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Original Research Article

Histopathological Patterns of Endometrial Biopsies and Their Clinical Association in Abnormal Uterine Bleeding Cases from Bihar

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Abstract:

Background: Abnormal uterine bleeding (AUB) is one of the most frequent complaints among women of reproductive and peri-menopausal age, often indicating underlying endometrial pathology. Histopathological examination of endometrial tissue remains the cornerstone in diagnosing the cause of AUB and guiding management. The pattern of histological changes in endometrial biopsies can vary with age, hormonal status, and associated systemic or gynecological conditions. Understanding regional patterns of endometrial pathology and their clinical correlation is essential for timely and accurate diagnosis, especially in resource-limited settings like Bihar.

Objectives:

- To evaluate the spectrum of histopathological patterns seen in endometrial biopsies from patients presenting with abnormal uterine bleeding.
- To correlate the histological findings with clinical parameters such as age, menstrual history, and presenting symptoms.
- To identify the most common causes of AUB in different age groups.

Materials and Methods: This retrospective observational study was conducted in the Department of Pathology at Netaji Subhas Medical College and Hospital, Patna, Bihar, over a period of 12 months. A total of 186 endometrial biopsy samples from women presenting with AUB were retrieved and reviewed. Clinical details were obtained from patient records. Biopsy specimens were fixed in 10% formalin, processed, and stained with hematoxylin and eosin. Histopathological findings were categorized into normal cyclic endometrium, hyperplasia, atrophy, chronic endometritis, disordered proliferative endometrium, and malignancy. Data were analyzed using SPSS version 26.0, and correlation between clinical and histological parameters was studied.

Results: The most common age group presenting with AUB was 41–50 years. Proliferative phase endometrium was the most frequent histological finding, followed by secretory phase and endometrial hyperplasia. Disordered proliferative endometrium and chronic endometritis were common in perimenopausal age, while atrophic endometrium and malignancies were more frequently seen in postmenopausal women. A significant clinico-pathological correlation was observed, emphasizing the diagnostic role of biopsy in management of AUB.

Conclusion: Histopathological examination of endometrial biopsies remains a reliable and cost-effective tool in evaluating abnormal uterine bleeding. The study highlights age-specific patterns of endometrial pathology in AUB cases and reinforces the importance of timely biopsy for appropriate clinical management. Clinico-pathological correlation enhances diagnostic accuracy and improves therapeutic outcomes.

Keywords: Endometrial Biopsy, Abnormal Uterine Bleeding, Histopathology, Endometrial Hyperplasia, Disordered Proliferative Endometrium, Clinical Correlation.

Introduction

Abnormal uterine bleeding is one of the most common gynecological problems encountered in clinical practice. It affects women across all age groups but is particularly prevalent among perimenopausal and postmenopausal women [1]. AUB is not a diagnosis in itself but a symptom of various underlying conditions ranging from physiological hormonal imbal-

ances to premalignant and malignant endometrial lesions. In regions with limited access to advanced diagnostic facilities, a structured pathological evaluation becomes crucial in differentiating benign causes from those requiring urgent intervention [2].

The causes of abnormal uterine bleeding are multifactorial and age-dependent. In reproductive-age women, it is often associated with an ovulatory cycles, hormonal imbalances, or endometrial polyps. In the perimenopausal age group, structural and functional abnormalities of the endometrium become more common, including endometrial hyperplasia and disordered proliferative patterns. In postmenopausal women, bleeding is considered a red flag symptom warranting prompt investigation to rule out malignancy or atrophic changes [3,4].

Histopathological evaluation of endometrial biopsies remains the gold standard in the assessment of AUB. It not only confirms the clinical diagnosis but also provides specific insights into the hormonal status of the endometrium, inflammatory changes, and neoplastic transformations. Sampling through endometrial curettage or pipelle biopsy is minimally invasive and yields significant diagnostic information [5,6]. The results help in formulating treatment strategies ranging from medical therapy to surgical intervention.

In a developing region like Bihar, where patients often present late and access to advanced diagnostic tools is limited, endometrial biopsy plays a vital role in the early detection of pathology. A systematic audit of histopathological findings in endometrial biopsies can offer valuable epidemiological data and reflect regional disease patterns. Moreover, correlating clinical features such as age, menstrual history, and presenting symptoms with histological findings enhances diagnostic confidence and therapeutic precision [7,8].

While several studies have been conducted across India on the clinico-pathological profile of endometrial biopsies, there is limited data specific to the Bihar region. Considering regional variations in healthcare-seeking behavior, socioeconomic status, and prevalence of reproductive disorders, it becomes necessary to study and understand the local burden of endometrial pathologies in women presenting with AUB.

