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Research Article

Comparing Pipelle and Hysteroscopy with Abrasion in Malignant and Premalignant Endometrial Findings

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Abstract

Introduction: Hysteroscopy and abrasion (D&C) are the gold standard of endometrial diagnostics. However, various instruments are available today, including the Pipelle instrument. The diagnostic procedures such as using a Pipelle in the symptomatic patient show comparable positive and negative predictive values in the diagnosis of endometrial carcinoma as D&C with hysteroscopy in smaller studies.

Method and Material: Between February 2016 and December 2020, a total of 266 patients with a bleeding disorder and/or with a sonographically suspicious endometrium who were referred to our department for a hysteroscopy with D&C were examined simultaneously with the Pipelle method. Before each procedure, patients were explicitly informed and gave consent about the study.

A subgroup analysis was performed including only patients with malignant and/or premalignant histological findings from D&C and/or hysterectomy. There were 20 patients in total.

As complex hyperplasia has a higher risk of coexistence with atypical hyperplasia and/or endometrial carcinoma than simple hyperplasia without atypia, it was evaluated separately.

The study was conducted as a double-blind study. The histologic samples obtained (from pipelle and D&C) were sent away separately to the same pathologist. The pipelle material was coded with a specific number without patient data.

Results: The results of the present study show that pipelle sampling for malignant findings is as safe as abrasion to 86%.

Conclusion: Our study shows that this method of sampling is a safe, accurate, cost-effective outpatient procedure with high sensitivity for the detection of atypical endometrial hyperplasia and endometrial carcinoma.

Keywords: Pipelle; Endometrium Carcinoma; Abrasion; HSC; Atypical Endometrial Hyperplasia

Introduction

Endometrial carcinoma (EC) is the 7th most common malignancy in women worldwide, with an annual incidence of 142,000 new cases. Annually, 42,000 women worldwide die from EC. Endometrial carcinomas are most frequently diagnosed between the ages of 75 and 79 [1-3].

The atypical hyperplasia's are precancerous lesions of type 1 carcinoma, i.e. endometrioid adenocarcinoma [4, 6]. Endometrial hyperplasia with atypia has a risk of degeneration to carcinoma of up to 30%. In up to 60%, when the diagnosis of "endometrial hyperplasia with atypia" is made in the specimen or biopsy, coexistence with invasive carcinoma is already present in the hysterectomy specimen [3,7,8]. The group "complex endometrial hyperplasia without atypia" included in the former WHO classification that was abandoned and is now included in the group "endometrial hyperplasia without atypia" (Table 1) [3,7].

Table 1: Classification of endometrial hyperplasia.

WHO classification of endometrial hyperplasia (1994, 2002), modified according to [6].		
Hyperplasia without atypia:	Simple endometrial hyperplasia without atypia	Complex endometrial hyperplasia without atypia (Adenomatous endometrial hyperplasia without atypia)
Atypical hyperplasia:	Simple atypical endometrial hyperplasia	Complex atypical endometrial hyperplasia with atypia (Adenomatous endometrial hyperplasia with atypia) Endometrial Hyperplasia with Atypia)
Current WHO classification [3,7]		
Endometrial hyperplasia without atypia		
Atypical endometrial hyperplasia		

Hysteroscopy and D&C are the gold standard of endometrial diagnostics [9,10]. Nowadays several instruments are available, including the pipelle instrument [11,12]. The diagnostic procedures such as using a pipelle show comparable results in the diagnosis of endometrial carcinoma as hysteroscopy with D&C [2].

Method and Materials

Between February 2016 and December 2020, a total of 266 patients with a bleeding disorder who were referred to our department for a hysteroscopy with D&C (hypermenorrhea, intermenstrual bleeding, continuous bleeding, postmenopausal bleeding) and/or with a sonographically suspicious endometrium were examined simultaneously with the pipelle method. Before each procedure, patients were explicitly informed and gave consent about the study. In the study, no intraoperative complications occurred either during sampling with the pipelle method or during hysteroscopy with D&C.

A subgroup analysis was performed including only patients with malignant and/or premalignant histological findings from curettage and/or hysterectomy. There were 20 patients in total.

Preoperative transvaginal ultrasound diagnostics for endometrial assessment was a mandatory.

