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Spectrum of Histopathological Findings in Hysterectomy Specimens for Abnormal Uterine Bleeding: A Clinicopathological Correlation Study at a Tertiary Care Center

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a common gynaecological complaint in reproductive and perimenopausal women, often requiring hysterectomy when refractory to conservative management. Histopathological examination of hysterectomy specimens is essential to confirm diagnoses and detect incidental pathologies.

Objectives: This study evaluated the spectrum of diseases associated with AUB in hysterectomy specimens and their clinico-pathological correlation.

Methods: A cross-sectional study was conducted over 18 months at the Department of Pathology, T.S. Misra Medical College and Hospital, Lucknow. Eighty-seven hysterectomy specimens from women with AUB were included. Clinical details, ultrasonographic findings, and histopathological features (H&E, special stains, ER/PR immunohistochemistry where indicated) were recorded and analysed.

Results: Heavy menstrual bleeding was the commonest presentation (46.0%), followed by peri-menopausal bleeding (21.8%). Ultrasonography most frequently showed uterine fibroid (34.6%) and thickened endometrium (33.3%). Histopathologically, leiomyoma predominated (37.9%), followed by endometrial hyperplasia (17.2%), endometrial polyp (12.6%), and adenomyosis (11.5%). Cervical carcinoma (3.4%) and endometrial carcinoma (2.3%) were also identified. Multiple pathologies coexisted in 45.5% of leiomyoma cases. A significant association existed between clinical presentations and hysterectomy indications ($p < 0.001$).

Conclusion: Leiomyoma was the most frequent histopathological diagnosis in AUB-related hysterectomies, followed by endometrial hyperplasia, with peak incidence in perimenopausal women. Good clinicopathological correlation was observed, particularly for benign lesions. Routine histopathological examination is recommended to identify unsuspected malignancies and coexisting pathologies.

Keywords: Abnormal uterine bleeding, Hysterectomy, Leiomyoma, Clinico-pathological correlation Histopathology

INTRODUCTION

Abnormal uterine bleeding (AUB) is a common problem affecting the women of reproductive age group and may also have a significant impact on their physical, social and emotional aspects directly affecting their quality of life. According to the International Federation of Gynecology and Obstetrics (FIGO) acute AUB could be classified as "an episode of bleeding in a woman of reproductive age, who is not pregnant that is of sufficient quantity to require immediate intervention to prevent further blood loss." In the premenopausal period, it may cause anemia and in the postmenopausal period it may raise the suspicion of malignancy.[1] It is estimated that about 10% to 30% of women will be affected by abnormal uterine bleeding during their lifetime.[2]

The classification system is divided into nine categories that are arranged according to the acronym PALM-COEIN: Polyp, Adenomyosis, Leiomyoma, Malignancy and hyperplasia, Coagulopathy, Ovulatory disorders, Endometrial, Iatrogenic and Not Classified.[3] International federation of Gynecology & obstetrics (FIGO) proposed three main causes of classification for uterine disorders: coagulopathy (AUB-C), disorder of ovulation (AUB-O), primary endometrial disorder (AUB-E).[4]

The histopathological examination of hysterectomy specimens is an essential component of the diagnostic workup, treatment planning and follow-up of patients undergoing this procedure.[5]

The burden of gynecological disorders in India is high with an estimated 25% of women suffering from menstrual disorders, 20-25% from fibroids and 10% from endometriosis. The prevalence of gynecological cancers is also increasing in India, particularly in urban areas.[6]

The clinicopathological correlation was found good when the cases were classified under PALM–COEIN classification.

MATERIALS AND METHODS

The present study was a cross-sectional study conducted in the Department of Pathology, T.S. Misra Medical College and Hospital, Lucknow, over a period of 18 months. The study population included all female patients presenting with abnormal uterine bleeding to the Department of Obstetrics and Gynecology of the same institution, who were scheduled to undergo hysterectomy either by the abdominal or vaginal route. Patients with relevant laboratory and radiological investigations and those who provided informed written consent were included in the study. The cases were recruited over a period of one year during the study duration. Complete enumeration of all hysterectomy specimens with AUB complaints within the 18-month period was targeted, with a minimum of 87 cases or all eligible cases, whichever was achieved first. Ultimately, 87 cases were included.

