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The role of hysteroscopy in diagnosis of suspected endometrial pathology and its histopathological correlation

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Abstract
Background: Abnormal endometrium is an important entity of gynecological practice faced in many pathological conditions. The goal was to survey the accuracy of observational hysteroscopy in assessment of endometrial pathology and to corresponding hysteroscopy findings with histopathology results.
Objective: To establish the diagnostic value of hysteroscopy in assessment of endometrial pathology and to relate hysteroscopy judgments to histopathological judgments.
Patients and Methods: A cross sectional study conducted at Al-Elwiya Maternity Teaching Hospital in Baghdad from the 1st of January 2017 to 1st of June 2019, 100 cases were chosen within the age 25 -58 years, who were with history of abnormal uterine bleeding or abnormal endometrium or infertility. Hysteroscopic examination was done in all patients post menstrually. The endometrium was sent for histopathological examination. The correlation between hysteroscopic findings and histopathological examination was organized.
Result: AUB was more common in patients of age 32-49 yrs. The most widely recognized complaint was Menorrhagia. On hysteroscopy 82% of patients had some anomaly which incorporates: endometrial hyperplasia, polyps, sub mucous myoma, endometrial carcinoma, misplaced IUCD and synechiae. Both hysteroscopy and curettage were precise when a variation from the norm was analyzed, yet the capacity to determine a lesion was more with hysteroscopy in contrast with curettage. Hysteroscopy discovered more data than curettage.
Conclusion: Hysteroscopy is an eye in uterus and it gives more exact details than dilatation and curettage alone in patients with abnormal uterine bleeding and other endometrial problems.

Keywords: Hysteroscopy, endometrial pathology, histopathology

Introduction
Abnormal endometrium is an important entity of gynecological practice faced in many pathological conditions. Amongst all, abnormal uterine bleeding (AUB) is the most common symptom. AUB forms almost 10% of consultations in any busy outpatient clinic and effect females from menarche to menopause [1].
Until recent times, usual method of evaluating this symptom was dilatation and curettage. But this detects the cause in less than 50% of the cases [2].
Considering the efficacy and safety of hysteroscopy in diagnosing and treating many common obstetrical and gynecological conditions, introducing this method in our practice is an essential; a fact that has not been studied very well [3].

Abnormal endometrium
Abnormally thickened endometrium can be due
1. Endometrial hyperplasia: Usually uniformly hyper echoic and usually diffuse. Can be a differential diagnosis of many gynecological problems.
2. Endometrial polyp: tends to be hyper echoic, often focal, may be single or multiple. Tamoxifen related endometrial changes: variable appearances.
3. Hormone replacement therapy (HRT) in postmenopausal women.
4. Endometritis: clearly hyperechoic endometrium with or without fluid and debris.
5. Adhesions: irregular echogenic areas with focal thickening.
6. Obstructed outlet
7. Ovarian tumors associated with endometrial thickening, e.g. endometroid carcinoma of the

ovary, granulosa cell tumor of the ovary [1].
8. Foreign body e.g. missed intrauterine contraceptive device.

Diagnosis

The diagnostic value with abnormal uterine bleeding is to exclude cancer and to find the underlying pathology to permit optimal treatment. Technologic development have changed the evaluation of women with abnormal uterine bleeding:

A. Ultrasonography
B. Saline infusion Sonohysterography (SIS) 2D AND 3D.
C. Endometrial biopsy by Dilatation and curettage (D and C).
D. Hysteroscopy [4].

This procedure involves introducing an optic endoscope, usually 3-5 mm in diameter, into the endometrial cavity. The uterine cavity is then distended with saline or another medium for visualization. In addition to inspection, biopsy of the endometrium permits histologic diagnosis of visually abnormal area and has been shown to be safe and accurate means to identify pathology.

In fact, for many studies done to investigate the accuracy of TVS or SIS for evaluation of intra-cavitary uterine pathology, hysteroscopy is used as the gold standard for comparison.

The main benefit of hysteroscopy is to detect intra-cavitary lesions such as leiomyoma and polyps that might be missed using trans-vaginal sonography and endometrial sampling.