The pipette sampling was performed under general anaesthesia as part of the usual planned procedure. After disinfection of the external and internal genital organs and speculum adjustment without hooking and dilatation of the cervix and probing of the uterus (exceptions only in individual cases), the suction curette was introduced through the cervical canal to the fundus uteri. In this phase, the bulb should remain completely advanced. Then the piston was pulled out as far as it would go to achieve an optimal vacuum. The pipelle was pushed back and forth inside the uterus several times with simultaneous rotations in order to obtain samples from all areas of the cavity. It was then pulled out of the uterus completely. This was followed by the scheduled hysteroscopy and D&C.

As complex hyperplasia has a higher risk of coexistence with atypical hyperplasia and/or endometrial carcinoma than simple hyperplasia without atypia, it was evaluated separately.

The study was conducted as a double-blind study. The histologic samples obtained (from pipelle and D&C) were sent away separately to the same pathologist. The pipelle material was coded with a specific number without patient data.

Results

All patients were between the ages of 34 and 97, with the majority of patients between 51 and 60 years old (Figure 1).

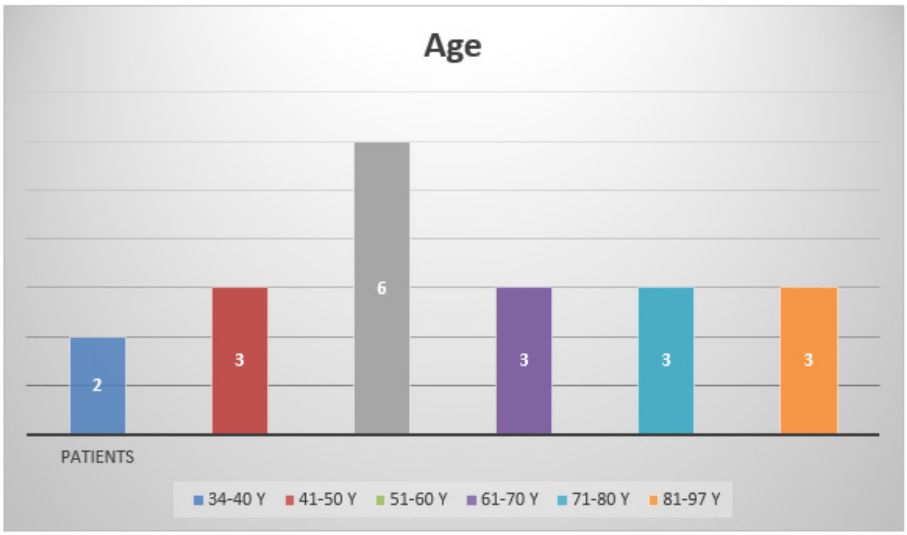

Figure 1: Age groups of the patients.

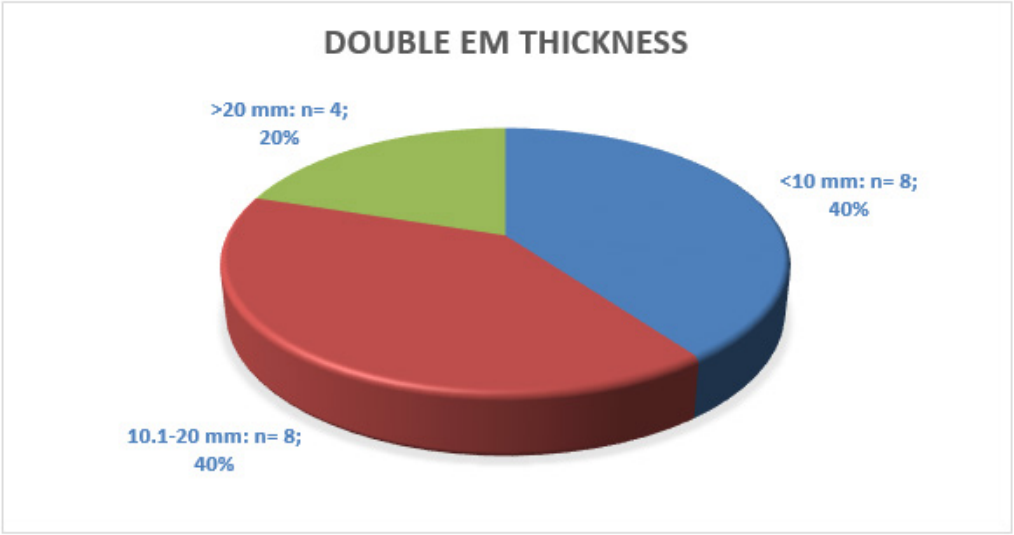

Figure 2: Overview of patients depending on double endometrial (EM) thickness.