Clinical data were collected from patient case sheets, including name, age, presenting signs and symptoms, clinical history, Pap smear results, ultrasonographic findings, and clinical diagnoses. These data were

recorded using a standardized proforma and compiled into a Microsoft Excel spreadsheet for analysis. All hysterectomy specimens were processed following standard histopathological protocols. Special stains, such as Periodic Acid-Schiff (PAS), were applied when necessary to aid diagnosis. Immunohistochemical (IHC) assessment was performed for markers including estrogen receptor (ER) and progesterone receptor (PR) in cases with suspected malignancy to confirm diagnoses. IHC runs included negative and positive control slides, as recommended by the manufacturer, and were reviewed by an experienced pathologist. Lesions associated with AUB were classified according to standard criteria, and tumors were categorized as per the World Health Organization (WHO) Classification. Histopathological evaluations were conducted on H&E-stained sections and independently reviewed by two pathologists to ensure diagnostic accuracy..

RESULT AND OBSERVATION

The study included 87 patients who underwent hysterectomy for abnormal uterine bleeding.

Table 1: Distribution of the studied patients based on age group

Age group	Number of patients (n=87)	Percentage
30-40 Year	28	32.2%
41-50 Year	50	57.5%
51-60 Year	7	8.0%
>60 Year	2	2.3%
MEAN±SD	44.11±5.8	

Table 2: Distribution of the studied patients based on clinical diagnosis

Clinical Diagnosis	Number of patients (n=87)	Percentage
Abnormal uterine bleeding	19	21.8
Adenomyosis	8	9.2
Endometrial polyp	16	18.4
Cervical polyp	6	6.9
Fibroids	33	37.9
Post menopausal Bleeding	4	4.6
Severe dysmenorrhea with AUB	4	4.6
Ovarian cyst (Benign + Malignant)	3	3.4

Table 3: Distribution of the studied patients based on histopathological findings

Histopathological findings	Number of patients (n=87)	Percentage
Leiomyoma	33	37.9
Endometrial Hyperplasia	15	17.2
Endometrial polyp	11	12.6
Adenomyosis	10	11.5
Cervical polyp	5	5.7
CIN/ Dysplasia	5	5.7

Ovarian tumor	3	3.4
Cervical cancer	3	3.4
Endometrial cancer	2	2.3

Table 4: Association of diseases for leiomyoma in the study

Leiomyoma findings	Number of patients (n=33)	Percentage
No association	5	15.2%
Adenomyosis	4	12.1%
Endometrial polyp	4	12.1%
Endometrial Hyperplasia	2	6.1%
Chronic cervicitis	3	9.1%
Multiple pathology	15	45.5%

The most common clinical diagnosis(reference table 2) was fibroids, assigned to 33 patients (37.9%), followed by abnormal uterine bleeding in 19 patients (21.8%) and endometrial polyp in 16 patients (18.4%). Adenomyosis was diagnosed in 8 patients (9.2%), cervical polyp in 6 patients (6.9%), and both post-menopausal bleeding and severe dysmenorrhea with AUB in 4 patients each (4.6%). Benign or malignant ovarian cyst was the clinical diagnosis in 3 patients (3.4%).

The distribution of the studied patients based on histopathological findings (reference table 3) was analyzed. The most common finding was leiomyoma, observed in 33 patients (37.9%) (reference table 4). This was followed by endometrial hyperplasia (17.2%). Endometrial Hyperplasia showed considerable morphological variation among all 15 patients.

There were cases of ovarian tumour encountered in the present study, comprising two cases of benign serous cystadenoma and one case of dermoid cyst.

Three cases of cervical squamous cell carcinoma were encountered in the present study. Of these, two cases were of the non-keratinizing type, characterized histologically by malignant squamous cells arranged in sheets and nests with marked nuclear pleomorphism, hyperchromasia, increased mitotic activity, and absence of keratin pearl formation. One case was of the keratinizing type, which on histopathological examination showed prominent keratin pearl formation, individual cell keratinization, intercellular bridges, and malignant squamous cells exhibiting marked nuclear atypia and frequent mitoses.

