

Hysteroscopic assessment of postmenopausal endometrial thickening

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Abstract

Introduction: Endometrial thickness is measured by transvaginal sonography and thickening indicates an increased risk of malignancy or other pathology (hyperplasia or polyp) in the postmenopausal period. The main screening methods for the uterine cavity are dilatation and curettage, and hysteroscopy. We sought to correlate hysteroscopic and pathological findings in asymptomatic postmenopausal women with sonographically thickened endometrium (> 5 mm) in this study.

Material and methods: This retrospective cross-sectional study involved case records of 197 women who have thickened (> 5 mm) endometrium in the postmenopausal period. All these women underwent hysteroscopy with diagnostic dilatation and curettage between January 2012 and January 2013 at the Bursa Zübeyde Hanım Maternity Hospital. Sensitivity, specificity, positive, negative predictive values and *p* value of hysteroscopy were calculated. Dilatation and curettage was set as the gold standard.

Results: For the evaluation of postmenopausal thickened endometrium, hysteroscopy revealed sensitivity, specificity, positive predictive value and negative predictive value as 76.4%, 76.9%, 73.1%, 79.8%, respectively.

Conclusions: Hysteroscopy is a fast and accurate technique in evaluation of the intrauterine space occupying lesions (polyp, fibroid) but only moderate for endometrial hyperplasia. Hysteroscopic view combined with direct biopsy could be a gold standard for endometrial assessment.

Key words: hysteroscopy, menopause, dilatation and curettage, endometrial hyperplasia.

Introduction

Endometrial cancer is the most prevalent type of malignant neoplasm of the genital tract [1]. It occurs primarily after menopause and in most cases presents with vaginal bleeding. Postmenopausal thickened endometrium indicates an increased risk of malignancy or other pathology (hyperplasia or polyp) [2]. Thickened endometrium (endometrial thickness > 5 mm) in the postmenopausal period should be considered. The main screening methods for the uterine cavity are dilatation and curettage (D&C), and hysteroscopy.

Hysteroscopy has been introduced into practice for the assessment of endometrium, with an easy, fast and accurate method to detect intrauterine pathology [3]. Dilatation and curettage is still the gold standard method for endometrial assessment [4]. But in developing medicine, blind curettage does not seem to be accurate, sensitive and specific enough. Hysteroscopy is a dynamic exam that may be performed in an outpatient setting which allows a direct view of the endometrium.

We sought to correlate hysteroscopic impression and pathological findings in asymptomatic postmeno-

pausal women with sonographically thickened endometrium (> 5 mm) in this study.

Material and methods

This is a retrospective cross-sectional study involving case records of 207 women who were referred to the menopause clinic of the Bursa Zübeyde Hanım Maternity Hospital, Department of Gynecology between January 2012 and January 2013. Menopause was defined as spontaneous cessation of menses for one year or more. The patients first underwent a standard outpatient evaluation. Ten of these patients were excluded because of hormonal replacement therapy, cervical pathology or tamoxifen usage. One hundred and ninety seven patients were evaluated for several parameters: age, gravida, body mass index, hysteroscopic impressions, complications and histopathological diagnosis.

Every patient was offered a TVS (9 MHz transvaginal probe, Esaote Technos^{MPX}, ESAOTE Biomedica Medical Systems LTD SCI, Istanbul, Turkey). During transvaginal ultrasonography, maximum endometrial thickness was the distance (mm) from one myometrial/endometrial

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interface to the other, in the sagittal plane across the cavity of the uterus. A thickness of > 5 mm for postmenopausal patients was used to indicate the possible presence of intrauterine pathologies.

All office hysteroscopies were performed by the two most experienced (min. 5 years) operators for the vaginoscopic technique. Office hysteroscopy using a continuous flow Storz 3-mm telescope with a 30° fore-oblique lens (Karl Storz GmbH, Tuttlingen, Germany) was performed without tenaculum and speculum. Moreover, no sedation or local anesthetics were used. Illumination was provided by a high intensity xenon cold-light source. The patient was placed in the lithotomy position, a gynecologic exploration was performed to assess the size and position of the uterus as well as the characteristics of the cervix. The uterine cavity was distended with a 0.9% saline solution (HysteRo-Purator, WISAP, Munich, Germany) pressure at a flow rate of 30-45 ml/min with intraluminal pressure of 50-100 mmHg. The endometrial surface was inspected systematically, and the tubal ostia were identified. The hysteroscope was then pulled back towards the internal uterine orifice to obtain a panoramic view of the whole cavity. The endocervical canal was inspected during withdrawal of the hysteroscope. Impressions of hysteroscopy were evaluated according to Table I.