Fifteen patients were postmenopausal (75%), three patients (15%) perimenopausal and two patients (10%) premenopausal. The indications for D&C with hysteroscopy were postmenopausal bleeding in 14 cases, intermenstrual bleeding in two cases, hypermenorrhea and continuous bleeding in two cases and sonographically highly developed endometrium in postmenopausal patients in two cases. The patients were divided into three groups depending on the thickness of the endometrium (Figure 2).

Table 2: An overview of findings taking into account menopausal status, endometrial thickness and histological findings.

N	Meno-pause status	Double EM Thick-ness	Pipelle	Curettage	Uterus
1	Premenopause	7 mm	Endometrial carcinoma	Endometrial carcinoma	Due to the existing desire to have children, a progestogen therapy was carried out.
2	Premenopause	19 mm	Atypical endometrial hyperplasia	Atypical endometrial hyperplasia	Due to the existing desire to have children, a progestogen therapy was carried out.
3	Perimenopause	23 mm	Atypical endometrial hyperplasia	Atypical endometrial hyperplasia	Atypical endometrial hyperplasia
4	Perimenopause	8 mm	Endometrium in secretion phase	Endometrium in secretion phase	Endometrial carcinoma (Hysterectomy was planned for bleeding disorder)
5	Perimenopause	6 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
6	Postmenopause	13 mm	No atypia	Endometrial carcinoma	Endometrial carcinoma
7	Postmenopuase	16 mm	Endometrial hyperplasia without atypia (complex EM hyperplasia)	Endometrial carcinoma	Endometrial carcinoma
8	Postmenopause	28 mm	Sparse EM-portions with focal strong decidual stromal reaction. Suspicious findings	Cx: necrotic tissue parts. Suspicious findings	Intramurally developed endometrial stromal sarcoma.
9	Postmenopause	6 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
10	Postmenopause	14 mm	No atypia	Focal endometrial hyperplasia without atypia (complex hyperplasia)	Focal endometrial carcinoma
11	Postmenopause	11 mm	No atypia	Focal atypical endometrial hyperplasia	Focal endometrial hyperplasia without atypia (complex hyperplasia)
12	Postmenopause	8 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
13	Postmenopause	25 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
14	Postmenopause	19 mm	Suspicious finding. Dignity cannot be clearly assessed.	Endometrial carcinoma	Endometrial carcinoma
15	Postmenopause	16 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma

16	Postmenopause	23 mm	Endometrial carcinoma	Endometrial carcinoma	The patient has refused further therapy
17	Postmenopause	6 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
18	Postmenopause	10 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
19	Postmenopause	23 mm	Endometrial carcinoma	Endometrial carcinoma	Endometrial carcinoma
20	Postmenopause	13 mm	Complex hyperplasia	Complex hyperplasia	Endometrial carcinoma

Hysteroscopy results showed that in 11 out of 20 patients the endometrium was suspicious (vascular injection, necrosis), in five out of 20 patients it was unremarkable and in four patients as highly developed.

The accuracy of the pipelle method was 86% for malignant findings and 67% for atypical hyperplasia (Table 3).

Table 3: Summary of the histological findings depending on the endometrial thickness.

Total				<10mm			11-20 mm			>20mm		
Findings	Curettage	Pipelle	Accordance	C	P	A	C	P	A	C	P	A
All findings	17	14	82%	6	6	100%	6	3	50%	5	5	100%
Atypical Hyperplasia	3	2	67%	0	-	-	2	1	50%	1	1	100%
Malignant Findings	14	12	86%	6	6	100%	4	2	50%	4	4	100%

Discussion

Hysteroscopy and D&C are the gold standard of endometrial diagnosis. However, in 60% of cases, only less than half of the endometrium can be obtained; in addition, the surgical risk of general anaesthesia, infection and perforation remain [9,10]. This has led to the need for new and simpler methods for endometrial biopsies. Today, several instruments are available, including the pipelle instrument [11,12]. Like Hysteroscopy with D&C, the pipelle method can be used on an outpatient basis and is less expensive than hysteroscopy with D&C [13]. For the diagnosis of endometrial carcinoma, in symptomatic patients, the positive and negative predictive values for both methods are comparable in smaller studies [2, 21].