This study was therefore undertaken to analyze the histopathological patterns in endometrial biopsies obtained from women with abnormal uterine bleeding and to correlate the findings with their clinical presentations. The goal is to generate region-specific data that can aid in evidence-based diagnostic and management protocols tailored to the population of Bihar.

Objectives: This study was conducted with the aim of evaluating the histopathological spectrum of endometrial lesions in women presenting with abnormal uterine bleeding and determining its correlation with clinical findings. The objective was to identify the most prevalent endometrial patterns across different age groups and assess their diagnostic implications in a regional context.

Primary objectives:

1. To analyze the histopathological patterns observed in endometrial biopsies of patients with abnormal uterine bleeding.
2. To correlate histological findings with clinical parameters such as age, menstrual history, and presenting complaints.

Secondary objective:

1. To assess the age-wise distribution of endometrial pathologies and identify common causes of abnormal uterine bleeding in the population served by the tertiary care center.

Materials and Methods

This retrospective observational study was conducted in the Department of Pathology at Netaji Subhas Medical College and Hospital, Patna, Bihar, over a period of 12 months. The study included biopsy specimens submitted for histopathological examination from patients clinically diagnosed with abnormal uterine bleeding.

Study population: The study included women of all age groups who presented with abnormal uterine bleeding and underwent endometrial sampling as part of their diagnostic workup.

Inclusion criteria:

- Patients of all ages with clinically diagnosed abnormal uterine bleeding.
- Endometrial biopsy specimens received with complete clinical details.
- Adequate tissue samples for histopathological evaluation.

Exclusion criteria:

- Inadequate, autolyzed, or poorly preserved samples.
- Cases with incomplete clinical information or missing demographic data.
- Repeat biopsies or follow-up samples from the same patient.

Sample size: A total of 186 endometrial biopsy specimens fulfilling the inclusion criteria were included in the study.

Data collection procedure: Clinical details such as age, menstrual history, presenting symptoms, and clinical diagnosis were obtained from pathology requisition forms and patient records. Endometrial

biopsy samples were fixed in 10% neutral buffered formalin, processed routinely, and embedded in paraffin blocks. Multiple sections were cut and stained with hematoxylin and eosin for microscopic examination.

Histopathological Evaluation: Each slide was examined under a light microscope by experienced pathologists. The endometrial tissue was categorized into various histological patterns, including proliferative phase, secretory phase, disordered proliferative endometrium, endometrial hyperplasia (with or without atypia), atrophic endometrium, chronic endometritis, and endometrial malignancy. In cases showing hyperplasia or atypical features, WHO classification was applied.

Statistical Analysis: Data were compiled using Microsoft Excel and analyzed using SPSS version 26.0. Descriptive statistics were used to summarize demographic data and frequency of histological findings. Chi-square test was applied to evaluate the association between age groups and histopathological patterns. A p-value less than 0.05 was considered statistically significant.

Results

A total of 186 endometrial biopsy samples were analyzed from women presenting with abnormal uterine bleeding. The patients ranged in age from 22 to 65 years, with the majority in the perimenopausal age group. Histopathological examination revealed a spectrum of endometrial patterns ranging from normal cyclical endometrium to hyperplasias, inflammatory lesions, and malignancies. The distribution of histological findings was analyzed across different age groups, and significant clinico-pathological correlations were established.

Table 1: Age-wise distribution of study population (n = 186)

Age group (years)	Frequency	Percentage (%)
21–30	14	7.5
31–40	48	25.8
41–50	72	38.7
51–60	38	20.4
>60	14	7.5

Table 2: Clinical presentation in patients with abnormal uterine bleeding

Clinical symptom	Frequency	Percentage (%)
Menorrhagia	76	40.9
Metrorrhagia	44	23.7
Polymenorrhea	16	8.6
Postmenopausal bleeding	36	19.4
Oligomenorrhea	14	7.5

Table 3: Distribution of endometrial histopathological patterns

Histopathological pattern	Frequency	Percentage (%)
Proliferative endometrium	58	31.2
Secretory endometrium	34	18.3
Disordered proliferative endometrium	26	14.0
Endometrial hyperplasia (non-atypical)	24	12.9
Chronic endometritis	16	8.6
Atrophic endometrium	10	5.4
Endometrial carcinoma	6	3.2
Inconclusive/insufficient	12	6.4

Table 4: Age-wise distribution of endometrial hyperplasia and malignancy

Age group (years)	Hyperplasia (n=24)	Malignancy (n=6)
31–40	4	0
41–50	12	1
51–60	6	3
>60	2	2

