Vasantrao Naik Government Medical College, in the Department of Pathology.

Sample size: A total of 180 endometrial samples of patients diagnosed with abnormal uterine bleeding were included in this study.

Sample selection: Endometrial samples were retrieved from the hospital's pathology archives. All samples belonged to patients who presented with complaints of abnormal uterine bleeding during the study period. It include endometrial shedding, curratage sample from endometrium, endometrial biopsy and hysterectomy specimen.

Inclusion criteria: Endometrial samples of patients diagnosed with abnormal uterine bleeding. Samples obtained during the specified two-year period.

Exclusion criteria: Samples with inadequate tissue for histopathological examination. Samples from patients with a history of endometrial treatment prior to the biopsy.

Histopathological evaluation: All endometrial samples were fixed in formalin and embedded in paraffin blocks. Sections of 4-5 micrometres thickness were cut and stained with Hematoxylin and Eosin (H and E) for histopathological examination. The slides were then assessed by experienced pathologists who were blinded to the clinical details. The findings were categorized based on established histopathological patterns.

Data collection: Data were extracted from patient medical records and the pathology report archive. Information collected included age of ths patient, nature of sample, clinical presentation and histopathological findings.

Statistical analysis: The data were entered into a computerized database and analysed using (specific statistical software, e.g. SPSS). Descriptive statistics were used to summarize the data. Frequencies and percentages were computed for categorical variables. Correlations between clinical presentation and histopathological findings were explored using chi-square test.

OBSERVATION AND RESULTS

The patients are categorized into seven age groups. The majority of participants fall into age range of 40-49 years, constituting 25.00% of the total,

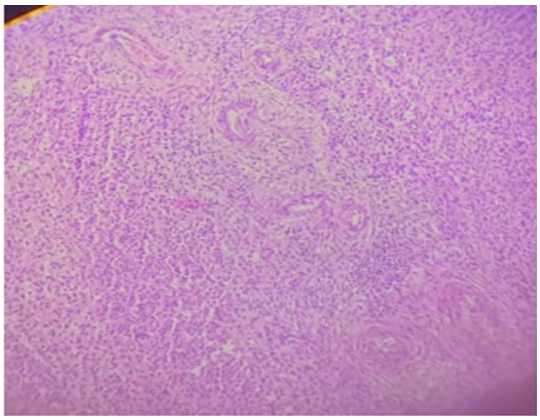

Fig. 1: Low grade endometrial sarcoma 40xHE

Fig. 2: Endometrial papillary adenocarcinoma

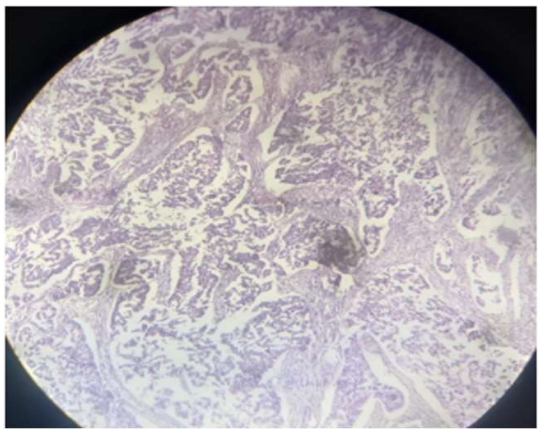

Fig. 3: Endometrial adenocarcinoma 10XHE

followed by the 30-39 years age group with 19.44%. Patients aged 20-29 years and 50-59 years make up 13.89% and 16.67% of the total, respectively. Smaller percentages are represented by patients under 20 years (5.56%) aged 60-69 years (11.11%) and 70 years and above (8.33%). This distribution reflects the diversity of age groups included in the study and their respective contributions to the overall patient

Table 1: Age-wise distribution of patients for histopathological evaluation of endometrium in abnormal uterine bleeding study

