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Original Research Article

To Compare Pipelle Biopsy Report with Hysterectomy/ D&C Histopathology for Endometrial Pathologies

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Abstract:

Introduction: Endometrial pathologies refer to abnormalities affecting the uterine lining, and various sampling techniques are used to diagnose these conditions. Pipelle biopsy is a minimally invasive procedure, while hysterectomy and dilatation and curettage (D&C) are more invasive approaches. Comparing the findings of pipelle biopsy with histopathology from hysterectomy or D&C can provide valuable information for managing endometrial pathologies.

Objective: The objective of this study was to compare pipelle biopsy reports with hysterectomy/D&C histopathology reports and determine the sensitivity and specificity of pipelle curette for endometrial pathologies.

Material and Methods: The study was a prospective interventional study conducted at the Department of Obstetrics and Gynecology, Kamla Raja Hospital, Gwalior. The sample size included 100 women above 30 years or women presenting with postmenopausal bleeding. Pipelle biopsy was performed, and the samples were sent for histopathology. Statistical analysis was done using SPSS software.

Results: The study compared the findings of pipelle biopsy with hysterectomy/D&C and found that the frequency of secretory endometrium was similar in both procedures. However, approximately 15% of pipelle biopsy samples were inadequate. False positive findings with pipelle biopsy included squamous metaplasia, squamous cell carcinoma (SCC), and non-keratinizing squamous cell carcinoma (NKSCC). False negative findings included adenocarcinoma, senile endometrium, and endometritis.

Conclusion: The study highlights the limitations and potential pitfalls of pipelle biopsy compared to hysterectomy/D&C. While pipelle biopsy can provide valuable information for certain conditions, it may miss or misdiagnose others. Clinicians should be aware of the potential for false negative and false positive results when interpreting pipelle biopsy findings and may need to use additional diagnostic tools or procedures for a more comprehensive evaluation of uterine pathology.

Introduction

Endometrial pathologies refer to various abnormalities and diseases affecting the lining of the uterus, known as the endometrium. Gynaecologists routinely sample the endometrium before a hysterectomy to detect unsuspected or asymptomatic endometrial pathologies as part of the preoperative workup regardless of the indication for hysterectomy [1]. Several endometrial sampling techniques are used to diagnose endometrial abnormalities for patients with or without abnormal uterine bleeding, including dilatation and curettage (D&C), aspiration techniques (Pipelle biopsy), and hysteroscopy [2]. Pipelle biopsy is a minimally invasive outpatient procedure that involves the sampling of endometrial tissue using a thin suction catheter. It is typically performed in cases of abnormal uterine bleeding, postmenopausal bleeding, or to investigate the possibility of endometrial hyperplasia or cancer. The collected tissue sample is then sent to the pathology laboratory for microscopic evaluation, where it undergoes histopathological analysis. Pipelle biopsy offers the advantage of being relatively simple, cost-effective, and associated with minimal discomfort for the patient. [3] On the other hand,

hysterectomy and D&C are more invasive procedures that involve the surgical removal of the uterus or scraping of the uterine lining, respectively. These procedures are typically performed for various reasons, including the management of uterine fibroids, endometriosis, adenomyosis, or as part of the management of endometrial cancer. The excised or scraped tissue is sent for histopathological examination, allowing for a detailed assessment of the endometrial tissue architecture, cellular composition, and presence of any abnormalities. [4] Comparing the findings of pipelle biopsy reports with hysterectomy or D&C histopathology can provide valuable information for clinicians in the management of endometrial pathologies. While pipelle biopsy allows for an initial evaluation and diagnosis, histopathology of a surgically excised or scraped specimen provides a more comprehensive assessment of the entire endometrium. The comparison helps identify any discrepancies or changes in diagnosis that may impact treatment decisions, such as the need for further surgical intervention or adjustments in the treatment plan. This comparative analysis provides clinicians with a comprehensive understanding of the disease process, enabling them to make informed decisions regarding treatment options and patient care. While pipelle biopsy offers a less invasive initial assessment, histopathological examination of surgically excised or scraped specimens provides a more detailed evaluation, aiding in accurate diagnosis and appropriate management of endometrial pathologies.

Objective

- To compare pipelle biopsy report with hysterectomy/ D&C histopathology report.
- To see the sensitivity and specificity of pipelle curette for endometrial pathologies.

Material and Methods

Study Place: Department of Obstetrics and Gynaecology, Kamla Raja Hospital, Gwalior (M.P.)
Study Type: Prospective interventional study
Sample Size: 100
Duration of Study: 2 years (Oct. 2019 to Sep. 2021)

Inclusion Criteria:

- Women > 30 years of age
- Women presenting with postmenopausal bleeding

Exclusion Criteria:

- Women < 30 years of age
- Women not willing to undergo the procedure.
- Patients with active pelvic inflammatory diseases

Procedure:

- The procedure takes 1-2 minutes.
- Patient is positioned in the dorsal position with the posterior vaginal wall retracted using a Sims speculum.
- Local spray of xylocaine 10% is applied to the cervix.
- The anterior lip of the cervix is held with a tenaculum at the 12 o'clock position and traction is applied.
- The pipelle suction curette is introduced into the uterine cavity until the tip reaches the uterine fundus and a resistance is felt.
- Negative pressure is generated by pulling out the piston, and the uterine cavity is swept several times from all walls using back-and-forth movements and rotations.
- The collected sample is sent for histopathology reporting to the Department of Pathology using formaldehyde.