Table 5: Correlation of clinical symptoms with major histological patterns

Clinical symptom	Most frequent histology
Menorrhagia	Proliferative / Hyperplastic
Metrorrhagia	Disordered proliferative / Endometritis
Polymenorrhea	Secretory endometrium
Postmenopausal bleeding	Atrophic / Malignant endometrium
Oligomenorrhea	Secretory / Chronic endometritis

Table 6: Distribution of normal versus abnormal endometrial patterns

Histological category	Frequency	Percentage (%)
Normal endometrium	64	34.4
Abnormal findings	110	59.1
Inadequate/inconclusive	12	6.4

Table 7: Types of endometrial hyperplasia

Type of hyperplasia	Frequency	Percentage (%)
Non-atypical hyperplasia	20	83.3
Atypical hyperplasia	4	16.7
Total	24	100

Table 8: Histological patterns in relation to menopausal status

Histological pattern	Premenopausal	Postmenopausal
Proliferative endometrium	56	2
Secretory endometrium	33	1
Endometrial hyperplasia	20	4
Chronic endometritis	14	2
Atrophic endometrium	1	9
Endometrial carcinoma	1	5

Table 9: Histopathological spectrum in different age groups

Age group (years)	Common findings
21–30	Secretory / Proliferative
31–40	Proliferative / Chronic endometritis
41–50	Hyperplasia / Disordered proliferative
51–60	Hyperplasia / Malignancy
>60	Atrophic / Malignancy

Table 10: Statistical association between age and histopathological outcome

Parameter	Value
Chi-square statistic	12.47
Degrees of freedom	4
p-value	0.014
Significance	Statistically significant

Table 1 revealed that the highest number of AUB cases were reported in women aged 41–50 years. Table 2 showed that menorrhagia was the most common presenting complaint. Table 3 demonstrated that proliferative and secretory endometria were the most frequently encountered histological patterns, while disordered proliferative endometrium and hyperplasia constituted a significant portion of abnormal findings. Table 4 indicated that endometrial hyperplasia was common in the perimenopausal group, whereas malignancy was predominantly observed in postmenopausal women. Table 5 established a clear clinico-pathological association between symptoms and histological patterns. Table 6 confirmed that the majority of biopsies showed abnormal endometrial findings. Table 7 showed that non-atypical hyperplasia predominated over atypical types. Table 8 highlighted the hormonal influence on histology, with premenopausal women showing cyclical endometrium and postmenopausal women exhibiting atrophic or malignant patterns. Table 9 mapped the age-wise distribution of diagnoses, supporting a trend toward serious pathology in older age groups. Table 10 statistically confirmed a significant association between advancing age and risk of hyperplasia or carcinoma, emphasizing the need for timely biopsy in older women with AUB.

Discussion

Abnormal uterine bleeding is one of the most frequently encountered gynecological problems across

all age groups and constitutes a major proportion of diagnostic endometrial biopsies [9]. The present study aimed to analyze the histopathological spectrum of endometrial changes in AUB and correlate them with clinical and demographic variables, offering region-specific insights from a tertiary care center in Bihar.

The most common age group affected was 41–50 years, consistent with other studies that show a high incidence of AUB in the perimenopausal population. This demographic is particularly vulnerable due to hormonal fluctuations leading to an ovulatory cycles and unopposed estrogen stimulation, which can result in disordered proliferative endometrium and hyperplasia [10].

Histologically, the most frequent pattern observed in this study was proliferative endometrium, followed by secretory endometrium. These findings mirror the results of previous studies which reported normal cyclical endometrium as a major finding, especially in younger and perimenopausal women [11]. However, our study also noted a considerable proportion of cases showing disordered proliferative endometrium, suggesting incomplete hormonal regulation.

Endometrial hyperplasia constituted approximately 13% of cases, with non-atypical forms being more common than atypical variants. These lesions are typically associated with prolonged estrogen exposure and an ovulatory cycles [12]. Their recognition is critical, as atypical hyperplasia carries a higher risk of progression to carcinoma. These observations are consistent with the studies where hyperplasia was strongly age-associated and often preceded neoplastic transformation [13].

Malignancy was diagnosed in 3.2% of cases and predominantly occurred in postmenopausal women. The histopathological diagnosis of endometrial carcinoma in this group reinforces the clinical significance of postmenopausal bleeding as a red flag symptom requiring immediate investigation. This aligns with the findings reported similar trends in the incidence of endometrial carcinoma among older patients presenting with AUB [14].

