ORIGINAL ARTICLE

Diagnostic Hysteroscopic Procedure Evaluation in Outpatient Clinic for Women with Perimenopausal Bleeding

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ABSTRACT

Background: Abnormal uterine bleeding means any variation from the normal menstrual cycle either increase in volume, duration or amount of bleeding or variation with respect to regularity, or bleeding in between the normal menstrual cycle for a period of 6 months. Diagnostic modalities for evaluating the cause of abnormal uterine bleeding are many. These include ultrasonography, dilatation and curettage (D & C), and hysteroscopy and hysteroscopic-guided endometrial biopsy. The current study aimed to compare the efficacy of hysteroscopy and transvaginal ultrasonography (TVUS) in diagnosing endometrial pathologies in patients with perimenopausal abnormal uterine bleeding (AUB). **Methods**: The study included 120 patients with abnormal uterine bleeding. Patients were subjected to full medical taking, gynecological examination, transvaginal ultrasound and office hysteroscopy. Endometrial sampling was performed using either D&C or hysteroscopy and tissue biopsies were analyzed by histopathological examination. **Results:** Ultrasonography can diagnose endometrial hyperplasia with 42.2% sensitivity with 84% specificity and overall accuracy 68.3%. Hysteroscopy can diagnose endometrial polyp with 60.9% sensitivity 93.2% specificity and overall accuracy 72.5%. Hysteroscopy can diagnose cervical polyp 77.8% sensitivity and 97.3% specificity and overall accuracy 95.8%. Ultrasonography can diagnose fibroid with 75% sensitivity and 86.9% specificity and overall accuracy 73.3%. While hysteroscopy had 52.8% sensitivity and 87.5% specificity and overall accuracy 75.8% Ultrasonography can diagnose adenomyosis with 71.4% sensitivity, 86% specificity and overall accuracy 85%. While hysteroscopy had 77.8% sensitivity with 91.9% specificity and overall accuracy 90.8%. **Conclusions:** Ultrasonography and hysteroscopy can diagnose endometrial pathologies in patients with perimenopausal abnormal uterine bleeding with comparable results.

Keywords: Abnormal uterine bleeding, Ultrasonography, Hysteroscopy.

INTRODUCTION:

Abnormal uterine bleeding (AUB) is a major clinical problem for postmenopausal, perimenopausal, and reproductive women ages [1]. AUB in women aged 40 and older, particularly in the peri and postmenopausal age groups, necessitates a thorough evaluation to rule out atypical endometrial hyperplasia and cancer [2]. Because of the wide range of differential

diagnoses, abnormal uterine bleeding can be difficult to diagnose. The reason of bleeding remained unknown after a comprehensive pelvic examination, many blood tests, and a detailed history is only established in 50 to 60% of cases[3]. Therefore, the need for efficient diagnostic tools and maximal sensitivity and sensitivity is a must [4].

Transvaginal ultrasound (TVUS) is one technique that has been applied to assess the uterine cavity and endometrium. Furthermore, it is possible to evaluate endometrial thickness, uterine volume, fibroids present or absent, endometrial homogeneity, and the existence of aberrant vascularity inside the endometrium by TVUS[5]. TVUS is therefore considered an effective screening test to assess abnormal uterine bleeding caused, however, it has a low specificity and a limited sensitivity in various situations as thickened endometrium [5].

Direct vision of the uterine cavity and cervical canal is possible with hysteroscopy, which allows for the detection of intrauterine abnormalities **Yen et al., [7]** proper diagnosis can save the need for extensive surgery by directing medical or surgical therapy toward the specific pathology [8]. Despite the absence of solid evidence on diagnostic accuracy, it is utilized as a reference standard in numerous researches with and without endometrial collection [9]. Office hysteroscopy showed beneficial role in assessing endometrial pathology as it decreases patients discomfort and lowers overall financial burden [10].

A accurate and less intrusive method of inspecting the uterus cavity is hysteroscopy [11]. It is a dynamic examination that provides direct visualization of the endometrium, displaying any anomalies in the uterine cavity's type, location, shape, size, and vascular pattern [12]. Hysteroscopy's main benefit is that biopsies may be done safely at the same time, which enhances the outcome[13].

The purpose of this study was to investigate the efficacy of hysteroscopy in assessing endometrial lesions in cases of perimenopausal bleeding.

