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Selective Endometrial Screening versus Routine Curettage in Postmenopausal Women Undergoing Intrauterine Device Removal: A Retrospective Cohort Study

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Research Article

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Abstract

Background

The choice between selective and routine endometrial screening during postmenopausal intrauterine device (IUD) removal remains controversial. Universal blind curettage frequently yields insufficient endometrial tissue and results in overtreatment. This study aimed to evaluate a selective, risk-stratified endometrial screening strategy for postmenopausal women undergoing IUD removal and develop an individualized endometrial screening strategy for this patient population.

Methods

A total of 512 naturally postmenopausal women (amenorrhea ≥ 12 months) who underwent IUD removal were retrospectively enrolled. According to the presence or absence of postmenopausal abnormal uterine bleeding (AUB), patients were divided into a bleeding group (n = 128) and a non-bleeding group (n = 384). All patients with AUB underwent endometrial sampling; asymptomatic patients were sampled only when high-risk transvaginal ultrasound findings were present (endometrial thickness > 8 mm, heterogeneous echogenicity, or uterine cavity effusion; n = 218). The remaining 166 low-risk asymptomatic patients underwent IUD removal alone. Baseline clinical characteristics, preoperative transvaginal ultrasound findings, and postoperative pathological outcomes were analyzed.

Results

Patients with AUB had significantly higher body mass index (BMI), higher prevalence of diabetes mellitus, hormone replacement therapy (HRT) history, and tamoxifen exposure history (all $P < 0.05$). Endometrial thickening, heterogeneous echogenicity, and uterine cavity effusion were all significantly more common in the AUB group (all $P < 0.001$), whereas the rate of IUD incarceration did not differ ($P = 0.121$). Among the 346 sampled patients, the overall detection rate of significant endometrial lesions (hyperplasia with or without atypia and carcinoma) was 10.40%. The lesion detection rate in the bleeding group was 14.06%, which was significantly higher than 8.26% in the asymptomatic ultrasound high-risk group ($P = 0.040$). Low-risk asymptomatic patients with normal ultrasound presented an extremely low risk of severe endometrial lesions. Blind curettage yielded invalid tissue specimens in a proportion of cases.

Conclusions

Postmenopausal abnormal uterine bleeding, abnormal endometrial ultrasound features, diabetes, obesity, and hormone-related exposure are significant risk factors for endometrial lesions in postmenopausal women undergoing IUD removal. Routine universal curettage is unnecessary for

unselected postmenopausal women undergoing IUD removal. A selective endometrial screening strategy integrating clinical symptoms, transvaginal ultrasound and systemic risk factors is feasible, safe and effective. It avoids unnecessary curettage in around one-third of patients and reduces overtreatment.

1. Introduction

With population aging, an increasing number of women reach menopause with an intrauterine device (IUD) still in situ. Copper IUDs are among the most widely used long-acting contraceptives worldwide, and women who had a device inserted in their forties may retain it well beyond the onset of menopause [1]. Postmenopausal estrogen deficiency results in endometrial atrophy, cervical stenosis and uterine cavity constriction, which increases the technical difficulty of intrauterine device (IUD) removal [2]. Meanwhile, the possibility of concomitant endometrial hyperplasia or malignant lesions highlights the clinical need for endometrial assessment at the time of IUD extraction.

The possibility of coexisting endometrial hyperplasia or carcinoma raises the question of whether the endometrium should be evaluated every time a postmenopausal woman undergoes IUD removal. In some clinical settings, routine diagnostic curettage is performed for all postmenopausal patients to rule out endometrial disease. However, blind curettage of an atrophic, thinned endometrium frequently retrieves little or no diagnostic tissue, exposing patients to unnecessary anesthesia, operative trauma, and consumption of medical resources without a proportional diagnostic gain.

For women with postmenopausal bleeding (PMB), evidence-based triage pathways are well established: an endometrial thickness of 4 mm or less on transvaginal ultrasonography (TVUS) carries a negative predictive value exceeding 99% for endometrial cancer [3–6]. In contrast, for asymptomatic postmenopausal women, major guidelines explicitly state that TVUS should not be used as a screening tool and that an incidentally detected endometrial thickness above a given threshold does not by itself mandate tissue sampling [3, 7]. Notably, no standardized guidance exists regarding endometrial assessment specifically at the time of IUD removal in postmenopausal women.

