

# The Role of Office Hysteroscopy in The Diagnosis of Uterine Pathology in Cases with Perimenopausal Bleeding

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## ABSTRACT

**Background:** Perimenopausal bleeding refers to any bleeding from the vaginal tract that deviates from the typical frequency, cyclicity, duration, and quantity of flow, occurring at or above the age of Forty. **Aim:** The current study aimed to examine how individuals who attended an outpatient gynecologic clinic with perimenopausal hemorrhage responded to office hysteroscopy. **Patient and Methods:** This prospective research was performed on 80 females had perimenopausal hemorrhage who had endometrial biopsy and office hysteroscopy, at Damanhour Medical National Institute from August 2023 till January 2024. **Results:** According to bleeding pattern, 26 women (32.5%) had menorrhagia, 19 women (23.8%) had metrorrhagia, 22 women (27.5%) had menometrorrhagia, 13 women (16.2%) had polymenorrhoea. According to sonographic analysis, endometrial thickness ranged from (8-25) mm with a mean±SD (13.2±2.9) mm. In 51 women (63.8%) who had a hysteroscopy, the thickness of endometrium was normal; in 49 females (36.2%), it was dense. 66 females (82.5%) had no hysteroscopically visible endometrial lesions, 5 had masses, and 11.3% had polyps in endometrium. Using a hysteroscope to assess endometrial vascularity, we discovered that 69 women (86.3%) had a normal vascularity of endometrium, while 11 women (13.7%) had endometrium hyper vascularity. For endometrial pathology, 3 women (3.7%) exhibited atypia and endometrial hyperplasia, 10 females (12.5%) exhibited atypia-free simple endometrial hyperplasia., and two women (2%) had cancer in endometrium. **Conclusion:** Office hysteroscopy can be regarded as a definitive and very effective method for diagnosing and treating perimenopausal bleeding.

**Keywords:** Perimenopausal bleeding, Office Hysteroscopy, Uterine pathology, Gynecologic clinic.

## INTRODUCTION

Perimenopausal bleeding refers to any bleeding from the genital tract that deviates from the normal frequency, cyclicity, duration and amount of flow in individuals aged forty years and above. Around twenty percent of cases who visit gynecologists have abnormal uterine bleeding and this percentage increases to sixty-nine percent among those in the perimenopausal age group <sup>(1)</sup>.

Abnormal uterine bleeding (AUB) is the primary cause for gynecological appointments among women in their peri- and postmenopausal years, constituting roughly fifteen percent of all visits. This syndrome has significant implications for social life, disease burden and clinical effort <sup>(2)</sup>.

Fibroids or polyps are the primary etiology of anatomic abnormal uterine bleeding. Approximately 20 to 40 percent of women are affected by fibroids. These females may exhibit symptoms as atypical bleeding, anemia, discomfort and even infertility <sup>(3)</sup>.

According to **Nanda et al.** the clinical definition of the menopausal transition is the period that precedes the beginning of the condition, which typically begins around the age of 40 to 45 <sup>(4)</sup>. The reason for perimenopausal bleeding can be determined using various diagnostic techniques, including curettage and dilatation, endometrial biopsy, transvaginal ultrasound, and hysteroscopy. Transvaginal sonography (TVS) enables extensive examination of anatomical abnormalities of uterus and endometrium because of its excellent accuracy and patient compliance <sup>(5)</sup>. The myometrium, tubes, cervix, and ovaries might also have diseases that are evaluated.

According to **Singh et al.**, TVS may help detect leiomyomas, endometrial polyps, abnormalities of uterine, and generalized thickening of endometrium linked to cancer and hyperplasia <sup>(6)</sup>. Office hysteroscopy, being a non-hospitalized and non-anesthetic procedure, is a cost-effective option. The operation may be conducted on an outpatient basis or as a day case method and it is well-received and satisfying for cases <sup>(7)</sup>.

The current study aimed to examine how individuals who attended an outpatient gynecologic clinic with perimenopausal hemorrhage responded to office hysteroscopy.