Two cases of endometrial carcinoma were observed during the present study. One case was of villoglandular carcinoma, which on histopathological examination showed complex villous and papillary glandular architecture lined by stratified malignant endometrial cells exhibiting mild to moderate nuclear atypia and increased mitotic activity. The other case was mucinous endometrial carcinoma, characterized histologically by glands and tumor cells containing abundant intracellular mucin, mucin-secreting columnar cells resembling endocervical epithelium, and varying degrees of nuclear atypia.

PHOTO PLATE

Plate 1: A large subserosal leiomyoma

Plate 2: Endometrial polyp

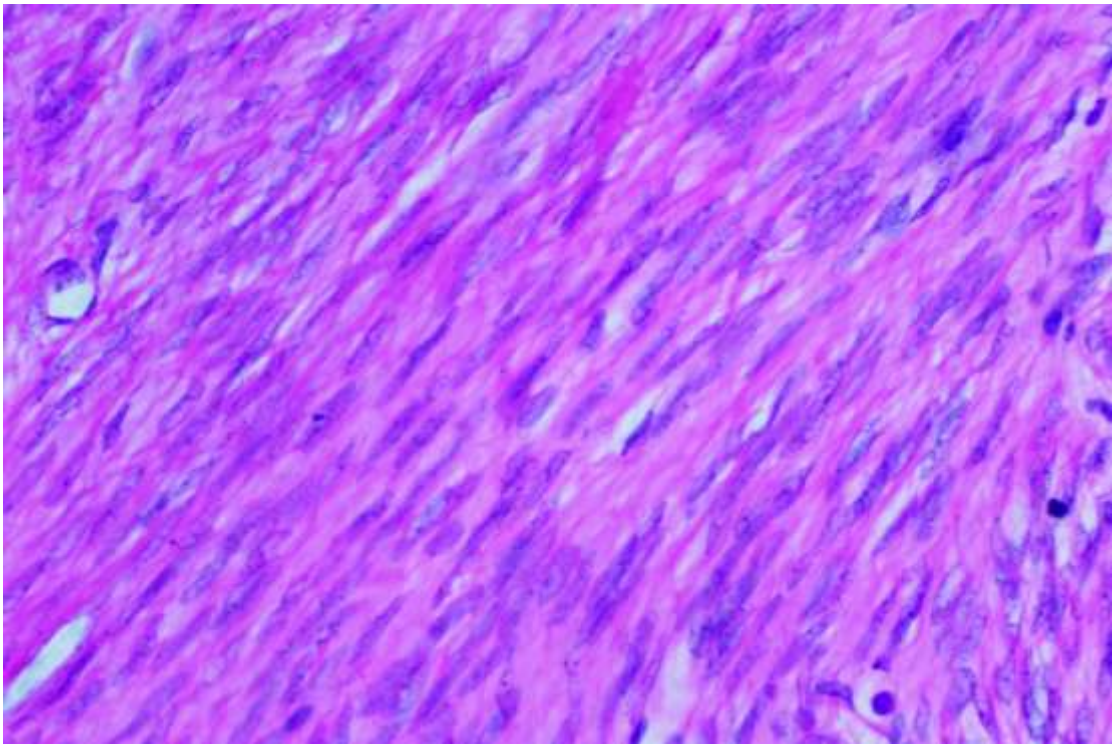

Plate 3: Leiomyoma at 40X (H&E stain)

