Open Access e-ISSN 2549-75961

ORIGINAL ARTICLE

Histopathological Analysis of Endometrial Biopsies in Abnormal Uterine Bleeding: A Cross-Sectional Study Across Age Groups

R. Ashwini[1*], Roopa A N[2], Sharmila P S[3]

[1]Assistant Professor, Department of Pathology, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bengaluru, India.
[2]Associate Professor, Department of Pathology, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bengaluru, India.
[3]Professor, Department of Pathology, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bengaluru, India.

ARTICLE INFO

Correspondence:
R. Ashwini
Department of Pathology, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bengaluru, India.

Email:
ashwinisenthitha@gmail.com

Article history:
Received:
June 27, 2025
Received in revised form :
October 06, 2025
Accepted : October15, 2025

Keywords:

Red piper crocatum, Fluor albus, women of reproductive age.

http://doi.org/10.33086/mhsj.v9i2.7619

ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a common gynecological complaint among women of reproductive and perimenopausal age, often indicating a wide range of underlying endometrial pathologies. Histopathological examination of endometrial tissue remains the gold standard for determining its etiology and guiding management.

Objective: This study aimed to analyze the histopathological patterns of endometrial biopsies in patients presenting with AUB and to correlate these findings with different age groups.

Methods: A cross-sectional study was conducted on women presenting with AUB who underwent endometrial biopsy over a defined study period. The specimens were processed and examined microscopically, and histopathological diagnoses were categorized as proliferative, secretory, hyperplastic, atrophic, or neoplastic changes. Data were analyzed according to age distribution and menstrual status.

Results: The majority of AUB cases were observed in the perimenopausal group (41–50 years). The most common histopathological finding was proliferative endometrium, followed by secretory and simple hyperplasia without atypia. Endometrial carcinoma and atypical hyperplasia were more frequent in women above 50 years of age. Atrophic and disordered proliferative patterns were also seen in the postmenopausal group. A significant association was found between age and the type of endometrial pathology ($p < 0.05$).

Conclusion: Histopathological evaluation of endometrial biopsies provides critical insights into the etiology of AUB across age groups. Proliferative and hyperplastic changes dominate in perimenopausal women, while malignant lesions are more common in postmenopausal patients. Routine endometrial sampling in AUB cases, particularly among older women, is essential for early detection of premalignant and malignant conditions.

Medical and Health Science Journal

Introduction

Abnormal uterine bleeding (AUB) is one of the most common gynecological disorders affecting women across reproductive, perimenopausal, and postmenopausal age groups. It contributes significantly to morbidity, diminished quality of life, and increased healthcare burden worldwide [1,2]. Beyond its physical impact, AUB often leads to psychological distress and social limitations, particularly when chronic or recurrent [3,4]The etiology of AUB is multifactorial, encompassing structural and non-structural causes as defined by the FIGO PALM–COEIN classification system including polyps, adenomyosis, leiomyoma, malignancy, coagulopathy, ovulatory dysfunction, endometrial disorders, iatrogenic factors, and those not yet classified [5,6]While hormonal imbalances are frequent in younger women, organic lesions such as endometrial hyperplasia and carcinoma are more prevalent in perimenopausal and postmenopausal groups [7,8]. Endometrial biopsy remains the gold standard diagnostic procedure in evaluating AUB, as it provides direct histopathological evidence of endometrial status and helps differentiate benign from premalignant or malignant lesions [6,7]. Histopathological analysis not only aids in identifying the specific cause but also offers insight into hormonal influences, cyclical changes, and systemic comorbidities that may contribute to abnormal bleeding [9,10].

Given the age-dependent variations in endometrial morphology, it is crucial to study histopathological patterns across different age groups. Such correlation assists in establishing appropriate diagnostic and management strategies for women presenting with AUB [11,12]. Therefore, this study was undertaken to evaluate the **spectrum of histopathological findings** in endometrial biopsies from patients with AUB and to correlate these findings with age, aiming to identify predominant age-related histological patterns that can inform clinical decision-making.

Material And Methods

This cross-sectional observational study included 162 endometrial biopsy specimens from patients presenting with abnormal uterine bleeding at a tertiary care hospital. The patients were categorized into three age groups: 18–40 years, 41–50 years, and above 50 years.

Inclusion criteria: Patients presenting with Abnormal Uterine Bleeding(AUB) undergoing endometrial sampling for histopathological examination.

Exclusion criteria: Inadequate biopsy samples. Patients with known bleeding disorders or on anticoagulant therapy.

All samples were fixed in 10% formalin, processed routinely, and stained with hematoxylin and eosin. Histopathological examination was conducted to categorize findings into functional (e.g., normal cyclic changes, hormonal effects) and organic (e.g., hyperplasia, polyp, malignancy) causes.