In fact, some have advocated hysteroscopy as the primary diagnostic procedure of abnormal uterine bleeding [4].

The aim of this study: To establish the diagnostic value of hysteroscopy in assessment of endometrial pathology and to relate hysteroscopy judgments to histopathological judgments.

Material and Methods

A cross sectional study conducted at AL-Elwiya Maternity Teaching Hospital in Baghdad from the 1st of January 2017 to 1st of June 2019. The study protocol was approved by the authority of Al-Elwiya Maternity Teaching Hospital.

The sample size that was included in the study was hundred women were referred with infertility, AUB, abnormal ultrasonography scanning, postmenopausal bleeding, missed foreign body (IUCD). The patients were admitted to our gynecology department at Al-Elwiya Teaching Hospital.

Patients underwent a preliminary assessment by history, clinical examination and USS of the pelvis. Baseline laboratory investigations included a complete blood count were also done. All hysteroscopy were performed under general anesthesia using diagnostic hysteroscopy with outer sheath 5 mm (Storz GmbH, Germany). All procedure was video recorded. The uterine cavity was expanded using distension media. (Normal saline). Hysteroscopy was performed with a standard sequence, inspecting vagina (Vaginoscope), ectocervix, endocervical canal, uterine cavity, endometrium and tubal ostia. Hysteroscopy findings were allocated either to "the uterine cavity lesions" or "the endometrial aspect characterization". The uterine cavity lesions that were found including: endometrial polyp, cervical polyp, myoma, endometrial adhesions, congenital malformation, lost intrauterine device (IUD). In the endometrial aspect characterization, differentiation between functional, atrophic or thin endometrium, dysfunctional, endometritis, cystic atrophy, hyperplasia, polypoidal, and carcinoma was done. Hysteroscopy examination was done in all patients post-menstrualy, whenever possible, except in those cases where menstrual cycles were grossly irregular or patients came with continuous bleeding per vaginum (PV).

The hysteroscopy observations were documented, and an endometrial biopsy and/or the removal of the pathology were performed. The histopathological results were used as gold standard and compared with the hysteroscopy documented observation. The sensitivity, specificity, and predictive value of hysteroscopy were calculated.

Further management of the patient was decided according to age, parity, severity of the disease, hysteroscopy and histopathological report.

Results

In this study one hundred (100) patients were recruited: the age ranges from (25-58), average 42 years.20infertility (20%), 8 abnormal US findings (8%), 4 postmenopausal bleeding (4%), 8 missed foreign body (IUCD) (8%), 60 AUB (60%).

Among 20 cases presented with infertility 12 cases seen with normal endometrium while histopathology reveals hormonal imbalance and defective proliferative phase, 4 cases with endometrial polyp confirmed by histopathology, 4 cases with endometrial hyperplasia also confirmed by histopathology.

8 cases presented with accidental findings of thick endometrium (>5 mm) by US with no complaint in postmenopausal women hysteroscopy reveals endometrial and endo-cervical polyp in 4 cases confirmed by histopathology and hyperplasia in 4 cases con- firmed by histopathology (Hyperplasia with atypia treated eventually by total abdominal hysterectomy and bilateral salpingo-oophorectomy TAH+BSO).

4 cases presented with bleeding postmenopausal, TVS reveals ET>10 in all cases hysteroscopy reveals endometrial hyperplasia in all 4 cases, 2 of them hyperplasia associated with adhesions, one case was nulliparous (Infertility) accidental finding of endometrial septum. Histopathology reveals endometrial hyperplasia with atypia all cases treated with TAH+ BSO.

8cases presented with abnormal uterine bleeding with history of retained IUCD (Missed thread), age below 35 years old, by hysteroscopy localization and removal of IUCD done under vision.