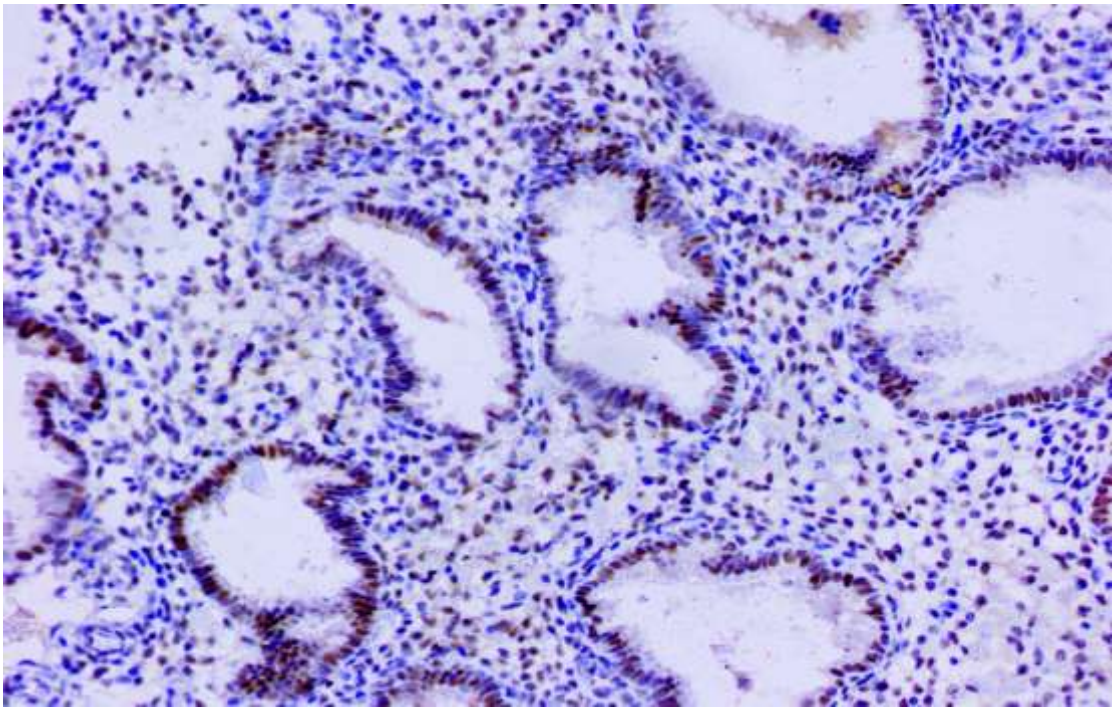

Plate 4: Endometrial hyperplasia without atypia ER 20X strong gland and stroma positivity

