RESEARCH PAPER

Histopathological Spectrum of Endometrial Lesions in Women Presenting with Abnormal Uterine Bleeding: A Cross-Sectional Study

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ABSTRACT

Background:

Abnormal uterine bleeding is a common reason for gynaecological evaluation and may reflect a range of underlying endometrial changes. Histopathological examination remains a simple and reliable way to identify these patterns.

Objective:

To assess the spectrum of endometrial findings in abnormal uterine bleeding patients and their distribution across age groups and menopausal status.

Materials and Methods:

This cross-sectional study was conducted over two years in a tertiary care centre. One hundred endometrial samples from women presenting with abnormal uterine bleeding were examined. Clinical details were obtained from records. Specimens were processed and stained with hematoxylin and eosin, and findings were recorded and expressed as frequencies and percentages.

Results:

Most patients were aged 41–50 years, and menorrhagia was the commonest symptom. Endometrium in the proliferative phase was the most frequent finding, followed by disordered proliferative and secretory patterns. Hyperplasia without atypia was more common than atypical hyperplasia, while carcinoma was seen in a small number of cases. Premalignant and malignant lesions were more frequent in women above 40 years.

Conclusion:

Endometrial patterns vary with age. Functional changes are more common in younger women, while hyperplasia and malignancy are seen more often in older age groups. Histopathological evaluation remains essential for diagnosis.

Keywords: Abnormal Uterine Bleeding, Endometrium, Histopathology, Endometrial Hyperplasia, Endometrial Carcinoma, Biopsy

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INTRODUCTION

Abnormal uterine bleeding(AUB) is a frequent reason for women to seek gynaecological care across all age groups. It can significantly interfere with daily life and often prompts further evaluation to identify the underlying cause. The reasons for abnormal bleeding are varied, ranging from hormonal disturbances to structural and more serious endometrial conditions. Because clinical features alone are often insufficient to determine the cause, endometrial tissue examination is important for establishing the diagnosis and guiding management.[1]

To bring consistency in how abnormal uterine bleeding is described, the FIGO system groups its causes into structural and non-structural categories. Polyps, adenomyosis, fibroids, and endometrial hyperplasia or malignancy are the structural causes, and non-structural causes include coagulation disorders, ovulatory dysfunction, endometrial factors, or treatment-related effects. Within this framework, endometrial causes form an important group in which tissue examination helps reach a diagnosis.[2]

The pattern of endometrial changes seen on histology often varies with a woman's age and hormonal status. In younger women, findings are usually cyclical, with proliferative and secretory patterns being most common. Around the perimenopausal period, irregular proliferation and hyperplastic changes are more frequently encountered, often related to anovulatory cycles. In postmenopausal women, the endometrium is typically atrophic, although the possibility of premalignant or malignant pathology should always be considered, especially when bleeding is present.[3]

Endometrial sampling by biopsy or curettage is a simple and reliable method for evaluating endometrial pathology.[4] Histopathological examination helps differentiate functional causes from organic lesions such as polyps, hyperplasia, inflammation, and carcinoma.

Earlier reports have consistently found proliferative and disordered proliferative patterns to be the most frequent findings, with hyperplasia and polyps seen less often. Malignant lesions, in contrast, tend to occur more commonly in peri- and postmenopausal women. These trends underline the value of routine histopathological assessment in cases of abnormal uterine bleeding.[5,6]

This study was carried out to examine the range of endometrial changes observed in abnormal uterine bleeding patients and to explore how these findings vary with age and menopausal status.

MATERIALS AND METHODS

Study Design and Setting

The study used a cross-sectional design and was conducted in the pathology department of a tertiary care hospital over a 2-year period, from January 2022 to December 2024.