After the hysteroscopic procedure, blind fractional D&C was performed to all patients under general anesthesia. The material was fixed in 10% formalin, prepared for paraffin embedding and stained with hematoxylin and eosin (H&E), the final material was sent for histological analysis. Histologic diagnosis was given by an associate pathologist who was blinded to the ultrasonographic and hysteroscopic findings, as atrophy, endometrial polyp, adenomyoma, endometrial hyperplasia or proliferative endometrium.

Data were processed by a statistics programme for social scientists for Windows 16.0. Histologic diagnoses were compared to the hysteroscopic findings by using 2-way Contingency Table Analysis and Yates' correlation test and the sensitivity, specificity positive predictive value, and negative predictive value were calculated.

Tab. I. Hysteroscopic appearance of endometrium

Hysteroscopic view	Hysteroscopic diagnose
Smooth surfaced and covered with endometrium	Normal cavity
Pedicle mass covered with endometrium	Endometrial polyp
Pedicle bright mass un-covered with endometrium	Submucosal fibroid
Thickened endometrium with irregular surface	Endometrial hyperplasia
Thickened endometrium with endometrial necrosis	Endometrial carcinoma

The study was approved by the local ethics committee.

Results

One hundred and ninety-seven women were evaluated in this study. Mean age was 55.2 ± 7.6 (41-79) and they were postmenopausal for average 6.5 ± 3.1 years. Mean body mass index was 30.2 ± 4.7 . No pre-malignant or malignant lesion was found in patients presenting endometrial thickness < 9 mm on ultrasound. The characteristics of the study group are listed in Table II. No complication occurred among the hysteroscopy or D&C.

Endometrial polyp ($n = 76$, 38.5%) was the most common endometrial abnormality in hysteroscopic impression. Endometrial hyperplasia was identified in 30 (15.2%), submucosal fibroid was in 17 (8.6%) and normal cavity was in 74 (37.7%) of 197 consecutive postmenopausal women undergoing hysteroscopy.

After the hysteroscopy, D&C was performed to all patients. Dilatation and curettage findings were atrophy in 108 (55%), endometrial polyp in 65 (33%), adenomyoma in 10 (5%), endometrial hyperplasia in 11 (5.5%), endometrial intraepithelial neoplasia (EIN) in 1 (0.5%) and endometrial carcinoma in 2 (1%) consecutive postmenopausal women with thickened endometrium (Table III).

Endometrial polyp was the most common endometrial pathology in assessment of postmenopausal endometrial thickening for both methods.

Thirty women had irregular endometrium by hysteroscopic impression; 10 of them had simple endometrial hyperplasia, 1 of them had EIN and 2 of them had endometrial carcinoma in pathological assessment.

Hysteroscopy diagnosed all intrauterin space occupying lesions (76 endometrial polyp, 17 submucosal fibroid) but D&C missed 25 of these women (atrophy).

In the evaluation of postmenopausal thickened endometrium, hysteroscopy revealed a sensitivity of 76.4%, specificity of 76.9%, positive predictive value (PPV) of 73.1%, negative predictive value (NPV) of 79.8% and $p < 0.001$. For the specific pathologies, PPV, NPV, sensitivity, specificity and p value are shown in Table IV.

Tab. II. Demographic characteristics ($n = 197$)

Age	55.2 ± 7.6
Gravida	3.7 ± 2.0
Years after menopause	6.5 ± 3.1
Body mass index	30.2 ± 4.7
Endometrial thickness	8.3 ± 3.1
Hypertension	57 (28.9%)
Diabetes	79 (40.1%)

Tab. III. Hysteroscopic findings and dilatation and curettage results of patient group

Dilatation and curettage	Atrophy (n = 108)	Endometrial polyp (n = 65)	Adenomyoma (n = 10)	Endometrial hyperplasia (n = 11)	Endometrial intraepithelial neoplasia (n = 1)	Endometrial carcinoma (n = 2)
Hysteroscopy						
Normal cavity (n = 74)	73 (99.6%)	–	–	1 (1.4%)	–	–
Endometrial hyperplasia (n = 30)	10 (33.2%)	7 (23.3%)	–	10 (33.3%)	1 (3.6%)	2 (6.6%)
Endometrial polyp (n = 76)	17 (22.3%)	57 (75%)	2 (2.7%)	–	–	–
Submucosal fibroid (n = 17)	8 (47%)	1 (6%)	8 (47%)	–	–	–

Tab. IV. Diagnostic accuracy of hysteroscopy in postmenopausal thickened endometrium

Dilatation and curettage	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	LR (+)	LR (-)
Endometrial polyp	87.7	85.6	75.0	93.4	6.09	0.14
Adenomyoma	80	95.2	47.1	98.9	16.62	0.21
Endometrial hyperplasia	91.7	89.7	36.7	99.4	8.92	0.09