Statistical Analysis:

- Data was compiled in an Excel sheet and analyzed using SPSS software version 2.0.
- Frequency and percentage were used to describe categorical data, while mean and standard deviation were calculated for continuous data.
- Descriptive statistics of clinical features, ultrasound findings, and endometrial histopathology obtained by pipelle biopsy and hysterectomy/D&C will be presented in terms of frequency and percentage.

Pipelle Suction Curette:

- Diameter: 3 mm
- Size: 24 cm
- Brand: Lumen Surgicals
- Single-use medical device
- Sterilization: Ethylene oxide (ETO)
- The endometrial tissues (histology specimen) are collected by the plunger's aspiration.
- Description: A flexible transparent polypropylene sheath with an outer diameter of 3.1 mm, inner diameter of 2.6 mm, and useful length of 23.5 cm. It has a lateral opening of 2.1 mm diameter and centimeter graduations in the distal part.
- An internal white polyoxymethylene (POM) piston.
- Active substances: Latex-free, animal/biological origin-free

Contraindication: Pregnancy

Results

Table 1: Distribution of study participants according to Hysterectomy/ D&C Finding

Hysterectomy/ D&C Finding	N	%
CNSI	21	21%
Secretory endometrium	20	20%
SEH without Atypia	12	12%
Proliferative Endometrium	10	10%
Endometritis	9	9%
Deficient secretory phase	6	6%
Senile Endometrium	6	6%
SCC	6	6%
SEH with atypia	2	2%
Mod. Diff. SCC	2	2%
Sq. Metaplasia	1	1%
NKSCC	1	1%
Proliferative & Adenomyosis	1	1%
Endometroid Carcinoma	1	1%
Endometrioid type 2 Adenocarcinoma	1	1%
Polyp	1	1%
Proliferative Endo cervicitis	1	1%
Grand Total	**100**	**100%**

Table 2: Comparison of HPE findings of Pipelle biopsy and Hysterectomy/D&C

Findings	Pipelle Report	Frequency (%)	Hysterectomy/ D&C	Frequency (%)
Secretory Endo.	22	22%	20	20%
Proliferative Endo.	21	21%	12	12%
Scanty Tissue	15	15%	00	00%
SEH without Atypia	12	12%	12	12%
SCC	7	7%	06	06%
Squamous Metaplasia	6	6%	01	01%
Endometritis	6	6%	10	10%
Deficient secretory phase	5	5%	06	06%
Cystic Glandular Hyperplasia	4	4%	00	00%
CNSI	4	4%	21	21%
NKSCC	3	3%	01	01%
SEH with atypia	1	1%	02	02%
Adenocarcinoma	1	1%	02	02%
Senile endometrium	1	1%	06	06%
Polyp	00	00	01	01%
Grand Total	**100**	**100%**	**100**	**100%**

In our study, comparing pipelle biopsy with hysterectomy/D&C, the frequency of secretory endometrium was similar in both procedures (22% vs 20%). Approximately 15% of pipelle biopsy samples were inadequate. False positive findings with pipelle biopsy included squamous metaplasia (5 patients), SCC (1 patient), and NKSCC (2 patients). False negative findings with pipelle biopsy included adenocarcinoma (1patient), senile endometrium (5 patients), and endometritis (4 patients).

Table 3: Differences in the findings of Pipelle andHysterectomy/D&C sample

Pipelle Finding	No. of Samples	Hysterectomy/ D&C Finding	No. of Samples	Sensitivity (%)
Cystic GlandularHyperplasia	04	• CNSI • Endometrioid carcinoma • Senile endometrium • SEH without Atypia	00	00
SquamousMetaplasia	06	• SEH without Atypia • SEH without Atypia • Senile endometrium • SEH without Atypia • Squamous metaplasia	01	16.6%

		• SCC		
SCC	07	• Moderately diff. SCC • SCC • SCC • Senile endometrium • Moderately diff. SCC • Squamous Metaplasia • SCC	06	85.7%
SEH with atypia	01	• Endometrioid type 2 adenocarcinoma	02	100%
NKSCC	03	• NKSCC • SEH with atypia • SCC	01	33.3%
Adenocarcinoma	01	• Endometroid type 2 adenocarcinoma	02	100%

Table 4: Sensitivity, Specificity Positive predictive value, and negative predictive value of Pipelle biopsy for diagnosis of Proliferative endometrium

Proliferativeendometrium		**Hysterectomy/D&C Biopsy Report**		**Total**	**PPV andNPV**
		Yes	**No**		
Pipelle Biopsy report	Yes	6	15	21	PPV- 28.6%
	No	4	75	79	NPV- 94.9%
Total		10	90	100	
Sensitivity and Specificity		Sen. - 60%	Spe. – 83.3%		Accu. - 81%

The sensitivity of pipelle biopsy in detecting proliferative endometrium was found to be 60% and specificity 83.3%, with a positive predictive value of 28.6% and negative predictive value of 94.9%, and an accuracy of detecting the same was 81%.