Among 60 cases presented with AUB, 20 cases presented with irregular and inter- menstrual bleeding, 16 of them were below 40 years of age, 4 cases were 40-44 years old. 12 cases hysteroscopy show normal endometrium while histopathology reveals hormonal imbalance with disordered proliferative or luteal phase of menstrual cycle, 4 cases Endocervical polyp seen by hysteroscopy confirmed by histopathology, 4 cases focal endometrial hyperplasia seen by hysteroscopy with biopsy under vision, hysteroscopy reveals hyperplasia with atypia, 2 of these 4 cases were with strong family his- tory of CA endometrium.

4 cases (45-49 years old) presented with menorrhagia, ET >12, those patients were with history of CA breast, on tamoxifen treatment, hysteroscopy show endometrial hyperplasia, endometrial adhesions and irregularity. Histopathology reveals simple endometrial hyperplasia without atypia.

36 cases presented with menorrhagia, abnormal uterine bleeding and anemia need blood transfusion in about 50% of cases, (42-50 years old), ET>20mm by TVS, hysteroscopy show endometrial polyps, endometrial hyperplasia in 20 cases, with intrauterine adhesions in some of these cases, and suspicious areas of malignancy in others, histopathology confirm polyps and simple hyperplasia, in those with suspicious areas histopathology reveals hyperplasia with atypia treated by TAH+BSO.

4 cases presented with menorrhagia, irregular uterine bleeding, anemia need blood transfusion, (45-47 years old) ET >25mm, by

hysteroscopy severe endometrial hyperplasia with suspicion of malignancy, histopathology reveals complex hyperplasia with atypia treated with TAH+B.

12 cases presented with heavy and irregular vaginal bleeding, age (45-47 years old) ET>12mm, hysteroscopy show endometrial hyperplasia, histopathology confirmed hy- perplasia with atypia.

Table 1: Distribution of studied patients according to hysteroscopy findings:

Findings	N=100	Percentage
Endometrial Hyperpalsia	48	48
Endometrial/endocervical polyp	20	20
Poliferative	12	12
Mis-placed CuT	8	8
Secretory	6	6
Submucous Myoma	4	4
Endometrial Cancer	2	2

Table 2: Distribution of studied patients according to histopathology findings

Findings	N=100	Percentage
Simple Hyperplasia with atypia	28	28
Endometrial/endocervical polyp	28	28
Proleferative	10	10
Simple Hyperpalsia without atypia	10	10
Secretory	8	8
Mis-Placed CuT	8	8
Complex hyperplasia with atypia	6	6
Submucous Myoma	2	2
Complex hyperplasia without atypia	0	0
Endometrial Cancer	0	0

Table 3: Correlation between hysteroscopy and histopathology findings in studied patients:

Hysteroscopy Findings				Histopathology Findings					
Proliferative	Secretory	Simple- hyper-plaia	Simple hyper-plasia with	Complex Hyper-plasia	Complex Hyper-	Polyp	Fibroids	Malignancy	Total
10	2	0	0	0	0	0	0	0	
0	6	0	0	0	0	0	0	0	
0	0	8	28	0	4	8	0	0	
0	0	0	0	0	2	0	0	0	
0	0	2	0	0	0	0	0	0	
0	0	0	0	0	0	20	2	0	
8	8	0	0	0	0	0	0	0	
18	8	10	28	0	6	28	2	0	

Table 4: Validity of hysteroscopy in detecting proliferative changes

Validity test			Histopathology		
			Proliferative N	Other	Total
			No. (%)	No. (%)	No. (%)
Hysteroscopy Findings	Proliferative N	No. (%)	10	2	12
	others	No. (%)	8	80	88
	Total	No. (%)	18	82	100
Sensitivity			56%		
Specificity			98%		
+ve predictive value			%83		
-ve predictive value			%92		
Accuracy			91%		

Table 5: Validity of hysteroscopy in detecting secertory changes.