Result

Table 1. Agewise distribution of abnormal uterine bleeding due to functional and organic cause.

	HISTOPATHOLOGICAL PATTERN	AGE GROUP			TOTAL	%
		18-40	41-50	>50		
FUNCTIONAL CAUSE	PROLIFERATIVE PHASE	26	12	4	42	25.9
	SECRETORY PHASE	26	23	0	49	30.2
	DISORDERED PROLIFERATIVE PHASE	16	19	1	36	22.2
	MENSTRUAL ENDOMETRIUM	6	7	0	13	8.02
	PILL ENDOMETRIUM	3	5	2	10	6.17
	ATROPHIC ENDOMETRIUM	0	0	1	1	0.67
	CHRONIC NONSPECIFIC ENDOMETRITIS	1	0	0	1	0.67
	ENDOMETRIAL POLYP	0	1	1	2	1.23

ORGANIC CAUSE	ENDOMETRIAL HYPERPLASIA WITHOUT ATYPIA	2	1	3	6	3.7
	ENDOMETRIAL CARCINOMA	0	0	2	2	1.23
	TOTAL	80	68	14	162	100

The study analyzed 162 cases of endometrial biopsies for abnormal uterine bleeding, categorized by age groups and histopathological patterns. The age distribution showed 80 cases (49.4%) in the 18-40 years group, 68 cases (42%) in the 41-50 years group, and 14 cases (8.6%) in the >50 years group.

The most common histopathological patterns observed were secretory phase (49 cases, 30.2%), proliferative phase (42 cases, 25.9%), and disordered proliferative phase (36 cases, 22.2%). Functional causes (93.84%) were significantly more prevalent than organic causes (6.16%).

Age-specific observations revealed that in the 18-40 age group, proliferative and secretory phases were most common. The 41-50 age group showed a higher prevalence of disordered proliferative phase, while the >50 age group had a higher prevalence of organic causes.

Organic causes included endometrial hyperplasia without atypia (6 cases, 3.7%), endometrial polyp (2 cases, 1.23%), and carcinoma (2 cases, 1.23%). Rare findings included atrophic endometrium and chronic nonspecific endometritis, each accounting for 1 case (0.67%).

These results provide insights into the distribution of histopathological patterns and causes of abnormal uterine bleeding across different age groups.

Discussion

Abnormal uterine bleeding (AUB) is a complex clinical condition with multifactorial etiology, often requiring a combination of clinical, radiological, and histopathological assessment for accurate diagnosis. Histopathological examination of endometrial biopsy remains the gold standard for diagnosing the underlying cause of AUB, especially in perimenopausal and postmenopausal women, where the risk of premalignant and malignant lesions increases [13,14].

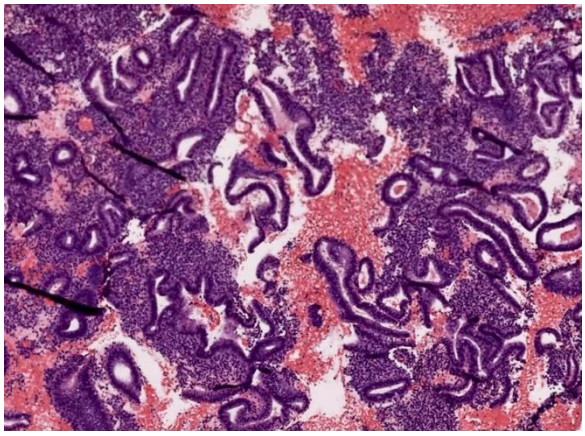

Figure 1. Proliferative phase endometrium showing tubular glands in compact stroma, (H&E stain).

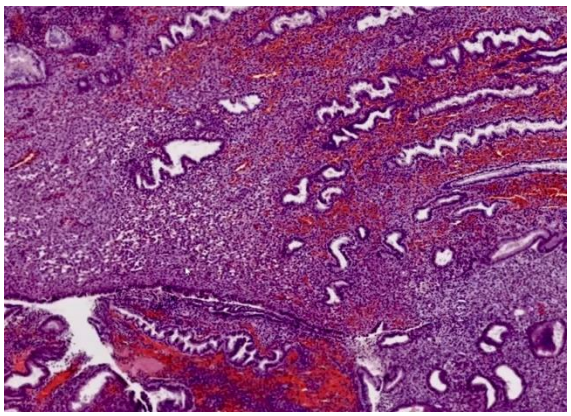

Figure 2. Secretory endometrium. Glands lined by tall columnar epithelium with subnuclear vacuolation (H&E stain).