In this study, 17 patients had malignant and three patients had premalignant findings (Table 2):

-14 carcinomas were detected using the D&C method and 12 were detected using the pipelle method.

-In 14 cases, histological findings of both methods were identical, 12 of which were malignant and two of which were premalignant.

-In one case, the biopsy with pipette did not show a clear malignant finding, but an unclear dignity was described. This result can be considered as an abnormal finding which may indicate a malignancy. In this case, the statement can be considered positively correct. (Table 2, N 14). In another case, both methods found a suspicious histologic finding, which could be confirmed to be an endometrial stromal sarcoma after a hysterectomy (Table 2, N 8). Since a malignant finding was detected in both cases, the pipelle result in these cases can be considered as a true positive.

After evaluation of the histological malignant findings from the pipelle method and the D&C, the sensitivity of the pipelle in our study is 86% (Table 3).

In two cases, both the biopsy with pipette and the D&C showed identical findings but missed to identify malignant findings. Of these, in two cases (Table 2 N 4 and 20) both the pipelle biopsy and the D&C showed the same findings, but no malignant findings:

-Endometrium in secretory phase. In the subsequent histology of the planned hysterectomy, however, an endometrial carcinoma was described (Table 2, N 4).

-Complex hyperplasia (without atypia). The result after hysterectomy was endometrial carcinoma of the endometrioid type (Table 2, N 20).

-And in one case the pipelle biopsy showed an unremarkable finding and the D&C a complex hyperplasia without atypia. However, a focal adenocarcinoma was found in the post-hysterectomy specimen (Table 2, N 10).

The high sensitivity of the pipelle in endometrial carcinoma has also been described by several authors in the literature (Table 4).

Table 4: Literature overview comparing the accuracy of pipelle method for malignant and premalignant histological findings.

Author	Number of patients	Comparative Findings	Sensitivity	Specificity
Alliratnam, et al.[22]	2	Endometrial carcinoma	100%	100%
Del Priore, et al. [18]	21	Endometrial carcinoma	86%	100%
Fakhar, et al. [13]	2	Endometrial carcinoma	100%	100%
	10	Endometrial hyperplasia with atypia	100%	98%

Guido, et al. [20]	65	Endometrial carcinoma	83%	
Huang, et al. [17]	360	Endometrial carcinoma:		
		1) low differentiated	1) 93,8%	
		2) highly differentiated	2) 99,2%	
Ibrahim, et al. [23]	10	Endometrial carcinoma	100%	100%
	4	Endometrial hyperplasia with atypia	100%	100%
Machado, et al. [16]	168	Endometrial carcinoma, endometrial hyperplasia with atypia	84,2%	
Stovall, et al. [19]	40	Endometrial carcinoma	97,5%	
Piriyev, et al. 2020 [21]	7	Endometrial carcinoma	100%	100%
	2	Endometrial hyperplasia with atypia	100%	100%
Current study	13	Endometrial carcinoma	86%	100%
	3	Endometrial hyperplasia with atypia	67%	100%

The sensitivity of pipelle sampling for atypical hyperplasia in our study is 67%, but the total number is low (Table 3). There were three cases in total. Of these, atypical hyperplasia could be detected with the pipelle in two cases.

In one case, the pipelle showed an unremarkable finding, whereas focal atypical hyperplasia was detected in the histology from the abrasion (Table 2, N 11). In the preparation from the hysterectomy, however, only focal complex hyperplasia without atypia was detected. It can be considered that the focal atypical hyperplasia was completely removed during the D&C.

There are different conclusions about pipelle in endometrial hyperplasia. In one study it was concluded that endometrial biopsy has moderate accuracy in diagnosing endometrial hyperplasia [14]. Another work proved that the pipelle method showed 100% sensitivity in endometrial hyperplasia [15].

It must be emphasized that there was only one case of a false suspect finding in our study. However, a false positive malignant or premalignant finding did not occur.

Summary

The results of the present study show that pipelle sampling for malignant findings is as safe as abrasion to 86%.

Our study shows that this method of sampling is a safe, accurate, cost-effective outpatient procedure with high sensitivity for the detection of atypical endometrial hyperplasia and endometrial carcinoma.

Acknowledgement

None.

Conflict of Interest

Authors declare no conflict of interest.

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