## PATIENTS AND METHODS

This prospective research was performed on 80 females who had perimenopausal hemorrhage and who had endometrial biopsy and office hysteroscopy, at Damanhour Medical National Institute from August 2023 till January 2024.

### Inclusion criteria:

Ladies ranging in age from 40 to 45 years old, experiencing atypical perimenopausal bleeding, Hodge replacement therapy was not utilized., and didn't confirm an individual history of carcinoma of the genital tract, and most of the cases had comorbid conditions such as diabetes, hypertension, and chronic liver disease.

### Exclusion criteria:

Women had bleeding disorders or coagulopathies, such as acute leukemia, Von Willebrand disease, or platelet dysfunction and ladies who were using anticoagulants.

The period preceding menopause, which can continue up to 10 years, is known as perimenopause, according to ACOG. Changes in hormone levels during perimenopause may impact the endometrium and result in an irregular endometrial development pattern. Most of the women in this research had comorbid conditions such as diabetes, hypertension, and chronic liver disease. These morbidities may change the endometrial pattern and activity because they impact uterine and endometrial vascularity<sup>(8)</sup>. All the patients that were included received transvaginal ultrasonography to determine the endometrial thickness, and they all had possible endometrial pathology. In a sagittal scan, to ascertain the thickness of endometrium, the greatest space among the two lines at the interface of the endometrium as well as myometrium was utilized.

All research participants had hysteroscopy using the paracervical block, an obstetrics and gynecology procedure in which local anesthetic was injected among three and seven millimeters deep along the vaginal fornices of the cervix. By giving lidocaine, endometrial biopsy samples from all instances were collected for histopathological analysis and a thorough clinical history and examination.

**Ethical Consideration**

The medication utilized in the investigation was confirmed by the Egyptian Ministry of Health. The Ethics Committee of Egypt General Organization for Teaching Hospitals & Institutes (GOTHI). Research Centre approved the research protocol, ethical approval ID: HD000172. Prior to enrollment, written informed consent was gathered from individuals or their legal representatives in accordance with the individual's condition. The purpose of this study was to perform research on humans in compliance with the Declaration of Helsinki, the code of ethics of the World Medical Association.

**Statistical analysis:** The twentieth version of the statistical package for the social sciences (SPSS Inc., Illinois, Chicago, USA) was utilized to analyze the gathered information. Quantitative data were presented as mean ± standard deviation (SD) and range. Qualitative data were presented as frequency and percentage. The area under the receiver's operating characteristic curve (AUC), sensitivity, specificity, positive predictive value (PPV), as well as negative predictive value (NPV) were utilized to determine the optimal cut-off point. The confidence interval was established at ninety-five percent whereas the allowable margin of error was set at five percent. Thus, the p-value was considered significant at 0.05.

**RESULTS**

According to demographic data, mean±SD of age was (42.8±1.7) year and mean±SD of parity was (2.6±1.4) (Table 1).

**Table (1): Demographic data in examined cases**

		Studied women (n=80)
<b>Age (years)</b>	Range	40-45
	Mean ± SD	42.8±1.7
<b>Parity</b>	Range	0-5
	Mean ± SD	2.6 ± 1.4

According to bleeding pattern, menorrhagia was the most common pattern (Table 2).

**Table (2): Bleeding pattern in included women**

Bleeding pattern	Studied women (n=80)
Menorrhagia	26 (32.5%)
Metrorrhagia	19 (23.8%)
Menometrorrhagia	22 (27.5%)
Polymenorrhoea	13 (16.2%)

According to sonographic analysis, mean±SD of endometrial thickness was (13.2±2.9) mm. In 51 women (63.8%) who had a hysteroscopy, the thickness of endometrium was normal. 66 females (82.5%) had no hysteroscopically visible endometrial lesions. Using a hysteroscope to assess endometrial vascularity, we discovered that 69 women (86.3%) had a normal vascularity of endometrium. For endometrial pathology, 10 females (12.5%) exhibited atypia-free simple endometrial hyperplasia (Table 3).