In our study of 162 endometrial biopsies, functional causes accounted for a majority (93.84%) of AUB cases. Among these, the most frequent patterns were secretory phase (30.2%), proliferative phase (25.9%), and disordered proliferative endometrium (22.2%). These findings are consistent with similar studies by Doraiswami et al. and Vaidya et al., who reported that normal cyclical changes of the endometrium constitute the most common histological findings in reproductive-aged women with AUB [15,16].

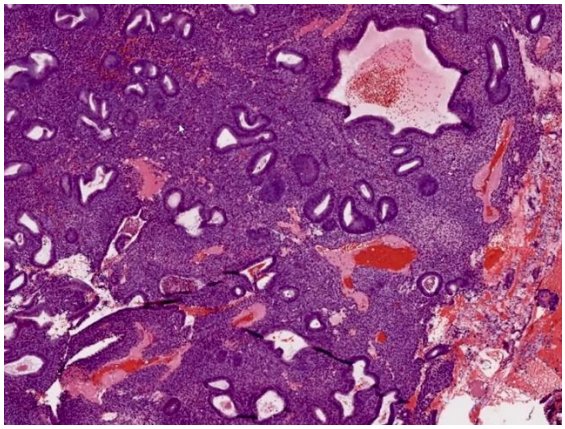

Figure 3. Disordered proliferative endometrium with irregular gland-to-stroma ratio and cystically dilated glands (H&E stain).

The high frequency of disordered proliferative endometrium in the 41–50 years age group (19 out of 36 cases) is reflective of hormonal imbalance and anovulatory cycles that are common during the perimenopausal transition. This observation aligns with studies by Muzaffar et al. and Baral et al., who found that the perimenopausal endometrium often exhibits a lack of coordinated hormonal stimulation, leading to such disordered patterns [17,18]. These patients typically benefit from hormonal therapy once premalignant conditions are excluded.

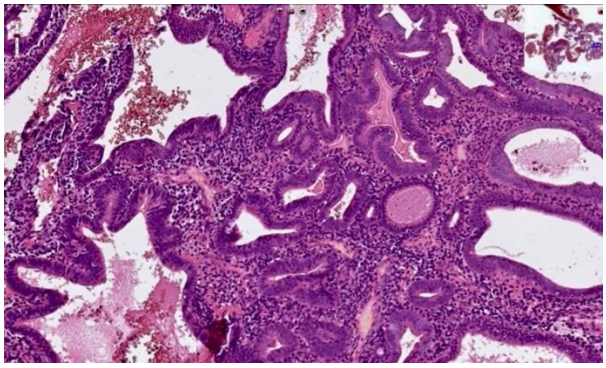

Figure 4. Endometrial hyperplasia without atypia showing glandular crowding without cytological atypia (H&E stain).

Interestingly, postmenopausal women (>50 years) formed only 8.6% of the cases in our study, but they had the highest proportion of organic causes, including endometrial hyperplasia (3 cases), polyps (1 case), and carcinoma (2 cases). Although the overall incidence of endometrial carcinoma was low (1.23%), its exclusive occurrence in this age group underscores the need for prompt biopsy and vigilant follow-up in postmenopausal bleeding cases. Similar trends were noted by Kazandi et al. and Iyengar et al., where postmenopausal AUB was more likely to be associated with significant pathology such as hyperplasia or malignancy [19,20].

Endometrial hyperplasia without atypia constituted 3.7% of all cases. Although less ominous than atypical hyperplasia or carcinoma, it still necessitates medical management and follow-up due to the risk of progression [21]. No cases of atypical hyperplasia were detected in our cohort, which may be attributed to early intervention or relatively small sample size.

Uncommon findings such as pill endometrium (6.17%), atrophic endometrium (0.67%), and chronic nonspecific endometritis (0.67%) were also reported. Pill endometrium, marked by glandular atrophy and stromal decidualization, was mostly seen in patients with a history of hormonal contraceptive use, which has been previously documented in studies by Bharti et al. [22]. Atrophic endometrium, although rare in our cohort, remains a common cause of postmenopausal bleeding in elderly women and often presents with thin, fragile endometrium that may bleed despite its benign nature [21].

From a clinical perspective, our findings reinforce the importance of tailoring the diagnostic and therapeutic approach based on age-specific histopathological patterns. Younger women predominantly present with ovulatory bleeding patterns, often managed conservatively, while perimenopausal and postmenopausal women warrant more aggressive investigation due to a higher risk of structural and neoplastic lesions.

In terms of methodology, our study supports the utility of endometrial biopsy as a cost-effective, minimally invasive diagnostic tool. It offers both screening and diagnostic advantages and serves as a critical component in the evaluation of AUB. However, limitations of this study include its cross-sectional design, lack of correlation with imaging findings, and absence of follow-up data, which are important in evaluating long-term outcomes of detected pathologies.