This retrospective cohort study systematically analyzed baseline clinical data, preoperative transvaginal ultrasound features, and pathological outcomes of 512 postmenopausal patients. We aimed to compare the yield of selective screening versus routine universal curettage, identify risk factors for endometrial lesions, and establish an optimized selective screening model for this population.

2. Materials and Methods

2.1 Study design and population

This retrospective cohort study enrolled women with natural menopause who underwent IUD removal at International Peace Maternity and Child Health Hospital Affiliated to Shanghai Jiao Tong University between January 2023 and December 2023. The study protocol was approved by the Institutional Review Board of International Peace Maternity and Child Health Hospital (ethics approval No. GKLW-A-2025-086-

1). The requirement for informed consent was waived owing to the retrospective nature of this study. This research was performed in accordance with the principles outlined in the Declaration of Helsinki.

The inclusion criteria were: (1) natural menopause with continuous amenorrhea of ≥ 12 months and age ≥ 45 years; (2) a non-hormonal copper IUD in situ; and (3) complete clinical records, preoperative TVUS data, operative notes, and pathological reports. The exclusion criteria were: (1) use of a levonorgestrel-releasing intrauterine system; (2) iatrogenic menopause secondary to bilateral oophorectomy or chemoradiotherapy; (3) a preoperative diagnosis of endometrial polyp, hyperplasia, or uterine malignancy; (4) a history of curettage or hysteroscopic surgery; (5) severe systemic disease precluding completion of surgery; and (6) missing clinical or imaging data.

2.2 Grouping and screening protocol

According to the presence or absence of AUB — defined as any vaginal bleeding occurring after ≥ 12 months of amenorrhea [8] — patients were divided into a bleeding (AUB) group (n = 128) and a non-bleeding group (n = 384). All patients in the AUB group underwent endometrial sampling at the time of IUD removal. In the non-bleeding group, sampling was performed only in the presence of at least one high-risk TVUS finding: endometrial thickness > 8 mm, heterogeneous endometrial echogenicity, or uterine cavity effusion (n = 218). Asymptomatic patients with normal TVUS findings underwent IUD removal alone, without curettage (n = 166). Endometrial sampling was performed by blind dilatation and curettage or pipelle biopsy at the surgeon's discretion; a dedicated flow diagram of patient selection and grouping is shown in Fig. 1. This protocol represents the selective screening strategy evaluated in the present study, as opposed to routine universal curettage applied to all patients.

2.3 Observed variables and definitions

Baseline variables included age, menopausal duration, body mass index (BMI), history of diabetes mellitus, hormone replacement therapy (HRT), and tamoxifen use. Ultrasound variables included endometrial thickness, endometrial echo uniformity, uterine cavity effusion, and IUD embedding status. TVUS variables included endometrial thickness (double-layer measurement in the sagittal plane), endometrial echogenicity (uniform vs. heterogeneous), uterine cavity effusion, and IUD position (normal, partial incarceration, or marked incarceration). Pathological outcomes were classified according to the World Health Organization classification [9] as atrophic endometrium, endometrial polyp, chronic endometritis, endometrial hyperplasia without atypia, atypical hyperplasia/endometrial intraepithelial neoplasia, and endometrial carcinoma. An “invalid specimen” was defined as material containing no evaluable endometrial tissue (e.g., mucus or cervical tissue only). The composite endpoint of “significant endometrial lesion” comprised endometrial hyperplasia with or without atypia and endometrial carcinoma.

2.4 Statistical analysis

SPSS 26.0 software was used for statistical analysis. Continuous variables were expressed as mean ± standard deviation and compared by independent-samples t-test. Categorical variables were presented

as counts (percentages) and compared by χ^2 test. A P-value < 0.05 was considered statistically significant. Given the retrospective design and the modest number of outcome events, the analyses were exploratory in nature and no multivariable model was fitted.

3. Results

3.1 Baseline clinical characteristics

The mean age of the 512 patients was 55.4 ± 5.8 years, and the overall prevalence of postmenopausal AUB was 25.00% (128/512). As shown in Table 1, the AUB group had a significantly higher BMI (24.1 ± 3.5 vs. 23.4 ± 3.3 kg/m², P = 0.044) and a higher proportion of overweight women (BMI ≥ 24 kg/m²: 51.56% vs. 41.41%, P = 0.040). The prevalences of diabetes mellitus (17.97% vs. 9.90%, P = 0.009) and HRT history (9.38% vs. 3.65%, P = 0.005) were also significantly higher in the AUB group. The tamoxifen exposure (3.91% vs. 1.30%, P = 0.048) was also significantly higher in the AUB group. The AUB group showed significantly higher proportions of diabetes, HRT exposure, and tamoxifen use compared with the non-bleeding group (P < 0.05). No significant between-group differences were observed in age (P = 0.190) or menopausal duration (P = 0.098).