Study Population

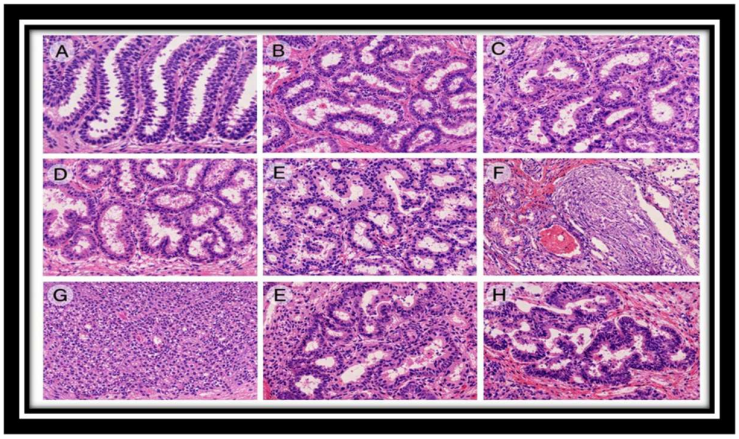
The study included women presenting with abnormal uterine bleeding who underwent endometrial sampling in the form of endometrial biopsy, dilatation and curettage, or hysterectomy specimens. Only cases with adequate tissue for examination were included. The selection of cases is shown in Figure 1.

Sample Size Calculation

The sample size was calculated using the prevalence of endometrial hyperplasia reported in a previous study by Shukla et al.[6] At 95% confidence level, with an expected prevalence of 13.5% and an absolute precision of 7%, the minimum required sample size was approximately 92 cases. To better represent histopathological patterns and maintain a round figure for analysis, 100 cases were analysed.

Inclusion and Exclusion Criteria

Women presenting with abnormal uterine bleeding who underwent endometrial sampling with adequate tissue were included. Samples that were scanty or inadequate, as well as cases related to pregnancy, gestational pathology, or known bleeding disorders, were excluded. Only one sample per patient was considered.



* Author's Illustration

Women with AUB assessed for study eligibility (n = 120)
↓
Endometrial samples received in pathology
↓
Excluded cases (n = 20)
Inadequate / scanty samples (n = 12)
Pregnancy-related lesions (n = 5)
Repeat samples (n = 3)
↓
Final study population included (n = 100)
↓
Histopathological examination performed
↓
Categorization into functional, benign, premalignant, and malignant lesions
↓
Statistical analysis performed

Data Collection

Clinical details were obtained from pathology requisition forms and relevant clinical records at the time of evaluation.

Information regarding age, presenting complaint, and menopausal status was recorded. Clinical presentation was classified as menorrhagia, metrorrhagia, polymenorrhea, and postmenopausal bleeding. Menopausal status was determined from clinical history.

Table 2. Clinical presentation of abnormal uterine bleeding

Clinical presentation	Cases	Percentage (%)
Menorrhagia	40	40
Metrorrhagia	25	25
Polymenorrhea	15	15
Postmenopausal bleeding	20	20
Total	**100**	**100**

Histopathological Evaluation

Specimens were fixed, processed routinely, and stained with hematoxylin and eosin. Slides were examined, and findings were classified into standard histological categories.

Objectives

To assess the spectrum of histological patterns in endometrial samples in women with AUB, and to evaluate their distribution by age and menopausal status.

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Outcome Measures

The primary outcome was the proportion of different histological patterns identified. Secondary outcomes included their distribution across age groups and menopausal status, as well as the frequency of premalignant and malignant lesions.

Statistical Analysis

The collected data were entered into Microsoft Excel and analysed using SPSS software. The data were analysed using descriptive statistics.

Results

Age Distribution

Table 1. Age distribution of women in the study

Age group (years)	Cases	Percentage (%)
21–30	10	10
31–40	20	20
41–50	35	35
51–60	25	25
>60	10	10
Total	**100**	**100**

Endometrial samples from women with AUB were included in the study (Figure 2). The majority belonged to the 41–50 years age group. Women aged 51–60 years accounted for 25% of cases, followed by those aged 31–40 years (20%). Patients aged 21–30 years and those aged 60 years and above accounted for 10% each (Table 1).

Clinical Presentation

Menorrhagia was observed in 40% of cases. Metrorrhagia was seen in 25% of patients, followed by postmenopausal bleeding in 20% and polymenorrhea in 15% of cases (Table 2).

