

Diagnostic Value of Outpatient Endometrial Aspiration and Transvaginal Sonography vs Inpatient Hysteroscopy in Evaluation of Abnormal Uterine Bleeding

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ABSTRACT

Objective: The objective of this study was to compare the efficacy of outpatient and inpatient procedures, and to assess whether hysteroscopy offers any additional benefit when compared to a combination of endometrial biopsy and vaginal ultrasound.

Materials and methods: A total of 50 patients aged >18 years who presented with abnormal uterine bleeding were included in this study. Endometrial aspiration with Pipelle cannula and transvaginal sonography on an outpatient basis and hysteroscopy under anesthesia were performed. The findings of endometrial aspiration and transvaginal sonography were correlated with hysteroscopy-guided biopsy.

Results: There is good sensitivity and negative predictive value of combined EA and TVS (i.e., 84.62% and 88.89%, respectively), while low specificity and positive predictive value (i.e., 51.61% and 42.31%, respectively), which is comparable to hysteroscopy, which has diagnostic accuracy values of sensitivity (84.62%), negative predictive value (90%), positive predictive value (45.83%), and specificity (58.06%).

Conclusion: The combination of TVS and pipelle sampling enhances the diagnostic yield, and hence can be used as first-line investigation as they complement each other, and can be used to triage the patients for hysteroscopy, which is the gold standard and has the added advantage of combining see and treat in skilled hands many cases.

Keywords: Abnormal uterine bleeding, Endometrial aspiration, Hysteroscopy, Transvaginal sonography.

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INTRODUCTION

Abnormal uterine bleeding (AUB) accounts for significant proportion of gynecological referral as it affects one in every five women during their life span. Only 30% of reproductive age group patients at the gynecology outpatient department were present with AUB; however, this proportion rises to 50% in perimenopausal age group.¹ The etiologies of AUB are diverse, varying from benign conditions such as leiomyoma, endometrial polyps, endometrial hyperplasia, and adenomyosis, or due to the presence of malignancy of genital tract.

Abnormal perimenopausal or postmenopausal bleeding is associated with endometrial carcinoma in approximately 10% of cases.² However, in a premenopausal woman, it is not a symptom of immediate concern with respect to cancer. Benign focal lesions, such as endometrial polyps and fibroids, are commonly responsible for AUB in 18–40% women.³ It has been calculated that 3,000–4,000 women under 40 years with abnormal bleeding would have to be evaluated to detect one case of endometrial cancer.⁴

The question of what is the best diagnostic strategy in patients with abnormal uterine bleeding still remains controversial.

The pipelle endometrial aspiration (EA) device is a safe, efficient, and cost-effective means of evaluating the uterine endometrium. The procedure is easily accomplished in the outpatient setting. There is evidence that endometrial sampling alone may miss lesions between 10% and 33% of cases.⁵

Transvaginal ultrasound (TVS) is a method routinely used for differentiating between the causes of uterine bleeding such as adenomyosis, endometrial polyps, and leiomyoma. A major limitation of TVS is the high false-negative rate in diagnosing focal intrauterine pathology.⁶

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Hysteroscopy has been generally accepted as the gold standard for the evaluation of the uterine cavity because the entire endometrial cavity is directly visualized to identify the pathological changes, which may be the cause of bleeding and perform the biopsy of the suspected lesion under direct visual inspection.⁷ The major problem with a regular hysteroscopy is the need for general anesthesia, non availability, and higher cost of procedure.

The objective of this study was to compare the efficacy of outpatient and inpatient procedures, and to assess whether hysteroscopy offers any additional benefit when compared to a combination of endometrial biopsy and vaginal ultrasound.

MATERIALS AND METHODS

The study was carried out at the Department of Obstetrics and Gynecology at Kasturba Hospital, Delhi, India, after obtaining Ethical Clearance from Institutional Ethical Committee. 50 patients of age >18 years were included, who presented with the history of

abnormal uterine bleeding, excluding any demonstrable pelvic pathology such as cancer of cervix, vagina, or endometrium on clinical examination and active pelvic infection. Detailed history, examination, and investigations were done after informed consent.