Table 1
Baseline clinical characteristics of the 512 postmenopausal patients

Characteristic	AUB group (n = 128)	Non-AUB group (n = 384)	Statistic	P value
Age (years), mean ± SD	56.1 ± 6.2	55.2 ± 5.6	t = 1.312	0.190
Age group, n (%)			χ^2 = 0.876	0.645
45–50 years	16 (12.50)	61 (15.89)		
51–60 years	82 (64.06)	251 (65.36)		
> 60 years	30 (23.44)	72 (18.75)		
Menopausal duration, n (%)			χ^2 = 2.741	0.098
1–5 years	72 (56.25)	245 (63.80)		
> 5 years	56 (43.75)	139 (36.20)		
BMI (kg/m²), mean ± SD	24.1 ± 3.5	23.4 ± 3.3	t = 2.015	0.044
BMI category, n (%)			χ^2 = 4.218	0.040
< 24 kg/m²	62 (48.44)	225 (58.59)		
≥ 24 kg/m²	66 (51.56)	159 (41.41)		
Diabetes mellitus, n (%)	23 (17.97)	38 (9.90)	χ^2 = 6.882	0.009
HRT history, n (%)	12 (9.38)	14 (3.65)	χ^2 = 8.027	0.005
Tamoxifen use, n (%)	5 (3.91)	5 (1.30)		0.048

Note: Data are mean ± SD or n (%). AUB, abnormal uterine bleeding; BMI, body mass index; HRT, hormone replacement therapy. Comparisons by independent-samples t-test or chi-square test.

3.2 Preoperative transvaginal ultrasound findings

As shown in Table 2, patients with AUB had significantly higher rates of endometrial thickening, heterogeneous endometrial echogenicity, and uterine cavity effusion (all P < 0.001). In the AUB group, 21.88% of patients had an endometrial thickness > 8 mm, compared with 5.99% in the non-AUB group. No significant difference in IUD position was found between the two groups (P = 0.121), indicating that IUD incarceration was not associated with endometrial pathological changes.

Table 2
Comparison of preoperative transvaginal ultrasound findings between the AUB and non-AUB groups

Ultrasound finding	AUB group (n = 128)	Non-AUB group (n = 384)	χ^2 value	P value
Endometrial thickness, n (%)			68.721	< 0.001
≤ 5 mm	48 (37.50)	285 (74.22)		
5–8 mm	52 (40.63)	76 (19.79)		
> 8 mm	28 (21.88)	23 (5.99)		
Endometrial echogenicity, n (%)			59.114	< 0.001
Uniform	72 (56.25)	334 (86.98)		
Heterogeneous	56 (43.75)	50 (13.02)		
Uterine cavity effusion, n (%)			15.027	< 0.001
Absent	92 (71.88)	333 (86.72)		
Present	36 (28.13)	51 (13.28)		
IUD position, n (%)			4.218	0.121
Normal	88 (68.75)	294 (76.56)		
Partial incarceration	32 (25.00)	70 (18.23)		
Marked incarceration	8 (6.25)	20 (5.21)		

Note: AUB, abnormal uterine bleeding; IUD, intrauterine device.

3.3 Pathological outcomes of endometrial sampling

A total of 346 patients underwent endometrial sampling (all 128 AUB patients and 218 asymptomatic patients with high-risk TVUS findings). The overall detection rate of significant endometrial lesions was 10.40% (36/346). The detection rate was numerically higher in the bleeding group than in the asymptomatic high-risk ultrasound group (14.06% vs. 8.26%; $\chi^2 = 2.916$, $P = 0.088$). Endometrial hyperplasia without atypia was found in 11 AUB patients (8.59%) and 14 asymptomatic patients (6.42%); atypical hyperplasia in 4 (3.13%) and 3 (1.38%); and endometrial carcinoma in 3 (2.34%) and 1 (0.46%), respectively (Table 3). Most lesions detected in the asymptomatic high-risk group were hyperplasia without atypia; nevertheless, 4 of 218 (1.83%) had atypical hyperplasia or carcinoma.