**Table (3): Pathological, hysteroscopic and sonographic outcomes in examined cases**

	Studied women (n=80)
<b>Endometrial Pathology</b>	
Proliferative	56 (70%)
Atrophic	9 (11.3%)
Atypia	3 (3.7%)
Simple Endometrial Hyperplasia without	10 (12.5%)
Endometrial Hyperplasia with Atypia	
Endometrial Carcinoma	2 (2.5%)
<b>Hysteroscopic Endometrial Thickness</b>	
Normal	51 (63.8%)
Thick	49 (36.2%)
<b>Hysteroscopic Endometrial Lesion</b>	
None	66 (82.5%)
Polyp	9 (11.3%)
Mass	5 (6.2%)
<b>Hysteroscopic Endometrial Vascularity</b>	
Normal	69 (86.3%)
Hyper vascular	11 (13.7%)
<b>Sonographic Endometrial Thickness (mm)</b>	8-25
Range	13.2 ± 2.9
Mean ± SD	

The connection of ten millimeters in endometrial thickness as well as aberrant endometrial pathology was identified as statistically significant within the women who participated in the study. With a ninety-six percent specificity as well as an infinite LR+, endometrial thickness of seventeen millimeters was significantly linked with malignant or premalignant endometrial pathology. On the contrary, an endometrial thickness of ten millimeters was linked to the absence of any premalignant or malignant lesion with a sensitivity of ninety-n percent as well as an LR-value of nil (Table 4).

**Table (4): Validity of endometrial thickness as predictor of cancer, precancerous conditions and aberrant endometrial pathology in examined cases**

Sonographic endometrial Thickness	Sensitivity	Specificity	LR+	LR-
≥ 17 mm	28% (0.82 to 76.4)	96% (90 to 98)	∞	0.79 (0.45 to 1.48)
≤ 10 mm	98% (44 to 98)	62% (48 to 76)	2.56 (1.82 to 3.34)	0.0
≥ 10 mm	39% (33 to 68)	97% (62 to 97)	∞	0.58 (0.43 to 0.71)
≤ 7 mm	91% (60 to 95)	60% (32 to 74)	2.25 (0.89 to 4.6)	0.26 (0.08 to 0.65)

LR+: Positive likelihood ratio, LR-: Negative likelihood ratio

Endometrial the accuracy of various hysteroscopic findings in identifying premalignant (Atypical endometrial hyperplasia) or malignant (cancer in endometrium) pathology of endometrium in one hundred females. We discovered that hysteroscopic thick endometrium had 74% specificity, LR+ 4.3, a 98% sensitivity, & nil LR- as a predictor of malignant or premalignant endometrial disease. Endometrial polyps detected during hysteroscopy exhibited specificity of 92%, a sensitivity of 62%, LR- 1.2 & LR+ 0.0, as predictors. The hysteroscopic endometrial mass showed, endless LR- 0.0 & LR+, 98% sensitivity, and 99% specificity as a predictor.

With nil LR-, the study provided evidence for the predictive power of different hysteroscopic outcomes in identifying aberrant endometrial pathology, such as endometrial hyperplasia with or without atypia or endometrial carcinoma, in the cases who were enrolled. Hysteroscopic hyper vascular endometrium had specificity and sensitivity of 93% and 55%, correspondingly. Endometrium that was hysteroscopically thick showed specificity of 91.4%, a sensitivity of 79%, LR- 0.29 and LR+ 9.7, as predictors of abnormal endometrial pathology. Hysteroscopic endometrial polyps revealed sensitivity of 83%, specificity of 90.8%, and lack of LR-1.18 and LR+. A hysteroscopic mass of the endometrium showed an endless LR- 0.81 and LR+, specificity and sensitivity, of 97% and 25.8%, correspondingly. Hysteroscopic hyper vascular endometrium as a predictor showed LR+ 3.9 and LR- 0.87, 25.4% sensitivity, and 94.3% specificity (Table 5).