Endometrial aspiration with pipelle cannula and transvaginal sonography were performed in premenstrual phase on outpatient basis. Hysteroscopic examination was done in all patients under anesthesia. Biopsy was taken from the suspected area and subjected to a histopathological examination. The findings of endometrial aspiration and transvaginal sonography were correlated with hysteroscopy and guided biopsy.

Data were recorded on a predesigned proforma. Statistical analysis was done of data obtained in terms of sensitivity, specificity, positive predictive value and negative predictive value.

RESULTS

The mean age of the patients was 42.48 ± 10.17. 48% belonged to reproductive age group, 34% belonged to perimenopausal age group, and 18% belonged to post menopausal age. The most common symptom in reproductive and perimenopausal age group was menorrhagia (58%) followed by polymenorrhagia (12%). While postmenopausal bleeding was seen in 18%.

Majority of the patients on transvaginal sonography (66%) had normal endometrial thickness (E.T.) between 4.1 and 8 mm. 10% had E.T. >12 mm suggestive of hyperplastic endometrium. 6% had atrophic endometrium of thickness less than 4 mm.

Fibroid (18%) and polyps (18%) were the most common focal pathologies. Of the 18% polyps, 12% were intracavitary and 6% were cervical polyps on TVS. Irregular endometrial growth was suspected in 3 cases (6%). 1 case that showed irregular growth suggestive of endometrial carcinoma, also had E.T. of 18 mm (Table 1).

Endometrial aspiration biopsy was found to be adequate in 94%. Only 3 cases (6%) had inadequate sample. On histopathology, normal endometrium was found in 88% patients. Preinvasive lesions such as atypical and complex hyperplasia were seen in 2 cases (4%). One case was diagnosed to have polyp (2%) (Table 1).

On hysteroscopy, 25 (50%) patients had normal intrauterine cavity. Most common intrauterine pathology was polyp in 11 cases (22%), followed by fibroid seen in 8 cases (16%). Only 3 women had intrauterine growth (6%). One (2%) was true cervical polyp while two patients (4%) were found to have endometritis with adhesions and inflammation (Table 1).

A hysteroscopy-guided biopsy was taken in 48 out of 50 cases, but it could not be taken in 2 cases owing to cervical stenosis and operative hysteroscope could not be introduced.

In 8 cases out of the 11 polyps, polyp resection using monopolar resectoscope was done. In 1 case, polypectomy was done by twisting the pedicle after holding it by sponge holding forceps as it was lying in cervical canal and it was a true cervical polyp.

One fibroid polyp had friable endometrium, and infection was suspected; so only biopsy performed; later on histopathology it was reported as endometrial carcinoma (Fig. 1). In 3 cases, polyp resection could not be done as one was grade III sessile polyp with <50% of polyp in the uterine cavity and one patient had two huge fibroid polyps of >5 cm in size each (Fig. 2). Hence in addition to diagnosis, complete treatment could be provided by performing polypectomy in 16% of cases by hysteroscopy.

On comparing the quality of samples for histopathology, it was observed that the adequacy of sampling with endometrial aspiration biopsy was 94%, while with hysteroscopy-guided biopsy was 92% as 2 patients had cervical stenosis and thus biopsy could not be taken in them and in 2 the sample had poor yield. This was comparable with *p* value 1.000.

With regard to complications, endometrial sampling and TVS had no complications. While on hysteroscopy, majority (98%) of the patients had no complications. Only 1 patient had fluid overload during diagnostic hysteroscopy, which was managed by stringent monitoring and the patient improved within 24 hours.

The findings of endometrial aspiration biopsy and transvaginal sonography were compared with histopathology of hysteroscopy guided biopsy as gold standard (Table 2).