Table 3
Pathological outcomes of the 346 patients who underwent endometrial sampling

Pathological diagnosis	AUB group (n = 128)	Non-AUB high-risk ultrasound group (n = 218)
Atrophic endometrium	54 (42.19)	126 (57.80)
Endometrial polyp	32 (25.00)	58 (26.61)
Chronic endometritis	8 (6.25)	6 (2.75)
Invalid specimen (no valid endometrial tissue)	16 (12.50)	10 (4.59)
Endometrial hyperplasia without atypia	11 (8.59)	14 (6.42)
Atypical hyperplasia / EIN	4 (3.13)	3 (1.38)
Endometrial carcinoma	3 (2.34)	1 (0.46)
Significant endometrial lesion (hyperplasia ± atypia + carcinoma)	18 (14.06)	18 (8.26)
No significant lesion (benign + invalid specimen)	110 (85.94)	200 (91.74)

Note: The composite endpoint of significant endometrial lesion comprised endometrial hyperplasia with or without atypia and endometrial carcinoma. The detection rates of significant lesions differed numerically between groups (14.06% vs. 8.26%) but not significantly ($\chi^2 = 2.916$, $P = 0.088$). EIN, endometrial intraepithelial neoplasia.

Regarding specimen quality, valid endometrial tissue was obtained in 320 of 346 sampled patients (92.49%). Blind curettage yielded invalid specimens (mucus or cervical tissue only) in 26 patients (7.51%), with a significantly higher failure rate in the bleeding group than in the asymptomatic high-risk group (12.50% vs. 4.59%; $\chi^2 = 7.266$, $P = 0.007$; Table 4), highlighting the limited diagnostic yield of blind scraping in atrophic postmenopausal endometrium.

Table 4
Specimen quality of endometrial sampling (N = 346)

Specimen quality	AUB group (n = 128)	Non-AUB high-risk group (n = 218)	Total (N = 346)
Valid endometrial tissue obtained	112 (87.50)	208 (95.41)	320 (92.49)
No valid endometrial tissue (mucus/cervical tissue only)	16 (12.50)	10 (4.59)	26 (7.51)

Note: $\chi^2 = 7.266$, $P = 0.007$ for the comparison of invalid specimen rates between the AUB and non-AUB high-risk groups.

3.4 The low-risk asymptomatic subgroup

One hundred sixty-six asymptomatic patients (32.4% of the entire cohort) had normal TVUS findings and no sampling performed. In this low-risk subgroup, IUD removal was completed without curettage-related complications, and no cases presented with delayed-diagnosis endometrial disease during the available follow-up period. Asymptomatic patients with normal ultrasound, without diabetes or hormone exposure, had an extremely low risk of severe endometrial lesions, suggesting negligible clinical benefit from routine curettage in this subgroup.

4. Discussion

4.1 Abnormal uterine bleeding as the key warning marker

Consistent with previous reports that approximately 90% of endometrial cancers present with postmenopausal bleeding [5, 10], AUB was the strongest single clinical indicator of endometrial pathology in our cohort: the detection rate of significant lesions was 14.06% in bleeding patients, and all bleeding patients exhibited at least one abnormal TVUS feature. Notably, even in asymptomatic individuals, endometrial thickening, heterogeneous echo, or persistent uterine cavity effusion suggests potential endometrial abnormality and warrants selective sampling. Ultrasound effectively stratifies high-risk patients and helps avoid missed diagnoses, thereby providing the imaging basis for a selective rather than routine approach. Therefore, it is supported to implement mandatory sampling for patients with symptoms as well as for asymptomatic patients whose ultrasound examination results are abnormal.

4.2 Value of transvaginal ultrasound in risk stratification

TVUS is a convenient and well-validated first-line tool for postmenopausal endometrial assessment [3–7]. In our study, endometrial thickening, heterogeneous echogenicity, and uterine cavity effusion were each strongly associated with AUB (all $P < 0.001$), and the combination of these soft markers identified an asymptomatic subgroup in which 8.26% harbored significant lesions, including four cases (1.83%) of atypical hyperplasia or carcinoma. For asymptomatic women we adopted a conservative thickness threshold of > 8 mm for sampling — higher than the 4–5 mm thresholds validated in women with PMB [3, 6, 11] — because a negative ultrasound in an asymptomatic woman carries different implications from that in a woman with bleeding [7, 12]. Our findings suggest that echo heterogeneity and intracavitary fluid, which may reflect polyps, focal hyperplasia, or inflammatory pathology missed by thickness measurement alone, are useful complementary triage criteria.