Histopathological Spectrum

Table 3. Various endometrial lesions in AUB (n = 100)

Histopathological diagnosis	Number of cases	Percentage (%)
Proliferative phase endometrium	20	20
Secretory phase endometrium	15	15
Disordered proliferative pattern	18	18
Non-atypical endometrial hyperplasia	12	12
Atypical Endometrial Hyperplasia	5	5
Polyp	10	10
Chronic endometritis	5	5
Atrophic endometrium	10	10
Endometrial carcinoma	5	5

Total	**100**	**100**

Histopathological examination showed proliferative changes as the most common finding, seen in 20% of cases. Disordered proliferative changes were seen in 18% of cases, whereas secretory patterns were noted in 15%. Endometrial hyperplasia without atypia was noted in 12% of cases, and hyperplasia with atypia in 5%. Endometrial polyps and atrophic endometrium were each seen in 10% of cases. Chronic endometritis and endometrial carcinoma were observed in 5% of cases each (Table 3). The distribution of histopathological patterns varied across diagnostic categories. Representative histopathological patterns are shown in Figure 2.

Figure 2: Representative histopathological patterns of endometrium in AUB cases (H&E stain). (A) Proliferative endometrium with tubular glands lined by pseudostratified columnar cells. (B) Secretory endometrium showing tortuous glands with luminal secretions. (C) Disordered proliferative endometrium with irregular glandular architecture. (D) Hyperplasia without atypia showing an increased gland-to-stroma ratio.

(E) Atypical hyperplasia with crowded glands and cytological atypia. (F) Endometrial polyp showing fibrous stroma with thick-walled blood vessels. (G) Chronic endometritis showing stromal plasma cell infiltration. (H) Endometrial carcinoma showing atypical glands with stromal invasion.

*** Author's Illustration**

Proliferative and secretory patterns were more commonly seen in women below 40 years of age. The perimenopausal age group had more of disordered proliferative endometrium and endometrial hyperplasia pattern. Atrophic endometrium and endometrial carcinoma were predominantly seen in women above 50 years (Table 4). A clear variation in histopathological patterns was observed across different age groups.

Table 4: Age-wise distribution of histopathological findings in abnormal uterine bleeding (n = 100)

Histopathological finding	<40 years	41–50 years	>50 years	Total
Proliferative phase endometrium	12	6	2	20
Secretory phase endometrium	10	4	1	15
Disordered proliferative pattern	3	10	5	18
Endometrial hyperplasia without atypia	0	7	5	12
Endometrial hyperplasia with atypia	0	3	2	5
Endometrial polyp	2	4	4	10
Chronic endometritis	2	2	1	5
Atrophic endometrium	0	1	9	10
Endometrial carcinoma	0	2	3	5
Total	**29**	**39**	**32**	**100**

Distribution according to menopausal status

Table 5. Distribution of histopathological findings according to menopausal status (n = 100)

Histopathological finding	Premenopausal (n = 65)	Postmenopausal (n = 35)	Total (n = 100)
Proliferative endometrium	18	2	20
Secretory endometrium	14	1	15
Disordered proliferative	14	4	18
Hyperplasia without atypia	8	4	12
Hyperplasia with atypia	2	3	5
Endometrial polyp	7	3	10
Chronic endometritis	4	1	5
Atrophic endometrium	0	10	10
Endometrial carcinoma	0	5	5
Total	**65**	**35**	**100**

Endometrial lesions showed a distinct variation with menopausal status (Table 5). Functional endometrial patterns, including proliferative and secretory endometrium, were predominantly observed in premenopausal women. In contrast, atrophic

endometrium and endometrial carcinoma were exclusively or predominantly seen in postmenopausal women. Premalignant lesions such as non-atypical endometrial hyperplasia were also more frequent in the postmenopausal group. A distinct variation in histopathological patterns was observed according to menopausal status.