Discussion

A prospective interventional study was conducted at a tertiary care hospital, involving patients over 30 years of age who presented with abnormal uterine bleeding (AUB-E). The study included 100 participants and aimed to analyse the causes of AUB-E using pipelle's suction curette and compare the findings with the gold standard method of hysterectomy/fractional curettage.

In our study, when we compare the findings of pipelle biopsy and hysterectomy/D&C, the frequency of secretory endometrium in both the procedures was found almost equivalent (22% vs 20%). 15% of samples in pipelle biopsy were inadequate. When we consider false positive findings with pipelle biopsy, they were squamous metaplasia (5 patients), SCC (1 patient), NKSCC (2 patients). When we consider false negative findings with pipelle biopsy, they were adenocarcinoma (1 patient), Senile endometrium (5 patient), endometritis (4 patients).

In the study by Hwang et al., [5] the histologic results by endometrial sampling showed 76 (30.4%) patients with simple hyperplasia without atypia, 42 (16.8%) with complex hyperplasia without atypia, 4 (1.6%) with simple atypical hyperplasia, and 128 (51.2%) with complex atypical hyperplasia. Final pathological results from hysterectomy confirmed 35 (14.0%) patients with normal endometrium, 68 (27.2%) with simple hyperplasia without atypia, 24 (9.6%) with complex hyperplasia without atypia, 3 (1.2%) with simple atypical hyperplasia, 64 (25.6%) with complex atypical hyperplasia, and 56 (22.4%) with carcinoma.

When the diagnostic concordance between D&C and hysterectomy was assessed, in a total of 100 patients, 51 (51.0%) had diagnostic concordance: 23 (23.0%) with simple hyperplasia without atypia, 9 (9.0%) with complex hyperplasia without atypia, and 19 (19.0%) with complex atypical hyperplasia. In addition, when the diagnostic concordance between aspiration biopsy and hysterectomy was assessed, in a total of 100 patients, 62 (41.3%) had diagnostic concordance: 24 (16.0%) with simple hyperplasia without atypia, 6 (4.0%) with complex hyperplasia without atypia, 1 (0.7%) with simple atypical hyperplasia, and 31 (20.6%) with complex atypical hyperplasia.

In the study by Ilavarasi, et al., in the 16.35% (n = 17) who presented with PMB, the most common endometrial lesion was adenocarcinoma (n = 6, 35.3%), followed by complex endometrial hyperplasia with atypia (n = 2, 11.8%). The percentage of scanty tissue obtained was high (n = 6, 35.3%) in this population due to continuous bleed per vagina (P/V), focal endometrial lesion, and atrophic endometrial tissue. This depicts the statistical analysis of endometrial pathologies in

which pipelle biopsy had an accuracy of 88.5% in detecting simple hyperplasia, 99.04% in complex hyperplasia, 98.07% in complex hyperplasia with atypia, 98% in adenocarcinoma, 99.04% in stromal sarcoma, and 95.2% in detecting atrophic endometrium. The pipelle biopsy detected proliferative endometrium with sensitivity 60%, specificity 83.3%, PPV 28.6%, NPV 94.9%, and an accuracy of 81%. In the study by Sanam M. et al, the diagnosis of proliferative endometrium was 36.9% and 39.2% by pipelle and D & C methods. In this study the sensitivity, specificity, and accuracy rates were 94.4%, 100%, and 97.7% for diagnosis of proliferative endometrium which is lower than those reported by some studies (Abdelazim et al., 2013) [8].

Conclusion

In conclusion, our study compared the findings of Pipelle biopsy with Hysterectomy/D&C and identified several key observations. The frequency of secretory endometrium was similar in both procedures, while approximately 15% of Pipelle biopsy samples were inadequate. False positive findings with Pipelle biopsy included squamous metaplasia, squamous cell carcinoma (SCC), and non-keratinizing squamous cell carcinoma (NKSCC). False negative findings with Pipelle biopsy included adenocarcinoma, senile endometrium, and endometritis. The sensitivity of Pipelle biopsy in detecting proliferative endometrium was 60%, with a specificity of 83.3%. The positive predictive value for diagnosing proliferative endometrium with Pipelle biopsy was 28.6%, while the negative predictive value was 94.9%. The overall accuracy of Pipelle biopsy in detecting proliferative endometrium was 81%.These findings highlight the limitations and potential pitfalls of Pipelle biopsy as compared to Hysterectomy/D&C. While Pipelle biopsy can provide valuable information in diagnosing certain conditions, such as secretory endometrium, it may miss or misdiagnose other conditions, including adenocarcinoma and endometritis. Therefore, clinicians should consider the potential for false negative and false positive results when interpreting Pipelle biopsy findings and may need to utilize additional diagnostic tools or procedures for a more comprehensive evaluation of uterine pathology.

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