Validity test			Histopathology		
			Secretory N	Other	Total
			No. (%)	No. (%)	No. (%)
Hysteroscopy Findings	Secretory N	No. (%)	6	0	6
	others	No. (%)	2	92	94

	Total	No. (%)			100
Sensitivity		75%			
Specificity		100%			
+ve predictive value		100%			
-ve predictive value		98%			
Accuracy		98%			

Table 6: Validity of hysteroscopy in detecting hyperplasia

Validity test			**Histopathology**		
			Hyperplasia	**Other**	**Total**
			No. (%)	**No. (%)**	**No. (%)**
Hysteroscopy Findings	Hyperplasia	No. (%)	40	8	48
	others	No. (%)	4	48	52
	Total	No. (%)	44	56	100
Sensitivity		91%			
Specificity		86%			
+ve predictive value		83%			
-ve predictive value		92%			
Accuracy		88%			

Table 7: Validity of hysteroscopy in the diagnosis of endometrial cancer

Validity test			**Histopathology**		
			Endometrial Cancer	**Other**	**Total**
			No. (%)	**No. (%)**	**No. (%)**
Hysteroscopy Findings	Endometrial Cancer	No. (%)	0	2	2
	others	No. (%)	0	98	98
	Total	No. (%)	0	100	100
Sensitivity		0%			
Specificity		98%			
+ve predictive value		0%			
-ve predictive value		100%			
Accuracy		98%			

Table 8: Validity of hysteroscopy in detecting fibroid.

Validity test			**Histopathology**		
			Fibroids	**Other**	**Total**
			No. (%)	**No. (%)**	**No. (%)**
Hysteroscopy Findings	Fibroids	No. (%)	2	2	4
	others	No. (%)	0	96	96
	Total	No. (%)	2	98	100
Sensitivity		100%			
Specificity		98%			
+ve predictive value		50%			
-ve predictive value		100%			
Accuracy		98%			

Table 9: Validity of hysteroscopy in detecting hyperplasia

Validity test			**Histopathology**		
			Polyp	**Other**	**Total**
			No. (%)	**No. (%)**	**No. (%)**
Hysteroscopy Findings	Polyp	No. (%)	20	0	20
	others	No. (%)	8	72	80
	Total	No. (%)	28	72	100
Sensitivity		71%			
Specificity		100%			
+ve predictive value		100%			
-ve predictive value		90%			
Accuracy		92%			

Table 10: Validity of hysteroscopy in detecting endometrial disorders.

Targeted Endometrial Disorder	**Histopathology**	**Validity**	
	SN % (CI)	SP % (CI)	ACC % (CI)
Proliferative	65(31-78)	98(91-100)	90(82-95)
Secretory	75(36-96)	100(95-100)	98(92-100)
Endometrial Hyperplasia	91(77-97)	86(73-93)	88(80-93)

	Endometrial Cancer	----------	98(92-100)	98(92-100)
	Fabroid	100(20-95)	98(92-100)	98(92-100)
Total	Polyp	71(51-86)	100(94-100)	92(84-96)

Statistical analysis

EpiCalc 2000 version 1.02 was used to estimate indicators of diagnostic validity of hysteroscopy (Against histopathology). Indicators (Sensitivity, specificity, and accu- racy/concordance) presented with their 95% confidence intervals.