4.3 Systemic metabolic and hormonal risk factors

Obesity, diabetes mellitus, HRT, and tamoxifen therapy are established risk factors for endometrial hyperplasia and carcinogenesis [13–17]. Unopposed estrogenic stimulation and insulin resistance promote abnormal endometrial proliferation even after menopause. Our data confirm significantly higher BMI, diabetes prevalence, and HRT exposure among women with AUB. Tamoxifen exposure was more frequent in the AUB group (3.91% vs. 1.30%). Individualized assessment should be emphasized for these

high-risk subgroups, and a lower threshold for tissue sampling may be justified in tamoxifen users regardless of symptoms [16, 17].

4.4 Selective screening to avoid overtreatment

The present findings support a selective rather than routine strategy. Universal routine curettage for all postmenopausal patients undergoing IUD removal is neither necessary nor cost-effective. In our cohort, 7.51% of all blind curettage specimens contained no evaluable endometrial tissue, and the failure rate reached 12.50% in the bleeding group, in whom the endometrium was presumably the most atrophic. These invalid procedures brought patients discomfort and medical waste without any diagnostic return. In contrast, restricting endometrial sampling to patients with postmenopausal bleeding, abnormal endometrial ultrasound findings, diabetes, obesity, or hormone-related exposure identifies the vast majority of premalignant and malignant lesions while sparing low-risk individuals from an unnecessary procedure. By applying the selective algorithm, 166 of 512 patients (32.4%) — asymptomatic women with normal TVUS and no high-risk factors — were safely spared curettage. When sampling is indicated in women with a thinned, atrophic endometrium, visually directed hysteroscopic biopsy may be preferable to blind curettage, given its higher diagnostic accuracy [18–20].

This study supports a stratified selective screening strategy:

- **Mandatory endometrial sampling**: patients with postmenopausal bleeding, abnormal endometrial ultrasound findings, diabetes, obesity, or hormone-related exposure.
- **No routine curettage**: asymptomatic patients with normal ultrasound and no high-risk factors.

4.5 Limitations

This study has several limitations. First, its retrospective, single-center design carries inherent selection and information bias. Second, the 166 low-risk patients who did not undergo sampling lack histological verification of the endometrium, so the safety of withholding curettage in this subgroup is inferred rather than proven; prospective validation with structured follow-up is needed. Third, the numbers of HRT and tamoxifen users were small, limiting the power to detect associations with endometrial lesions. Finally, the sample size of malignant lesions was relatively small, limiting multivariate modeling of rare outcomes. Multi-center prospective studies with longer follow-up are needed to validate the proposed selective screening algorithm.

5. Conclusions

In postmenopausal women undergoing IUD removal, AUB, abnormal TVUS findings (endometrial thickening, heterogeneous echogenicity, uterine cavity effusion), obesity, diabetes mellitus, and hormone-related medication history identify patients at increased risk of significant endometrial lesions. Routine universal diagnostic curettage is not recommended for unselected postmenopausal patients. The selective endometrial screening strategy based on clinical symptoms, transvaginal ultrasound

findings, and systemic risk factors is precise, safe and cost-effective, enabling the reduction of overtreatment in clinical practice. Integrating these indicators, this risk-stratified approach is feasible; prospective long-term follow-up studies are required to confirm its safety profile.

Declarations

Ethics approval and consent to participate:

The study protocol was approved by the Institutional Review Board of International Peace Maternity and Child Health Hospital Affiliated to Shanghai Jiao Tong University (approval No. GKLW-A-2025-086-1).

Consent for publication:

Not applicable.

Competing interests:

The authors declare that they have no competing interests.

Authors' contributions

Chen Lu, Yue Weng, Hongxia Zhu, Haiqian Lu and Huihui Pan were involved in data acquisition, statistical analysis, literature review and manuscript drafting. Zhida Qian conceived and designed the study, critically revised the manuscript, and approved the final version of the manuscript for submission. All authors meet the ICMJE authorship criteria, read and approved the final manuscript.