Age group	Number of patients (n)	Percentage
≤20 years	10	5.56
20-29 years	25	13.89
30-39 years	35	19.44
40-49 years	45	25.00
50-59 years	30	16.67
60-69 years	20	11.11
70+ years	15	8.33
Total	180	100

Table 2: Histopathological patterns of the endometrium in patients with abnormal uterine bleeding

Histopathological Pattern	n (%)
Proliferative phase	60 (36.1)
Endometrial hyperplasia without atypia	48 (26.6)
Atypical hypeplasia	03
Chronic endometritis	5 (2.8)
Disordered proliferative endometrium	3 (1.7)
Low grade endometrial stromal sarcoma	2 (1.1)
Papillary endometrial carcinoma	2 (1.1)
Endometrial polyp	7 (3.9)
Secretory phase	16 (8.9)
Retained product of conception	12 (6.7)
Well-differentiated adenocarcinoma of the endometrium	3 (1.1)
Total	180 (100)

population. Table 2 presents histopathological patterns of the endometrium in patients experiencing abnormal uterine bleeding. The most common pattern observed is the proliferative phase, accounting for 36.1% of cases, followed by simple hyperplasia without atypia at 25.5%. Complex hyperplasia without atypia is less common, making up 5 cases, while simple hyperplasia with atypia is seen in only 3 cases. Chronic endometritis and disordered proliferative endometrium are found in 2.8% and 1.7% of cases, respectively. More rare patterns such as low-grade endometrial stromal sarcoma, papillary endometrial carcinoma, endometrial polyps, secretory phase, retained product of conception and well-differentiated adenocarcinoma of the endometrium are also reported, each with their respective frequencies. In total the table comprises 180 cases, offering insights into the histopathological diversity associated with abnormal uterine bleeding.

Table 3 presents the correlation between histopathological patterns of the endometrium and the clinical presentation or severity of abnormal uterine bleeding (AUB). The data is stratified into mild, moderate and severe AUB categories. For the proliferative phase pattern, 5.6% (n = 10) of the cases were classified as mild, with a confidence interval of (4.0-7.2) 13.9% (n = 25) as moderate with a confidence interval of (11.5-16.3) and 16.7% (n = 30) as severe with a confidence interval of (14.5-18.9). Simple atypical hyperplasia was noted in 4.4% (n = 8) of the mild AUB cases, 12.2% (n = 22) of the moderate cases, and 5.6% (n = 10) of the severe cases, with respective confidence intervals. Chronic endometritis was least frequent, being present in 1.7% (n = 3) of mild cases, 0.6% (n = 1) of moderate and 0.6% (n = 1) of severe AUB cases. The total sample size across all categories was 180 patients.

Table 3: Correlation between histopathological patterns and clinical presentation severity of AUB

Histopathological pattern	Mild AUB (n,%)	95% CI for mild	Moderate AUB (n,%)	95% CI for moderate	Severe AUB (n,%)	95% CI for severe	Total
Proliferative phase	10 (5.6)	[4.0-7.2]	25 (13.9)	[11.5-16.3]	30 (16.7)	[14.5-18.9]	65 (36.1%)
Simple atypical hyperplasia	8 (4.4)	[2.8-6.0]	22 (12.2)	[9.9-14.5]	10 (5.6)	[4.0-7.2]	40 (22.2%)
Chronic endometritis	3 (1.7)	[0.6-2.8]	1 (0.6)	[0.1-1.1]	1 (0.6)	[0.1-1.1]	5 (2.8%)
Total	21 (11.7)	-	48 (26.7)	-	41 (22.8)	-	180(100%)

DISCUSSIONS

Table 2 delineates the histopathological patterns of the endometrium in patients with abnormal uterine bleeding (AUB). A significant finding is the high prevalence of the proliferative phase, seen in 36.1% of the cases. This result aligns with the study by Özdemir *et al.*[4] where they observed that the proliferative phase was the most common endometrial pattern in patients presenting with AUB, reflecting its physiological dominance in the menstrual cycle. Interestingly, our study notes simple atypical hyperplasia in 22.2% of the cases. This is markedly higher than findings from the research conducted by Khan *et al.*[5] which recorded a prevalence rate of 12%. The disparity might be attributed to differences in sample demographics or clinical presentation.