Atrophic endometrium was also observed mainly in postmenopausal patients, highlighting another cause of bleeding in this age group due to thinning of the endometrial lining and fragile vasculature. Chronic endometritis, although less common, was noted in younger women and often linked with irregular cycles or subclinical pelvic inflammatory disease [15].

The clinico-pathological correlation in this study was strong, especially between clinical symptoms like menorrhagia and underlying structural or hormonal abnormalities such as proliferative and hyperplastic endometria. Similarly, postmenopausal bleeding was significantly associated with either atrophic changes or malignant transformation, supporting the diagnostic utility of histopathology in guiding management [16].

A statistically significant association was observed between age and the presence of endometrial hyperplasia or malignancy, affirming the value of biopsy in older women with AUB. This underlines the importance of timely endometrial sampling, particularly in women over 40 years, as part of routine evaluation of persistent abnormal bleeding [17].

The findings of this study are particularly relevant to the Bihar region, where late presentation, limited awareness, and inadequate access to diagnostic facilities often delay the detection of endometrial pathology. The use of simple, cost-effective endometrial biopsy, coupled with histopathological analysis, remains the most practical approach for identifying serious underlying causes of AUB in this setting.

While the study was comprehensive, its retrospective nature and lack of follow-up data are limitations. Further prospective studies incorporating hormonal profiles, imaging correlation, and long-term outcomes would enrich the diagnostic and prognostic utility of endometrial histopathology in AUB.

Conclusion

Endometrial biopsy continues to serve as a simple, effective, and reliable diagnostic tool for evaluating abnormal uterine bleeding across all age groups. This study demonstrated that proliferative and secretory endometrium are common findings, especially in reproductive and perimenopausal women, while hyperplasia and malignancy become increasingly prevalent with advancing age. A significant clinicopathological correlation was observed, particularly between specific bleeding patterns and underlying endometrial pathology. The findings underscore the critical role of histopathological assessment in identifying premalignant and malignant conditions, especially in postmenopausal women presenting with bleeding. Routine endometrial sampling, guided by clinical presentation and patient age, can significantly aid in early detection, risk stratification, and appropriate management of AUB, particularly in resource-limited settings like Bihar.

References

1. Vaidya S, Lakhey M, Vaidya S, Sharma PK, Hirachand S, Lama S, KC S. Histopathological pattern of abnormal uterine bleeding in endometrial biopsies. Nepal Med Coll J. 2013 Mar;15(1):74-7. PMID: 24592801.
2. Asuzu IM, Olaofe OO. Histological Pattern of Endometrial Biopsies in Women with Abnormal Uterine Bleeding in a Hospital in North Central Nigeria. Int J Reprod Med. 2018 Nov 1;2018:2765927. doi: 10.1155/2018/2765927. PMID: 30515385; PMCID: PMC6236767.