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Availability of data and materials:

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

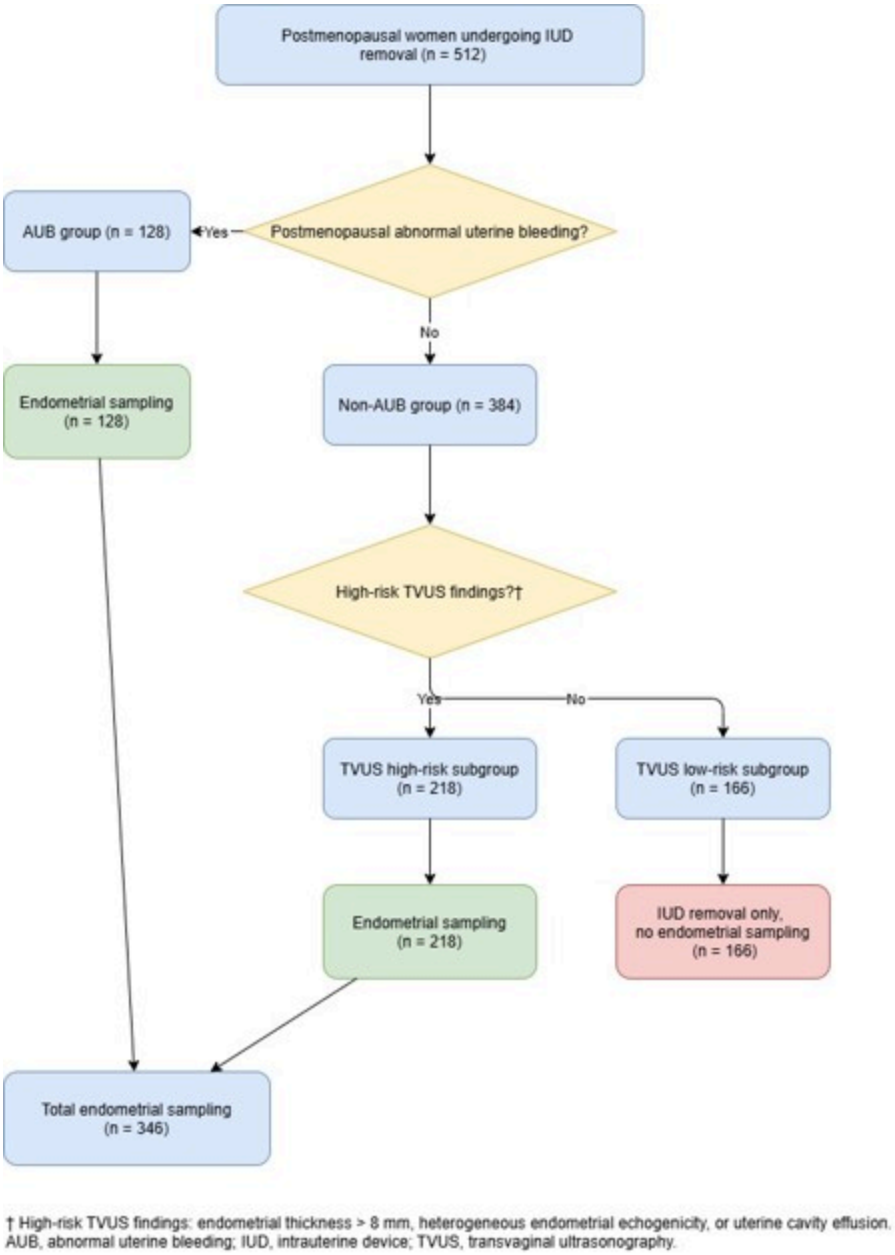
References

1. Crosbie EJ, Kitson SJ, McAlpine JN, Mukhopadhyay A, Powell ME, Singh N. Endometrial cancer. Lancet. 2022;399(10333):1412–28.