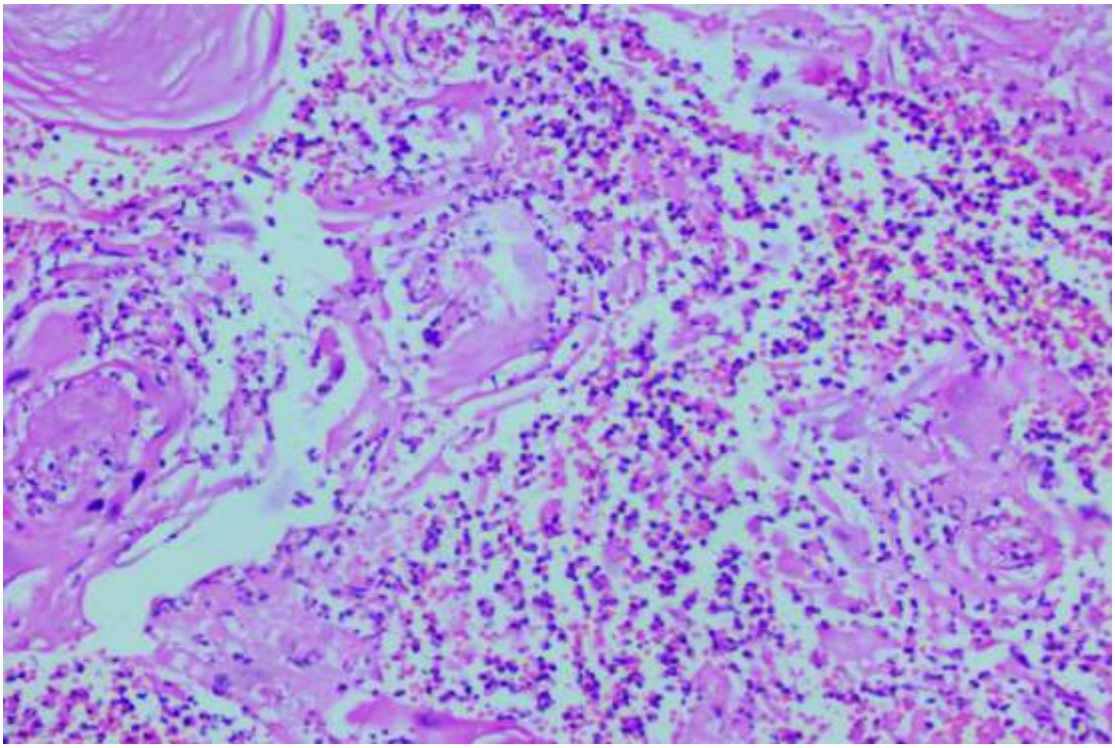

Plate 5- Cervix Squamous cell carcinoma keratinizing type at 20 X (H&E stain)

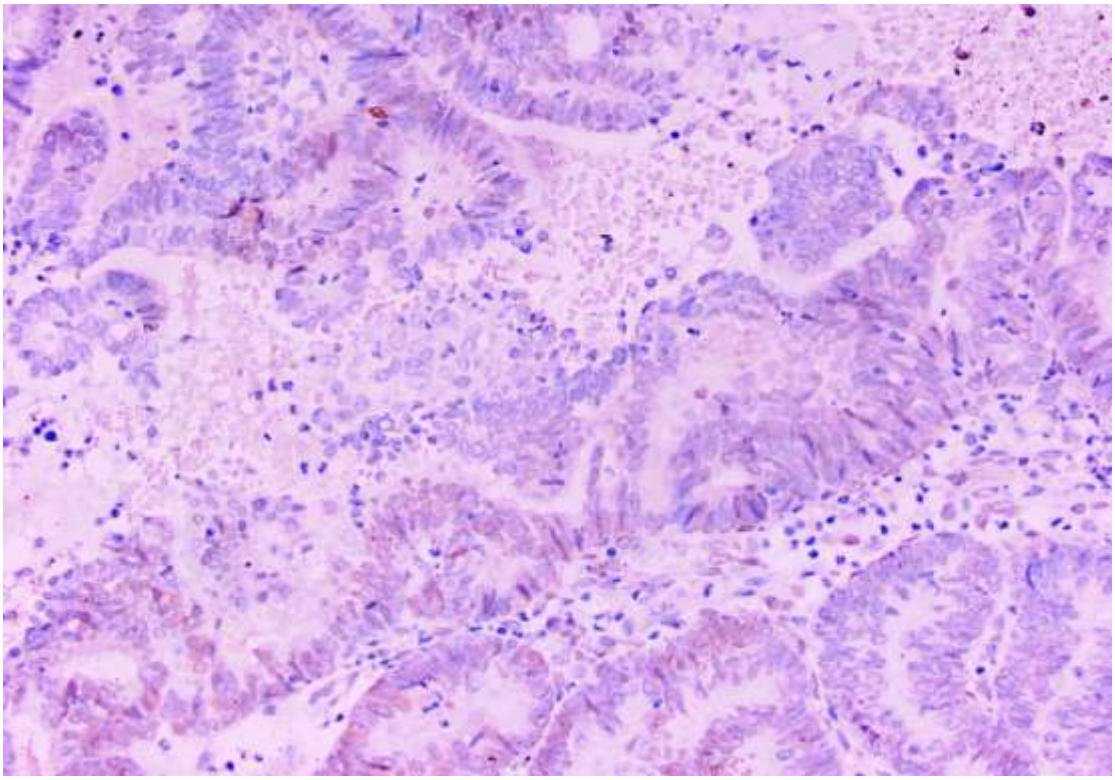

Plate 6: Endometrial carcinoma (Villoglandular Variant) ER 20X faint

DISCUSSION

The clinico-pathological correlation of AUB is vital, as clinical presentation alone may not reliably predict the underlying pathology. Histopathological examination not only confirms the diagnosis but also

identifies incidental or coexisting lesions that may alter management strategies. Studies across diverse populations have consistently demonstrated that the spectrum of diseases associated with AUB in hysterectomy specimens ranges from benign conditions such as leiomyomas, adenomyosis, and endometrial hyperplasia to malignant lesions including endometrial carcinoma.[7,8] A structured approach to establishing the cause using the FIGO - PALMCOEIN classification system facilitates accurate diagnosis and treatment options.[9] Hysterectomy, which involves removing the uterus, is the most commonly performed major gynecological surgery worldwide, with its prevalence varying by region.