Chronic endometritis and disordered proliferative endometrium were less frequently observed, making up only 2.8% and 1.7% of the cases, respectively. Similar low prevalence rates for these patterns were reported by Khan *et al.*[6].

Notably, malignancies like low-grade endometrial stromal sarcoma, papillary endometrial carcinoma and well-differentiated adenocarcinoma of the endometrium were found in very low proportions, echoing findings from Abdullah *et al.*[7] that malignancies are relatively rare in AUB patients without other high-risk factors.

Endometrial polyps and the secretory phase patterns constituted 3.9% and 8.9% of the cases, respectively, which are consistent with the findings by Singh *et al.*[8].

The presence of retained product of conception in 6.7% of our cases is intriguing and warrants a comparison with other larger cohort studies to ascertain its true prevalence in AUB patients.

Table 3 delineates the intricate relationship between various histopathological patterns observed in the endometrium and the clinical manifestations or severity of abnormal uterine bleeding (AUB).

The proliferative phase the most common histopathological pattern observed at 36.1% of the cases, exhibited a predominant association with severe AUB (16.7%). This observation aligns with a study by Dadhania *et al.*[9] which found a significant correlation between an extended proliferative phase and intensified menstrual bleeding, potentially due to unsynchronized endometrial proliferation. On the other hand, simple atypical hyperplasia, the second most common pattern at 22.2%, predominantly manifested in moderate AUB at 12.2%. This observation is crucial given the potential of atypical hyperplasia to progress into endometrial carcinoma. A study by Kannar *et al.*[10] postulated that the abnormal glandular proliferation seen in simple atypical hyperplasia could result in irregular and occasionally heavier bleeding patterns, underlining the significance of early detection. Lastly, chronic endometritis accounted for 2.8% of the total cases, with a more common presentation in mild AUB. This corroborates the findings by Behera *et al.*[11] who observed that chronic inflammation, typically a result of persistent infections or non-infectious inflammatory conditions, often causes milder, sporadic bleeding.

CONCLUSION

The study offers significant insights into the underlying causes and potential therapeutic avenues for managing AUB. A thorough understanding of the endometrial histopathological patterns is paramount, as significant percentage of malignancy are there which directly correlates with the clinical presentation and further managment of patient, which prevent potential complications, ultimately leading to improved patient outcomes and care. Future studies should continue to explore the intricate relationships between histopathology, clinical presentation and potential therapeutic strategies to further patient care.

Limitations of study

Retrospective design: Given that the study is retrospective in nature the data relies on previously recorded information. This might lead to missing data or inconsistencies in the way data was initially recorded.

Sample size: Although a sample size of 180 can be considered substantial for some research purposes, larger cohorts might provide a more comprehensive view of the histopathological patterns and their correlation with clinical presentations.

Single-center study: Data collected from one institution might not be representative of broader populations. The findings might be influenced by the specific patient demographics, treatment approaches, and diagnostic modalities of that institution.

Subjectivity in histopathological interpretation: Histopathological evaluations can sometimes be subject to inter-observer variability, which could introduce a degree of bias or inconsistency.

Lack of clinical data: Comprehensive clinical histories and detailed presentations of each patient might not always be available, leading to potential gaps in correlating clinical presentations with histopathological findings.

Potential confounding variables: Factors such as age, hormonal status, coexisting gynecological conditions or previous treatments could influence the endometrial histopathology. The study might not have accounted for all these variables, which could affect the conclusions.

Absence of longitudinal follow-up: Without a follow-up mechanism, it is challenging to determine the long-term implications of the identified histopathological patterns or to observe any changes in patterns over time.

Generalizability: Due to the specific demographic and clinical characteristics of the study population the findings might not be universally applicable to other settings or populations.

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