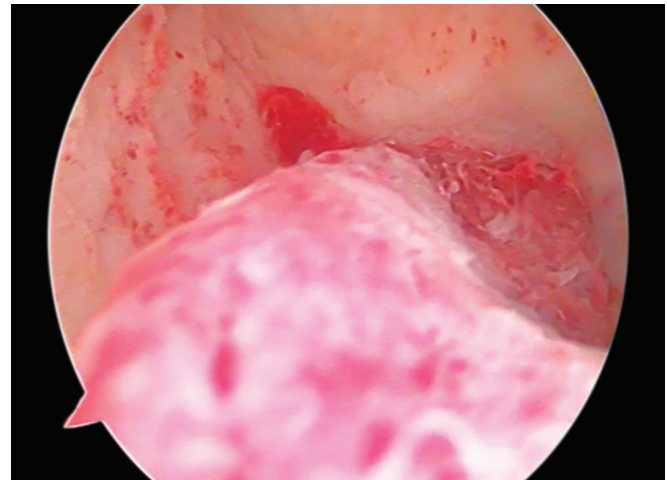


Fig. 1: Growth arising from fundus

Table 1: Observations by different diagnostic modalities

Diagnosis/parameter	Hysteroscopy	Endometrial aspiration	TVS	Hysteroscopic biopsy
Normal	25 (50%)	44 (88%)	29 (58%)	31 (62%)
Polyp	11 (22%), 1 Cx polyp	1 (2%)	9 (18%)	8 (16%)
Fibroid	8 (16%)	—	9 (18%)	—
Hyperplasia	—	2 (4%)	—	2 (4%)
Ca endometrium	3 (6%)	0	3 (6%)	1 (2%)
Endometritis	2 (4%)	—	—	2 (4%)
Adequacy of sample for histopathology	—	47 (94%)	—	46 (92%)
Complications	1 (2%) fluid overload	Nil	Nil	—

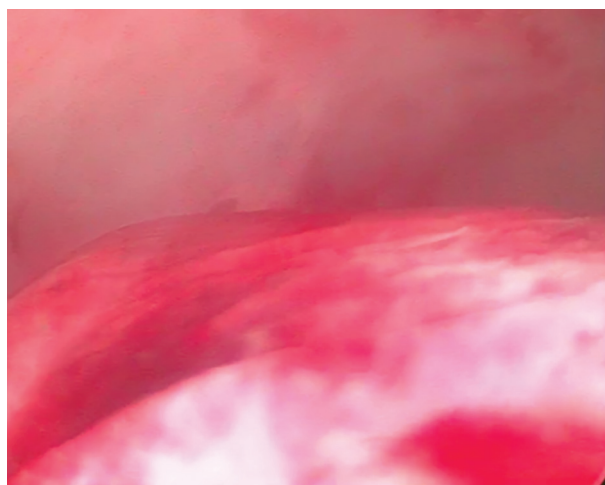


Fig. 2: Huge fibroid polyp

Table 2: Diagnostic accuracy of TVS and endometrial aspiration (EA) vs histopathology of hysteroscopic biopsy

EA + TVS	Total	Histopathology on hysteroscopy biopsy	
		Abnormal	Normal
Abnormal	26 (59.09%)	11 (84.62%)	15 (48.39%)
Normal	18 (40.91%)	2 (15.38%)	16 (51.61%)
Total	44 (100.00%)	13 (100.00%)	31 (100.00%)

Table 3: Diagnostic accuracy of various modalities

Diagnostic modalities	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
TVS	69.23	61.29	42.86	82.61
EA	25	100	100	76.32
Hysteroscopy	84.62	58.06	45.83	90.00
EA + TVS	84.62	51.61	42.31	88.89

There is good sensitivity and negative predictive value of endometrial aspiration biopsy with TVS, i.e., 84.62% and 88.89%, respectively while low specificity (51.61%) and low positive predictive value (42.31%).

On comparing the sensitivity, specificity, positive predictive value, and negative predictive value, of TVS, EA, TVS with EA and hysteroscopy with the gold standard of hysteroscopic biopsy as it can be seen from Table 3, the best value are achievable by hysteroscopy (84.62%, 58.61%, 45.83% and 90.0%, respectively). The diagnostic accuracy of endometrial aspiration combined with transvaginal sonography, together are also of similar range only (84.62%, 51.61%, 42.31%, and 88.89%, respectively).