**Table (5): Validity of hysteroscopic outcomes as predictor of adverse, adverse, and abnormal endometrial pathology in examined cases**

	Sensitivity	Specificity	LR+	LR-
<b>I) Malignant or Premalignant Endometrial Pathology</b>				
Hysteroscopic Thick Endometrium	98% (42 to 98)	74% (60 to 86)	4.3 (2.6 to 6.9)	0.0
Hysteroscopic Endometrial Polyp	62% (8 to 86)	92% (80 to 96)	0.0	1.2 (0.96 to 1.75)
Hysteroscopic Endometrial Mass	94% (25 to 96)	98% (90 to 99)	∞	0.0
Hysteroscopic Hyper vascular Endometrium	55% (12 to 88)	93% (82 to 97)	10.2 (2.9 to 56.6)	0.63 (0.22 to 1.5)
<b>II) Abnormal Endometrial Pathology</b>				
Hysteroscopic Thick Endometrium	79% (41.6 to 92.8)	91.4% (83.7 to 97.6)	9.7 (4.2 to 35.3)	0.29 (0.12 to 0.88)
Hysteroscopic Endometrial Polyp	83% (6 to 69.4)	90.8% (77.6 to 97.2)	0.0	1.18 (0.96 to 1.44)
Hysteroscopic Endometrial Mass	25.8% (4.9 to 63.5)	97% (89.4 to 99)	∞	0.81 (0.56 to 1.26)
Hysteroscopic Hypervascular Endometrium	25.4% (4.8 to 63.6)	94.3% (82 to 97)	3.9 (0.9 to 24.9)	0.87 (0.59 to 1.31)

LR+: Positive likelihood ratio, LR-: Negative likelihood ratio

## DISCUSSION

Perimenopausal blood loss is a significant clinical problem for gynecologists, as it may suggest the development of endometrial malignant alterations. Therefore, it is crucial to conduct a precise examination of the endometrium and uterine cavity. While rare, endometrial polyps have the potential to be the source of cancer <sup>(9,10)</sup>.

Consequently, several methods are emerging to uncover the optimal diagnostic strategy and the suitable therapeutic regimen for perimenopausal hemorrhage. Clinical trials and research studies are examining the precision, specificity, and sensitivity of various diagnostic instruments, and comparing them to determine the optimal and most accurate option <sup>(11)</sup>.

According to demographic data, our results revealed that age varied from 40 to 45 years with average  $42.8 \pm 1.7$  years, parity varied from 0 to 5 with average  $2.6 \pm 1.4$ .

Our findings accord with those of **Shor et al.** <sup>(12)</sup>, who examined the potential of hysteroscopic characteristics to aid in the identification of cancer in endometrial polyps. The study findings indicated that the average age was  $55.4 \pm 12.4$  years, and the median parity was 2.

Furthermore, our results align with the research performed by **Ahmed et al.** <sup>(13)</sup>, which sought to assess the precision of 3D ultrasound and hysteroscopy in identifying uterine lesions in cases of perimenopausal bleeding. The average age of the population under study was  $43.5 + 6.12$  years, while the average parity was  $3.43 + 2.8$ . As regards bleeding pattern, the present study reported that 26 (32.5%) women had menorrhagia, 19 (23.8%) women had metrorrhagia, 22 (27.5%) women had menometrorrhagia, and 13 (16.2%) women had polymenorrhoea.

Also, our findings in line with **Nafad et al.** <sup>(14)</sup> who demonstrated that menorrhagia accounted for 31 percent of instances, whereas menometrorrhagia (28 percent), metrorrhagia (21 percent), and polymenorrhoea (20 percent) were the most prevalent bleeding patterns.

Similar to **Haemila et al.** <sup>(15)</sup> who found that menometrorrhagia (22.8 percent), metrorrhagia (34.2 percent), and polymenorrhoea (34.2 percent) were the most prevalent bleeding patterns, accounting for 13 (40 percent), our outcomes also support their findings.

According to sonographic analysis, our findings revealed that endometrial thickness ranged from 8 to 25 mm with a mean  $13.2 \pm 2.9$  mm. In 51 (63.8%) women who had a hysteroscopy the thickness of endometrium was normal; endometrium was dense in 49 (36.2%) females. 66 (82.5%) females had no hysteroscopically visible endometrial lesions, 5 (6.2%) females had masses, and 9 (11.3%) females had polyps in endometrium.