Discussion

Most women in this study were in the 41–50-year age group. A similar pattern has been noted in earlier studies. This preponderance may be related to hormonal fluctuations and anovulatory cycles during the menopausal transition.[7–9]

Menorrhagia was the most frequent presenting complaint in the present series, which is consistent with previous studies.[7,9,10]

On histological examination, proliferative endometrium was the most common pattern, followed by disordered proliferative and secretory changes. Similar trends have been described in earlier studies, in which functional endometrial patterns constitute a substantial proportion of findings. These changes are often associated with hormonal imbalance, particularly in the setting of irregular ovulation.[7,10,12]

Disordered proliferative endometrium constituted a significant proportion of cases and was predominantly observed in the perimenopausal age group in this study. This pattern reflects prolonged estrogenic stimulation without ovulation and is considered an intermediate stage between proliferative endometrium and hyperplasia. Comparable observations have been reported in earlier studies evaluating histopathological patterns in abnormal uterine bleeding.[9,11,12]

Endometrial hyperplasia was observed in a subset of patients, with hyperplasia without atypia being more common than atypical hyperplasia. This distribution is similar to previous studies where non-atypical hyperplasia predominated.[7,10] Identification of atypical hyperplasia is clinically important because of its association with progression to endometrial carcinoma.[12,13]

Benign lesions such as an endometrial polyp and chronic endometritis were also identified. Endometrial polyps have a variable frequency in different studies as a structural cause of abnormal uterine bleeding.[8,11] Chronic endometritis constituted a smaller proportion of cases, similar to previously reported findings.[7,10]

Atrophic endometrium was predominantly observed in older women and was commonly associated with postmenopausal bleeding. Although an atrophied endometrium is a benign finding, evaluation is essential because postmenopausal bleeding may also indicate malignancy. Previous studies have reported atrophic endometrium as a common histopathological finding in postmenopausal women presenting with abnormal uterine bleeding.[9,11,12]

Endometrial carcinoma accounted for a small proportion of cases and was mainly observed in women above 50 years of age. The incidence of malignancy increases with advancing age, particularly in post-menopausal women. Several studies have demonstrated a higher prevalence of carcinoma in older age groups, highlighting the importance of endometrial sampling in these patients.[10,12,13]

Age-wise distribution of histopathological findings showed that functional endometrial patterns were more common in younger women, whereas hyperplasia, atrophic endometrium, and carcinoma were more common in older age groups. Similar age-related trends have been reported in studies which also evaluated histopathological patterns in abnormal uterine bleeding.[8,11,12]

Strengths

This study provides a comprehensive evaluation of histopathological patterns in abnormal uterine bleeding across a wide age range. Inclusion of both reproductive and postmenopausal women allowed comparison of age-related endometrial changes. A standardized histopathological classification was used, which enabled clear categorization of all the lesions. Evaluation of patterns across age groups also helped in identifying clinically significant trends. Using an adequate sample size further improves the reliability of the observations.

Limitations

The study was limited by its cross-sectional design and reliance on available clinical records. Detailed clinical parameters such as parity, hormonal therapy, and imaging findings were not uniformly available for all patients. Follow-up data were not included, and therefore, progression of hyperplasia or clinical outcomes could not be assessed.

Future studies with a larger sample size and a prospective design would help in better understanding the clinicopathological correlation in abnormal uterine bleeding. Inclusion of clinical variables such as hormonal status, BMI and imaging findings may improve diagnostic accuracy. Long-term follow-up of patients with hyperplastic changes would help assess progression to carcinoma. Multi-centre studies may also provide better representation of population-based histopathological patterns.

Conclusion

Abnormal uterine bleeding is associated with a wide spectrum of endometrial changes ranging from functional patterns to premalignant and malignant lesions. Functional endometrial changes were the most common findings, particularly in reproductive and perimenopausal women. Endometrial carcinoma and hyperplastic changes were more frequently observed in older age groups. Histological assessment of endometrial samples is central to the evaluation of abnormal uterine bleeding, enabling early identification of premalignant and malignant changes and informing clinical management.

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