In the present study, the mean age of the studied cases was 44.11±5.8 years, with the majority of the cases in the age range from 41-50 years (57.5%) followed by 30-40 years (32.2%), 51-60 years (8.0%) and more than 60 years (2.3%). Our findings were comparable to the findings of **Sofiatamilarasi C et al**[10] who reported that the mean age of the study participants was 45.41 ± 7.24 years. Majority of participants (n=145) were in 41 to 50 years age group, followed by 58 participants in 31 to 40 years age group. 31 participants were from 51 to 60 years of age, 9 participants were from 61 to 70 years of age and 6 participants were from 21 to 30 years of age.

In the present study, the predominant clinical presentation was heavy menstrual bleeding, accounting for nearly half of the cases (46%), underscoring its role as the most common indication for hysterectomy in women with abnormal uterine bleeding. Postmenopausal bleeding was the second most frequent presentation (21.8%), highlighting its clinical importance as a potential marker of underlying pathology requiring definitive evaluation. Abnormal uterine bleeding in general was noted in 13.8% of patients, while intermenstrual bleeding contributed to 8%. Our findings were consistent with the findings of **Shah D et al**[11]**,** who reported that heavy menstrual bleeding was the most common presenting symptom, accounting 86 (29%) out of 300 women followed by Intermenstrual bleeding (25.0%), Frequent menstrual bleeding (21.0%), Postmenopausal bleeding (19.0%) and Heavy prolonged menstrual bleeding (6.0%). In the **Kinake MS et al**[12] study, predominant pattern of AUB were reported as menorrhagia in 338 cases (51.13%), followed by intermenstrual bleeding in 115 cases (17.39%), polymenorrhagia in 79 cases (11.95%), while metrorrhagia was seen in 73 cases (11.04%). **Bindu PJ et al**Error! Bookmark not defined. saw heavy menstrual bleeding in 239 (75%) women, Intermenstrual bleeding was seen in 40 (12%) cases. Postmenopausal bleeding was seen in 31 (10%) women. Nine (3%) women showed breakthrough bleeding.

In the present study, the most frequent findings were endometrial pathology (39.1%) and uterine fibroids (34.5%), reflecting their dominant role in the etiological spectrum of AUB. Other notable diagnoses included bulky uterus (13.8%), cysts (12.6%), and adenomyosis (11.5%), all of which are common benign conditions contributing to menstrual disturbances. Less frequent but clinically significant findings were pelvic inflammatory disease (2.3%), cervical cancer (1.1%), and isolated cases of IUCD-related changes (1.1%) and leiomyoma (1.1%). Our findings were in concordance with the findings of **Kondareddy R, and Gomathy E**[14], who reported that 46.67% were diagnosed to have fibroid, 23.3% had Adenomyosis, 12.22% had DUB, 5.56% had polyp, 3.33% had endometrial and 2.22% had cervical carcinoma. Similar study by **Bharti M and Bhol SK**[15] the most common ultrasound diagnosis was leiomyoma/fibroid/AUB-L, followed by adenomyosis/ AUB-A i.e., structural causes were more common than non-structural. In contrast to the study done, according to **Anupamasuresh Y et al**[16] the most common USG diagnosis was non-structural followed by structural causes (AUB-L, AUB-A).

CONCLUSION

AUB comprises a wide spectrum of symptoms and presentations, taking into consideration various factors. Every case of AUB has its own characteristic findings on USG, endometrial biopsy and histopathology; hence a generalized or a single modality of treatment cannot be applicable for every patient.

The clinical findings suggest the different causes of AUB are narrowed by taking proper history, ultrasonography and the confirmed diagnosis is achieved after histopathological examination. In patients with AUB the most common complaint and clinical presentation is HMB. Among them the most common histopathological diagnosis is Leiomyoma.

The present study confirms a good correlation between clinical findings and histopathology especially in benign conditions.

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