DISCUSSION

The non-availability of a suitable test for a uterine cause of AUB could prevent months of delay in making the correct diagnosis and planning a treatment. Hence the need for a diagnostic modality which is safe, accurate, cost-effective, and easily available is essential. While most patients have benign cause of AUB; however,

it is essential to rule out more sinister causes such as carcinoma and its precursor hyperplasia in peri and postmenopausal age group.

Outpatient investigations are the pipelle endometrial sampling and transvaginal sonography. When used individually they have their pitfalls.

Endometrial sampling was found to have 100% specificity and 100% positive predictive value but low sensitivity (25%) when compared with hysteroscopy guided biopsy. The most commonly missed diagnosis were benign intracavitary polyp and fibroid as it is a blind procedure. But it is very helpful diagnostic modality to rule out the more ominous and sinister endometrial pathologies such as atypical hyperplasia and precursors of malignancy. This is a good modality for ruling in a pathology than ruling out.

Transvaginal ultrasonography is a simple, well-tolerated, noninvasive, office procedure. Even though transvaginal sonography has a good sensitivity (69.23%), it fails to differentiate between endometrial polyps, hyperplasia and endometrial carcinoma when compared to hysteroscopy guided biopsy. TVS has a high negative predictive value (82.61%), indicating that TVS is a better screening modality (Table 3).

On combining the two outpatient procedure, the diagnostic accuracy reaches close to hysteroscopy. This can safely be used as the initial modality and it may allow triaging the patients for hysteroscopy. Endometrial sampling picks up the endometrial pathologies missed by TVS and TVS is able to diagnose the focal uterine abnormalities missed by EA. Hence they are complementary to each other.

Hysteroscopic evaluation of the endometrial cavity combined with visually directed biopsy for histo-pathological evaluation was found to have the best diagnostic accuracy values of sensitivity (84.62%), negative predictive value (90%), positive predictive value (45.83%), and specificity (58.06%).

Hysteroscopy with guided biopsy is without doubt “the gold standard” investigative modality for the evaluation of the uterine cavity method. It is a dynamic test and allows a direct visualization with guided biopsy of the endometrium. It also has the advantage of being able to treat endometrial pathology at the same time as diagnosing endometrial polyps or submucous fibroid. We were able to perform hysteroscopic polypectomy in 16% of patients. It can be used as “See and Treat” modality in management of AUB.

However it is an invasive procedure, expensive, not available at all clinics and requires anesthesia and considerable operator skills. This disadvantage is overcome by availability of small-diameter hysteroscopes and small operative instruments. This has expanded the use of this procedure, enabling hysteroscopy to be performed under local anesthesia in an office setting.

Tahir et al.,⁸ concluded that with the combination of TVS and pipelle sampling, a few of endometrial polyps and a small number of fibroids would not be detected initially. It is unlikely that any serious pathology would be overlooked. If further unexplained bleeding presents itself or if TVS or pipelle sampling is not possible, then hysteroscopy could be used as a second-line investigation.

Our observations are concordant to reports by Hunter,⁹ taking hysteroscopy/biopsy as the gold standard, the overall sensitivity of transvaginal scanning combined with endometrial biopsy was 75% for endometrial pathology with a specificity of 90%, positive predictive value 40%, and negative predictive value 98%. Biopsy is more diagnostic for endometrial pathologies, but likely to miss polyps and fibroids whilst ultrasound is likely to identify intramural fibroids but be unable to differentiate between endometrial

hyperplasia, endometrial polyps, and early cancers. Thus they are complementary to each other.

CONCLUSION

Combination of TVS and pipelle sampling enhances the diagnostic yield with accuracies not significantly different from hysteroscopy. They can be used as first-line investigation as they complement each other, and can be used to triage the patients for hysteroscopy.

Hysteroscopy and guided biopsy has been reiterated as gold standard for assessing the endometrium and detecting or ruling out endometrial cancer along with the added advantage of treating the pathology in some cases. However, to get the maximum benefit from this procedure, it is important to select patients properly and the investigation should be performed by skilled personnel to obtain optimal results so that patients are managed adequately and cost effectively.

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