METHODS:

This Prospective study included 120 cases presented with AUB. Patients aged between

40 and 55 years and presented with perimenopausal bleeding were included. While pregnant patients, individuals with vaginal tract acute inflammatory disorders, cervical malignancy, bleeding disorder, fibroid uterus or on hormonal therapy were excluded. Approving the study was our Local Ethics Committee (IRB # 10485/28-2-2023). Written informed consent was obtained from all participants. The study's protocol complied with the Helsinki Declaration, which is the World Medical Association's code of ethics for research on humans

Every patient had their complete medical history examined, including their past, current, and personal histories, menstrual history, age at menarche, date of LMP, obstetric history, contraception history and family history). Full complete and gynecological examinationwere performed then TVUS and office hysteroscopy was done.

Endometrial samples were collected either by using hysteroscopy or during D&C. Endometrial biopsies were taken under direct vision using a resectoscope. Uterine curettage when performed, it was done under spinal anesthesia or sedation with conventional curette and biopsy of the uterine cavity. Samples were placed in formalin prior to inspection by a pathologist. The histopathology of collected specimens was compared with the endometrial pathology obtained by TVUS and hysteroscopy.

Laboratory investigations were also performed (complete blood count, Rh classification, FBG, tests for the liver and kidneys, coagulation profile, electrocardiogram, hepatitis viruses, pregnancy test).

STATISTICAL ANALYSIS:

The collected data was edited, coded, tabulated, and imported into the Statistical Package for Social Science (IBM Corp., released 2017) using a PC. IBM Corp., Armonk, NY, published IBM SPSS Statistics for Windows, Version 27.0. Data were shown, and the proper analysis was done based on the type of data that was discovered for each parameter.

RESULTS:

Ultrasonographic examination of patients revealed that 25.8% had thick endometrium, 17.5% had adenomyosis, 31.7% had fibroid, and 6.7% had polyp. Hysteroscopic examination of patients revealed that 35% had endometrial hyperplasia, 25.8% had fibroid, 13.3% had adenomyosis, 8.3% had cervical polyp, 1.6% had findings of tubo-ostial membrane, cervical mass and two patients with cancer, five patients with Nabothian cyst.

Ultrasonography can diagnose endometrial hyperplasia in 19 out of 45 proven by HPE with 42.2% sensitivity and can rule out endometrial hyperplasia in 63 out of 75 patients without ET with 84% specificity, positive predictive value was 67.3%, negative predictive value 70.8% and overall accuracy 68.3% (Table 1).

Hysteroscopy can diagnose endometrial polyp in 28 out of 46 proven by HPE with 60.9% sensitivity and can rule out endometrial polyp in 69 out of 74 patients without endometrial polyp with 93.2% specificity, positive predictive value was 84.8%, negative predictive value 79.3% and overall accuracy 72.5% (table 2).

Hysteroscopy can diagnose cervical polyp in 7 out of 9 proven by HPE with 77.8% sensitivity and 97.3% specificity, positive predictive value was 70%, negative predictive value 98.2% and overall accuracy 95.8% (Table 3).

Ultrasonography can diagnose fibroid in 27 out of 36 proven by HPE with 75% sensitivity and 86.9% specificity, positive predictive value was 71.1%, negative predictive value 89% and overall accuracy 73.3% (Table 4).

Hysteroscopy can diagnose fibroid in 19 out of 36 proven by HPE with 52.8% sensitivity and 87.5% specificity, positive predictive value was 61.3%, negative predictive value 80.9% and overall accuracy 75.8% (Table 5).

Ultrasonography can diagnose adenomyosis in 5 out of 7 proven by HPE with 71.4% sensitivity and can rule out adenomyosis in 97 out of 113 patients without adenomyosis with 86% specificity, positive predictive value was 24%, negative predictive value 98% and overall accuracy 85% (Table 6).

Hysteroscopy can diagnose adenomyosis in 7 out of 9 proven by HPE with 77.8% sensitivity and can rule out adenomyosis in 104 out of 111 patients without adenomyosis with 91.9% specificity, positive predictive value was 43.8%, negative predictive value 98.1% and overall accuracy 90.8% (Table 7).