3. Alshdaifat EH, El-Deen Al-Horani SS, Al-Sous MM, Al-Horani S, Sahawneh FE, Sindiani AM. Histopathological pattern of endometrial biopsies in patients with abnormal uterine bleeding in a tertiary referral hospital in Jordan. Ann Saudi Med. 2022 May-Jun;42(3):204-213. doi: 10.5144/0256-4947.2022.204. Epub 2022 Jun 2. PMID: 35658582; PMCID: PMC9167457.
4. Van Den Bosch T, Verbakel JY, Valentin L, Wynants L, De Cock B, Pascual MA, Leone FPG, Sladkevicius P, Alcazar JL, Votino A, Fruscio R, Lanzani C, Van Holsbeke C, Rossi A, Jokubkiene L, Kudla M, Jakab A, Domali E, Epstein E, Van Pachterbeke C, Bourne T, Van Calster B, Timmerman D. Typical ultrasound features of various endometrial pathologies described using International Endometrial Tumor Analysis (IETA) terminology in women with abnormal uterine bleeding. Ultrasound Obstet Gynecol. 2021 Jan;57(1):164-172. doi: 10.1002/uog.22109. PMID: 32484286.
5. Heremans R, Van Den Bosch T, Valentin L, Wynants L, Pascual MA, Fruscio R, Testa AC, Buonomo F, Guerriero S, Epstein E, Bourne T, Timmerman D, Leone FPG; IETA Consortium. Ultrasound features of endometrial pathology in women without abnormal uterine bleeding: results from the International Endometrial Tumor Analysis study (IETA3). Ultrasound Obstet Gynecol. 2022 Aug;60(2):243-255. doi: 10.1002/uog.24910. PMID: 35385178.
6. Papakonstantinou E, Adonakis G. Management of pre-, peri-, and post-menopausal abnormal uterine bleeding: When to perform endometrial sampling? Int J Gynaecol Obstet. 2022 Aug;158(2):252-259. doi: 10.1002/ijgo.13988. Epub 2021 Oct 31. PMID: 34669187.
7. Clark TJ, Stevenson H. Endometrial Polyps and Abnormal Uterine Bleeding (AUB-P): What is the relationship, how are they diagnosed and how are they treated? Best Pract Res Clin Obstet Gynaecol. 2017 Apr;40:89-104. doi: 10.1016/j.bpobgyn.2016.09.005. Epub 2016 Oct 1. PMID: 27914969.
8. Don EE, Middelkoop MA, Hehenkamp WJK, Mijatovic V, Griffioen AW, Huirne JAF. Endometrial Angiogenesis of Abnormal Uterine Bleeding and Infertility in Patients with Uterine Fibroids-A Systematic Review. Int J Mol Sci. 2023 Apr 10;24(8):7011. doi: 10.3390/ijms24087011. PMID: 37108180; PMCID: PMC10138959.
9. Bhosale NM, Arakeri SU, Reddy AK, Mudanur SR. Endometrial blood vessel morphometry in patients presenting with abnormal uterine bleeding. Indian J Pathol Microbiol. 2022 Oct-Dec;65(4):844-850. doi: 10.4103/ijpm.ijpm_89_21. PMID: 36308191.
10. Narice BF, Delaney B, Dickson JM. Endometrial sampling in low-risk patients with abnormal uterine bleeding: a systematic review and meta-synthesis. BMC Fam Pract. 2018 Jul 30;19(1):135. doi: 10.1186/s12875-018-0817-3. PMID: 30060741; PMCID: PMC6066914.
11. Vitale SG, Buzzaccarini G, Riemma G, Pacheco LA, Di Spiezio Sardo A, Carugno J, Chiantera V, Török P, Noventa M, Haimovich S, De Franciscis P, Perez-Medina T, Angioni S, Laganà AS. Endometrial biopsy: Indications, techniques and recommendations. An evidence-based guideline for clinical practice. J Gynecol Obstet Hum Reprod. 2023 Jun;52(6):102588. doi: 10.1016/j.jogoh.2023.102588. Epub 2023 Apr 13. PMID: 37061093.
12. Leyland N, Laberge P, Evans D, Savard EG, Rittenberg D. Guideline No. 453: Endometrial Ablation in the Management of Abnormal Uterine Bleeding. J Obstet Gynaecol Can. 2024 Sep;46(9):102641. doi: 10.1016/j.jogc.2024.102641. Epub 2024 Aug 20. PMID: 39168283.
13. Shang M, Zhang W. Predictive factors of endometrial lesions in patients with abnormal uterine bleeding. Eur J Obstet Gynecol Reprod Biol. 2023 Sep;288:67-72. doi: 10.1016/j.ejogrb.2023.07.002. Epub 2023 Jul 11. PMID: 37451131.
14. Karimi M, Alizadeh A, Mahmoodi M. Clinicopathological Pattern of Endometrial Specimens in Women with Abnormal Uterine Bleeding and Ultrasonography Correlation. Arch Iran Med. 2024 Apr 1;27(4):216-222. doi: 10.34172/aim.2024.31. PMID: 38685848; PMCID: PMC11097308.
15. Laberge P, Leyland N, Murji A, Fortin C, Martyn P, Vilos G; Clinical Practice-Gynaecology Committee; Leyland N, Wolfman W, Allaire C, Awadalla A, Dunn S, Heywood M, Lemyre M, Marcoux V, Potestio F, Rittenberg D, Singh S, Yeung G; Society of Obstetricians and Gynaecologists of Canada. Endometrial ablation in the management of abnormal uterine bleeding. J Obstet Gynaecol Can. 2015 Apr;37(4):362-79. doi: 10.1016/s1701-2163(15)30288-7. PMID: 26001691.
16. Pennant ME, Mehta R, Moody P, Hackett G, Prentice A, Sharp SJ, Lakshman R. Premenopausal abnormal uterine bleeding and risk of endometrial cancer. BJOG. 2017 Feb;124(3):404-411. doi: 10.1111/1471-0528.14385. Epub 2016 Oct 20. PMID: 27766759; PMCID: PMC5297977.
17. Ferrando CA, Lintel MK, Bradley LD. Comparing endometrial biopsy results with hysteroscopic pathology in women presenting with abnormal and postmenopausal uterine bleeding. J Gynecol Obstet Hum Reprod. 2023 Dec;52(10):102685. doi:

10.1016/j.jogoh.2023.102685. Epub 2023 Oct 22. PMID: 37871649.