Furthermore, our research aligns with the study conducted by **Mohamed et al.** <sup>(16)</sup>, which examined the effectiveness of office hysteroscopy as a diagnostic tool for evaluating women with perimenopausal hemorrhage. Their research indicated that the endometrial thickness varied between 6 and 22 millimeters, with an average of  $10.5 \pm 3.17$  mm. Hysteroscopy revealed that 35 women (70 percent) had a normal endometrial thickness, while 15 women (30 percent) had a thick endometrium. In relation to hysteroscopic endometrial lesions, out of the 45 women, 90 percent did not have any lesions, whereas 6 percent had endometrial polyps and 4 percent had masses.

Using a hysteroscope to assess endometrial vascularity, we discovered that 69 (86.3%) women had a normal vascularity of endometrium, while 11 women (13.7%) had endometrium hyper vascularity. As regards endometrial pathology, 3 (3.7%) women exhibited atypia and endometrial hyperplasia, 10 (12.5%) females exhibited atypia-free simple endometrial hyperplasia and two women (2%) had cancer in endometrium.

Regarding endometrial vascularity seen during hysteroscopy, our results align with **Mohamed et al.** <sup>(16)</sup> who reported that 46 (92%) women had normal endometrial vascularity, whereas 4 (8%) women had hypervascular endometrium. In relation to endometrial pathology, out of the total of fifty females, seven (fourteen percent) had atrophic endometrium, thirty-four (both 68%) had proliferative endometrium, seven (fourteen percent) had simple endometrial hyperplasia without atypia, one (two percent) had endometrial hyperplasia with atypia, and 1 (two percent) had endometrial cancer.

This result is in line with **Dias et al.** <sup>(17)</sup>, who assessed the efficacy of hysteroscopic parameters in distinguishing between endometrial polyps and endometrial cancer. The study found that there was a strong correlation between postmenopausal hemorrhage, endometrial hypervascularity, vascular atypia and the presence of endometrial cancer during diagnostic hysteroscopy.

Furthermore, our results corroborated the findings of **Shor et al.** <sup>(12)</sup> who conducted a study on the prediction of malignant endometrial polyps based on hysteroscopic characteristics. Their research indicated that heightened vascularity observed in hysteroscopic examination of endometrial polyps might potentially indicate the presence of malignant polyps.

The present study revealed that connection of ten millimeters in endometrial thickness as well as aberrant endometrial pathology was identified as statistically significant within the women who participated in the study. With a ninety-n percent specificity as well as an infinite LR+, endometrial thickness of seventeen millimeters was significantly linked with malignant or premalignant endometrial pathology. On the contrary, an endometrial thickness of ten millimeters was linked to the

absence of any premalignant or malignant lesion with a sensitivity of ninety-n percent as well as an LR-value of nil.

This study is consistent with **Mohamed *et al.***<sup>(16)</sup> who reported that sonographic endometrial thickness was statistically significant as a predictor of premalignant/malignant endometrial pathological alterations. Premalignant or malignant endometrial pathology was statistically significantly correlated with endometrial thickness exceeding 17 mm, with a sensitivity of 25 percent and a specificity of one hundred percent. Conversely, endometrial pathology was statistically significantly correlated with endometrial thickness between 10-17 mm, with 100 percent specificity, whereas endometrial thickness more than seven millimeters was correlated with no endometrial pathology, with a sensitivity of 88.24 percent.

The current research reported that hysteroscopic thick endometrium had 74% specificity, LR+ 4.3, a 98% sensitivity, and nil LR- as predictor of premalignant or malignant endometrial disease. Endometrial polyps detected during hysteroscopy exhibited specificity of 92%, a sensitivity of 62%, LR- 1.2 and LR+ 0.0, as predictors. The hysteroscopic endometrial mass showed endless LR- 0.0 and LR+, 98% sensitivity, and 99% specificity as a predictor.