χ² test, Yeates correlation

PPV – positive predictive values, NPV – negative predictive values

Discussion

The evaluation of postmenopausal thickened endometrium still raise controversies. Evaluation is traditionally based on histological diagnosis established through dilatation and curettage to exclude endometrial carcinoma. However, because these diagnostic procedures do not detect all endometrial abnormalities and D&C is an invasive procedure requiring local or general anesthesia, hysteroscopy has been introduced as a new method for the evaluation of endometrial cavity. When blind endometrial biopsies are carried out, the diagnosis of endometrial polyps can be missed, which may lead to underdiagnosis of this pathology during menopause [5, 6]. And also as an inevitable disadvantage, the possible underdiagnosis of polyps by blind endometrial biopsies can be reduced by this new technique.

In our study, we evaluated 197 women submitted to hysteroscopy after sonographic diagnosis of endometrial thickening and comparing hysteroscopic impression and histopathological findings. The most frequent hysteroscopic and histopathological diagnosis was endometrial polyp in both groups (38.5% and 33%). Hysteroscopic impression and pathological results were concordant in 148 (75.1%) patients. Gan *et al.* reported similar results (88.8%) for concordance between hysteroscopy and pathology [7].

Loizzi *et al.* reported a rate of 28% of endometrial pathology in a group of 129 asymptomatic women with thickened endometrium [8]. In our study, asymptomatic patients had a higher pathology rate (37.7%).

Our study used histological diagnosis as the gold standard and assessed the accuracy of hysteroscopy

in postmenopausal endometrial thickness. The results revealed that hysteroscopy was more sensitive and specific for intrauterine space occupying lesions (87.7%, 85.6% for polyp; 80%, 95.2% for fibroid). Chang calculated the efficacy of the hysteroscopic diagnosis and compared with the histopathologic results, and found that the diagnostic accuracy of hysteroscopy was 74% in comparison with a traditional histopathologic examination [9]. Similar results have been reported by various studies exhibiting high sensitivity and specificity for intrauterine space occupying lesions [7, 10]. Similarly, accuracy of hysteroscopy was 76.4% in our study.

Among the diagnostic methods for evaluation of endometrial thickness, hysteroscopy has the highest diagnostic efficacy. For hysteroscopic diagnosis of endometrial polyps, a study performed by Cepni *et al.* showed a sensitivity of 94% [11]. Small uterine lesions or benign endometrial thickness in the endometrium may result in failure to identify focal lesions (especially hyperplasia) during hysteroscopic evaluation. Furthermore, malignant endometrial neoplasms may co-exist with findings of benign endometrial polyps.

Providing evidence that allows it to be concluded that histological sample collection is not essential when the hysteroscopic appearance is normal.

In the present study, only one of the patients presenting normal hysteroscopy results who subsequently underwent dilatation and curettage was diagnosed with hyperplasia. This reinforces the advantage of hysteroscopy in detecting hyperplasia with high sensitivity (94.4%) and specificity (97%). Garuti *et al.* [12] reported 61.6% sensitivity and 79.4% PPV in 189 postmenopausal

sal thickened endometrium and Gan *et al.* reported 64.4% sensitivity and 82.9% PPV similarly [7]. This method alone is not sufficient to exclude the need for additional histological evaluation in suspected cases. In order to exclude hyperplasia, a pathologic assessment is warranted in all hysteroscopies showing an irregularly lined endometrium. We diagnosed 10 endometrial hyperplasia, 1 EIN and 2 endometrial carcinoma in 30 patients who were diagnosed with endometrial hyperplasia in hysteroscopic impression. One patient with endometrial hyperplasia was misdiagnosed by hysteroscopy in our study. Deckardt *et al.* found 10 cases of undetected endometrial carcinoma among 1286 patients who underwent hysteroscopy without biopsy, and in these cases the diagnosis was made by subsequent dilatation and curettage [13]. Every irregularly lined endometrium must be assessed histopathologically.

For the diagnosis of endometrial hyperplasia in the absence of focal lesions, the specificity of hysteroscopy was 87% [14]. In our study, similarly, specificity was 94% for the endometrial hyperplasia.

Conclusions

Endometrial thickening in postmenopausal period means a higher risk of endometrial neoplasia and hyperplasia. Current hysteroscopic technology enables a rapid, safe, tolerable, and effective ambulatory technique which offers an opportunity to establish the diagnosis, especially for intrauterine space occupying lesions.

This study showed that hysteroscopy is sensitive for intrauterine space occupying lesions in postmenopausal women with thickened endometrium. But if you detect endometrial irregularity in hysteroscopy, you have to be careful about endometrial hyperplasia and malignancy.

Disclosure

Authors report no conflict of interest.

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