2. Buhling KJ, Zite NB, Lotke P, Black K, INTRA Writing Group. Worldwide use of intrauterine contraception: a review. Contraception. 2014;89(3):162–73.
3. ACOG Committee Opinion No. 734: The role of transvaginal ultrasonography in evaluating the endometrium of women with postmenopausal bleeding. Obstet Gynecol. 2018;131(5):e124–e129.
4. American College of Obstetricians and Gynecologists. Updated guidance regarding the role of transvaginal ultrasonography in evaluating the endometrium of individuals with postmenopausal bleeding. Obstet Gynecol. 2026;148(1):e87–91.
5. Clarke MA, Long BJ, Del Mar Morillo A, Arbyn M, Bakkum-Gamez JN, Wentzensen N. Association of endometrial cancer risk with postmenopausal bleeding in women: a systematic review and meta-analysis. JAMA Intern Med. 2018;178(9):1210–22.
6. Smith-Bindman R, Kerlikowske K, Feldstein VA, Subak L, Scheidler J, Segal MR, et al. Endovaginal ultrasound to exclude endometrial cancer and other endometrial abnormalities. JAMA. 1998;280(17):1510–7.
7. Smith-Bindman R, Weiss E, Feldstein V. How thick is too thick? When endometrial thickness should prompt biopsy in postmenopausal women without vaginal bleeding. Ultrasound Obstet Gynecol. 2004;24(5):558–65.
8. Munro MG, Critchley HOD, Broder MS, Fraser IS, FIGO Working Group on Menstrual Disorders. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynaecol Obstet. 2011;113(1):3–13.
9. WHO Classification of Tumours Editorial Board. Female Genital Tumours. WHO Classification of Tumours. Volume 4, 5th ed. Lyon: IARC; 2020.
10. Karlsson B, Granberg S, Wikland M, Ylostalo P, Torvid K, Marsal K, et al. Transvaginal ultrasonography of the endometrium in women with postmenopausal bleeding: a Nordic multicenter study. Am J Obstet Gynecol. 1995;172(5):1488–94.
11. Gull B, Karlsson B, Milsom I, Granberg S. Can ultrasound replace dilation and curettage? A longitudinal evaluation of postmenopausal bleeding and transvaginal sonographic measurement of the endometrium as predictors of endometrial cancer. Am J Obstet Gynecol. 2003;188(2):401–8.
12. Goldstein RB, Bree RL, Benson CB, Benacerraf BR, Bloss JD, Carlos R et al. Evaluation of the woman with postmenopausal bleeding: Society of Radiologists in Ultrasound-sponsored consensus conference statement. J Ultrasound Med. 2001;20(10):1025–1036.
13. Calle EE, Rodriguez C, Walker-Thurmond K, Thun MJ. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. N Engl J Med. 2003;348(17):1625–38.
14. Beral V, Million Women Study Collaborators. Endometrial cancer and hormone-replacement therapy in the Million Women Study. Lancet. 2005;365(9470):1543–51.
15. Nead KT, Sharp SJ, Thompson DJ, Painter JN, Savage DB, Semple RK, et al. Evidence of a causal association between insulinemia and endometrial cancer: a Mendelian randomization analysis. J Natl Cancer Inst. 2015;107(9):djv178.

16. Fisher B, Costantino JP, Wickerham DL, Redmond CK, Kavanah M, Cronin WM, et al. Tamoxifen for prevention of breast cancer: report of the National Surgical Adjuvant Breast and Bowel Project P-1 Study. J Natl Cancer Inst. 1998;90(18):1371–88.
17. Kedar RP, Bourne TH, Powles TJ, Collins WP, Ashley SE, Cosgrove DO, et al. Effects of tamoxifen on uterus and ovaries of postmenopausal women in a randomised breast cancer prevention trial. Lancet. 1994;344(8934):1318–21.
18. Clark TJ, Voit D, Gupta JK, Hyde C, Song F, Khan KS. Accuracy of hysteroscopy in the diagnosis of endometrial cancer and hyperplasia: a systematic quantitative review. JAMA. 2002;288(13):1610–21.
19. Lacey JV Jr, Ioffe OB, Ronnett BM, Rush BB, Richesson DA, Chatterjee N, et al. Endometrial carcinoma risk among women diagnosed with endometrial hyperplasia: the 34-year experience in a large health plan. Br J Cancer. 2008;98(1):45–53.
20. The Menopause and Hormone Therapy Expert Group of the Chinese Society of Obstetrics and Gynecology. Guidelines for menopausal hormone therapy (2023 edition). Chin J Obstet Gynecol. 2023. [in Chinese].

Figures



† High-risk TVUS findings: endometrial thickness > 8 mm, heterogeneous endometrial echogenicity, or uterine cavity effusion.
AUB, abnormal uterine bleeding; IUD, intrauterine device; TVUS, transvaginal ultrasonography.

Figure 1

Flow diagram of patient selection, grouping, and the selective endometrial screening strategy. AUB, abnormal uterine bleeding; TVUS, transvaginal ultrasonography.