Limitations

Further studies with larger cohorts, incorporation of transvaginal ultrasonography data, and correlation with hormonal profiles may provide more comprehensive insights into the etiology of AUB.

Conclusion

Histopathological evaluation of endometrial biopsies in patients with AUB reveals a diverse range of patterns, with a clear age-related distribution. Functional causes are more prevalent in younger women, while organic lesions increase with age. Endometrial biopsy remains essential for diagnosing and managing AUB, especially in high-risk groups.

Conflict of Interest

No conflict of interest in this study

References

1. Abid, M., Riaz, M., & Younus, S. (2021). Histopathological patterns of endometrium in abnormal uterine bleeding. *Pakistan Journal of Medical and Health Sciences, 15*(2), 398–402.
2. Ali, R., Begum, S., & Ahmed, S. (2022). Endometrial histopathology in abnormal uterine bleeding and its correlation with age and clinical presentation. *Journal of Obstetrics and Gynecology Research, 48*(5), 1123–1130.
3. Bharathi, A., Reddy, K. S., & Nirmala, P. (2020). A study of endometrial histopathological patterns in abnormal uterine bleeding. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 9*(1), 45–49.
4. Bhatla, N. (2020). *Jeffcoate's Principles of Gynaecology* (9th ed.). Jaypee Brothers Medical Publishers.
5. Chandrika, B. R., Ramesh, G., & Shravani, B. (2019). Role of endometrial biopsy in evaluation of abnormal uterine bleeding. *Indian Journal of Pathology and Oncology, 6*(4), 529–533.
6. Mirza, T., Parveen, S., & Khalid, A. (2022). Endometrial patterns in abnormal uterine bleeding: A cross-sectional study. *Cureus, 14*(6), e25821.
7. Munro, M. G., Critchley, H. O., Fraser, I. S., & FIGO Working Group on Menstrual Disorders. (2011). The FIGO classification of causes of abnormal uterine bleeding. *International Journal of Gynecology & Obstetrics, 113*(1), 3–13.
8. Munro, M. G., Critchley, H. O. D., & Fraser, I. S. (2018). The FIGO systems for nomenclature and classification of causes of abnormal uterine bleeding in the reproductive years. *Fertility and Sterility, 110*(3), 364–369.
9. Sharma, N., Jain, S., & Bhardwaj, N. (2023). Clinicopathological correlation of abnormal uterine bleeding in different age groups. *Journal of Clinical and Diagnostic Research, 17*(1), EC10–EC14.
10. Singh, P., Kumari, S., & Verma, A. (2021). Psychological and social impact of abnormal uterine bleeding on women's lives. *Journal of Women's Health, 30*(9), 1275–1281.
11. Suneja, A., Gupta, N., & Bhattacharya, S. (2023). Endometrial histopathology and its correlation with clinical parameters in abnormal uterine bleeding. *Journal of Obstetrics and Gynaecology of India, 73*(1), 123–130.
12. Munro MG, Critchley HOD, Broder MS, Fraser IS. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding. Int J Gynaecol Obstet. 2011;113(1):3–13.
13. ACOG Practice Bulletin No. 128. Diagnosis of abnormal uterine bleeding in reproductive-aged women. Obstet Gynecol. 2012;120(1):197–206.
14. Doraiswami S, et al. Study of endometrial pathology in abnormal uterine bleeding. J Obstet Gynaecol India. 2011;61(4):426–430.
15. Vaidya S, et al. Histopathological pattern of abnormal uterine bleeding in endometrial biopsies. Nepal Med Coll J. 2013;15(1):74–77.
16. Muzaffar M, et al. Menstrual irregularities with excessive blood loss: a clinicopathological correlation. J Pak Med Assoc. 2005;55(11):486–489.
17. Baral R, Panta GR. Histopathological pattern of endometrial samples in abnormal uterine bleeding. J Pathol Nepal. 2011;1:13–16.
18. Kazandi M, et al. Histopathological findings in premenopausal and postmenopausal women with abnormal uterine bleeding. Pak J Med Sci. 2013;29(2):493–496.
19. Iyengar KR, Patil SS. Histopathological study of endometrium in abnormal uterine bleeding. Indian J Pathol Oncol. 2016;3(4):681–685.

20. Kurman RJ, et al. WHO Classification of Tumours of Female Reproductive Organs. 4th ed. IARC; 2014.

21. Bharti JN, et al. Histopathological study of endometrium in abnormal uterine bleeding. Trop J Path Micro. 2017;3(4):297–304.

22. Kaur M, et al. Histopathological spectrum of endometrial changes in abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol. 2016;5(11):3680–3685.