This work is in line with **Mohamed *et al.***<sup>(16)</sup>, who found that a thick endometrium observed by hysteroscopy can predict the presence of malignant or premalignant endometrial pathology with a one hundred percent sensitivity, 76.09 percent specificity, a positive likelihood ratio (LR+) ranging from four to eighteen and a null negative LR-. The sensitivity of hysteroscopic endometrial adenoma as a predictor was 60 percent, with a specificity of 93.48 percent. The positive likelihood ratio (LR+) was 0.0, while the negative LR- was 1.07. The hysteroscopic endometrial mass demonstrated a predictive ability with a specificity and sensitivity of 100 percent each, along with an infinite positive likelihood ratio (LR+) and a negative likelihood ratio (LR-) of 0.0.

The current study is consistent with a meta-analysis conducted by **Gkrozou *et al.***<sup>(18)</sup> that assessed the efficacy of hysteroscopy in the diagnosis of endometrial cancer, hyperplasia, polyps and submucous myomas. They stated that office hysteroscopy had a sensitivity and specificity of over 95 percent in the diagnosis of both endometrial polyps and masses.

Similarly, our results are in concordance with **Shor *et al.***<sup>(12)</sup> who revealed that hysteroscopy has a sensitivity of one hundred percent and a specificity of 98.7 percent in the diagnosis of endometrial polyps and masses.

With nil LR-, this study provided evidence for the predictive power of different hysteroscopic outcomes in

identifying aberrant endometrial pathology, such as endometrial hyperplasia with or without atypia or endometrial carcinoma, in the cases who were enrolled. Hysteroscopic hyper vascular endometrium had specificity and sensitivity of 93% and 55%, correspondingly. Endometrium that is hysteroscopically thick, showed specificity of 91.4%, a sensitivity of 79%, LR- 0.29 and LR+ 9.7, as predictors of abnormal endometrial pathology. Hysteroscopic endometrial polyps revealed sensitivity of 83%, specificity of 90.8%, and lack of LR-1.18 and LR+. A hysteroscopic mass of the endometrium showed an endless LR- 0.81 and LR+, specificity and sensitivity, of 97% and 25.8%, correspondingly. Hysteroscopic hyper vascular endometrium as a predictor showed LR+ 3.9 and LR- 0.87, 25.4% sensitivity, and 94.3% specificity.

The current study agrees with **Mohamed *et al.***<sup>(16)</sup> who found that various hysteroscopic findings can reliably predict abnormal endometrial conditions such as endometrial hyperplasia with or without atypia, or endometrial cancer, in the studied population. The hysteroscopic thick endometrium showed a sensitivity of 77.8 percent, specificity of 92.7 percent, positive likelihood ratio (LR+) of 10.6, and negative LR- of 0.24 in predicting abnormal endometrial pathology. The hysteroscopic examination of the endometrial polyp showed a sensitivity of 80 percent, a specificity of 92.6 percent, and a negative LR- of 1.1. The sensitivity and specificity of hysteroscopic endometrial mass were 22.2% and 100%, respectively, with an infinite positive likelihood ratio (LR+) and a negative likelihood ratio (LR-) of 0.78. The presence of hysteroscopic hypervascular endometrium was found to be a predictor, with a sensitivity of 22.2 percent, a specificity of 95.1 percent, a positive LR+ of 4.6, and a negative likelihood ratio (LR-) of 0.82.

Also, our findings are in line with **Trojano *et al.***<sup>(19)</sup> who demonstrated that hysteroscopy indicated a sensitivity of 66.7 percent and a specificity of one hundred percent in the diagnosis of endometrial hyperplasia, while it demonstrated a sensitivity and specificity of 100 percent and 98.6 percent in the diagnosis of endometrial carcinoma.

## CONCLUSION

The purpose of the research was to examine the function of office hysteroscopy in the diagnosis of uterine pathology in cases of perimenopausal bleeding. We have determined that office hysteroscopy is a gold standard instrument for the diagnosis and management of perimenopausal bleeding. It is also beneficial for the evaluation of the endometrium and for the planning of management.

## DECLARATIONS

- **Funding:** No fund.
- **Availability of data and material:** Available.
- **Conflicts of interest:** No conflicts of interest.
- **Competing interests:** None.

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