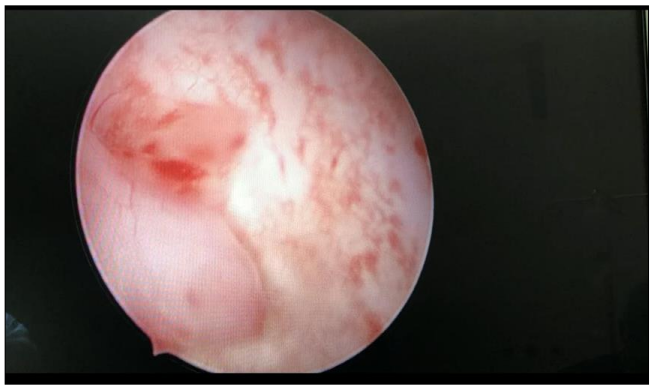

Fig 1: Hysteroscopy showing Endometrial Hyperplasia with Endometrial Polyp

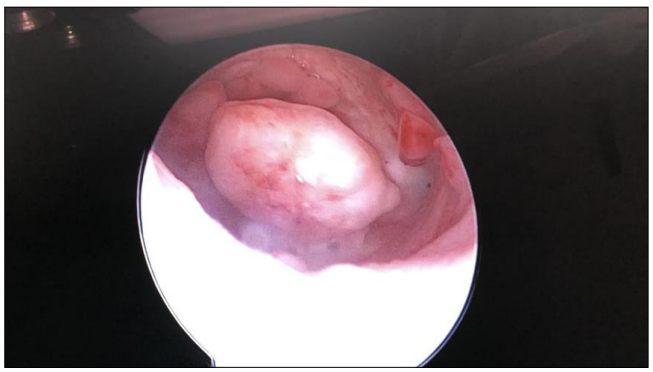

Fig 2: Panoramic view of endometrial cavity showing pedunculated fibroid

Discussion

Abnormal uterine bleeding affects one third of women of reproductive age and up to 50% of premenopausal women [5]. The complaint of AUB causes significant morbidity and negative impact on the quality of life [6], in both developed and developing countries. For years' dilatation and curettage (D and C) was used for endometrial biopsy. However, because of associated surgical risks and limitations of diagnosis of endometrial pathology [5], yet in around 10% patients assessed by curettage; may miss the central pathology. Hysteroscopy offers a significant support of the gynecologist weapons [7].

An outpatient hysteroscopy service offers a safe, convenient and cost-effective means of diagnosing and treating abnormal uterine bleeding as well as aiding the management of other benign gynecological conditions (e.g. Fertility control, subfertility and miscarriage and abnormal glandular cervical cytology) [8].

In the present study, one hundred (100) patients were included: the age ranges from (25-58), average 42 years. the most common indication of hysteroscopy was AUB in reproductive age women present in 60 cases (60%) and least common indication was postmen-opausal bleeding presents in 4 cases (4%) this finding is consistent with the finding by Chaudhari K *et al*. 2014 [9] Patients were subjected to two modalities of investigation to reach a conclusion- diagnostic hysteroscopy and endometrial histopathological report. This study was undertaken to document the Hysteroscopic findings and their histopathological report in patients with AUB and suspected endometrial pathology in the institution over a period of 2 years. The results are shown in tables.

In our study sensitivity, specificity, positive predictive value, negative predictive value and accuracy for hysteroscopy were 98.3%, 80.5%, 89.7%, 96.7% and 91.8% respectively. The use of hysteroscopy in AUB and suspected endometrial pathology is a substitute for the blind curettage, as it observes and decides the cause. This is because the uterine cavity can be seen panoramically and the area in suspicion can be curetted for HPE. In fact, it is an eye in uterus [10]. Also as suggested by a recent economic evaluation 10 that initial check up by hysteroscopy may be more cost effective if contemporary one session testing and treatment modalities are available during single visit [11]. The most common finding was endometrial hyperplasia. Normal endometrium was seen in 18% of the patients. In our series of patients, endometrial hyperplasia was seen in 48 patients (48%). The abnormal findings on hysteroscopy were shown in 82 patients (82%) patients. Of the 82 patients with abnormal findings on hysteroscopy commonest was endometrial hyperplasia (48%) followed by endometrial and cervical polyp in 20% and misplaced IUCD 8% intramural myoma 4% HPE confirmed the findings- the accuracy near about 100. with endometrial hyperplasia with atypia in about 28% of Abnormal peri and postmenopausal bleeding.

Conclusion

It is concluded that hysteroscopy offers an invaluable advantage of direct visualization of any abnormality within the uterine cavity. Hysteroscopy is safe, reliable, cost effective and fast method in determination of cases with abnormal uterine bleeding and other suspected pathology within the uterine cavity. However endometrial biopsy improves the diagnostic accuracy of hysteroscopy. Hysteroscopic-guided biopsy and histopathology are considered as the “new gold standard” in evaluating a case of abnormal uterine bleeding.

Conflicts of interest: No

Source of funding: Self

Ethical clearance: Was taken from the scientific committee of the Iraqi Ministry of health

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