Table (1) Performance of ultrasonography in diagnosis of endometrial hyperplasia by US as confirmed by histopathological examination

	Endometrial hyperplasia (HPE)	Absent	Total
Endometrial hyperplasia (US) **Present** **Absent**	19 26	12 63	31 89
Total	45	75	120

Table (2) Performance of hysteroscopy in diagnosis of endometrial polyp as confirmed by histopathological examination

	Endometrial polyp (HPE)	Absent	Total
Endometrial polyp (hysteroscopy) **Present** **Absent**	28 18	5 69	33 87
Total	46	74	120

Table (3) Performance of ultrasonography in diagnosis of cervical polyp as confirmed by histopathological examination:

	Cervical polyp (HPE)	Absent	Total
Cervical polyp (US) **Present** **Absent**	7 2	3 108	10 110
Total	9	111	120

Table (4) Performance of ultrasonography in diagnosis of fibroid as confirmed by histopathological examination

	Fibroid (HPE)	Absent	Total
Fibroid (US) **Present** **Absent**	27 9	11 73	38 82
Total	36	84	120

Table (5) Performance of hysteroscopy in diagnosis of fibroid as confirmed by histopathological examination

	Fibroid (HPE)	Absent	Total
Fibroid (hysteroscopy) **Present** **Absent**	19 17	12 72	31 89
Total	36	84	120

Table (6) Performance of ultrasonography in diagnosis of adenomyosis as confirmed by histopathological examination

	Adenomyosis (HPE)	Absent	Total
Adenomyosis (US) **Present** **Absent**	5 2	16 97	21 99
Total	7	113	120

Table (7) Performance of hysteroscopy in diagnosis of adenomyosis as confirmed by histopathological examination

	Adenomyosis (HPE)	Absent	Total
Adenomyosis (hysteroscopy) **Present** **Absent**	7 2	9 102	16 104
Total	9	111	120

DISCUSSION:

In the current study, ultrasonographic examination of patients revealed that 25.8% had thickened endometrium, 17.5% had adenomyosis, 31.7% had fibroid, and 6.7% had endometrial polyp. **Agrawal et al[14]** mentioned that the commonest lesion diagnosed by TVS is endometrial hyperplasia which was found in 58% cases followed by endometrial polyp in 20% cases and normal endometrium in 15% cases. Other findings were submucous fibroid in 5% cases and cervical polyp in 1.25% cases. Similarly, **Jadhav & Yadav[15]** reported that the commonest lesion diagnosed by TVS is endometrial hyperplasia which was found in 59 % of patients followed by endometrial polyp in 20% of patients. In addition,

submucous fibroid was diagnosed in 5% of patients and cervical polyp in 1 % of patients.

The current study results revealed that hysteroscopic examination of patients showed that 35% had endometrial hyperplasia, 25.8% had fibroid, 13.3% had adenomyosis, 8.3% had cervical polyp, 1.6% had findings of tubo-ostial membrane, cervical mass and two patients with cancer. Reported that in 50 females presented with AUB, hysteroscopy showed that 36% had endometrial hyperplasia, 6% had adenomyosis, 2% had cervical polyp and 4% had endometrial cancer. **Agrawal et al[14] and Jadhav & Yadav[15]** reported also that hysteroscopy revealed a diagnosis of endometrial hyperplasia in 20%, fibroid in 7.5% and cervical polyp in 5% of patients. **Al Hasan et al[16]** performed hysteroscopic examination of perimenopausal females with AUB. Of included patients, 12% had endometrial hyperplasia, 5% had fibroid, 48% had endometrial polyp and 4% had cervical polyp.

In the current study histopathology of patients revealed that 38.3% had endometrial polyp, and 37.5% of them had endometrial hyperplasia. Histopathologic analysis reported that 44% had endometrial hyperplasia and 6% had 4% had endometrial cancer, and 4% had endometrial polyps. Analysis of the study's histopathology by **Jadhav & Yadav[15]** stated that the most frequent finding observed was an endometrial polyp in 41.25% of patients. The other findings included endometrial hyperplasia 20%, submucous myoma or myomatous polyp 7.5%, cervical polyp 5% of patients.

Evaluation of the ultrasonography's sensitivity and specificity and hysteroscopy in the current study revealed that ultrasonography can diagnose endometrial hyperplasia with 42.2% sensitivity with 84% accuracy overall, specificity, negative predictive value of 70.8%, and positive predictive value of 67.3% 68.3%. These results were comparable with results reported by **Wanderley et al[17]** as TVUS in diagnosis of endometrial hyperplasia had a sensitivity of 58.3%, specificity of 68.1%, positive predictive value 15.6%, negative predictive value 94.2% and accuracy of 63.2%.

Agrawal et al [14] reported better results as while utilizing the endometrial hyperplasia diagnosis TVUS. TVUS had a sensitivity of 96.49%, specificity of 43.48%, PPV of 80.88%, NPV of 83.33% and accuracy of 81.25%. These results are similar to those of previously published studies. **Grimbizis et al[18]** found that TVUS had sensitivities of 89.04 and a 56% specificity in identifying any endometrial disease **El-khayat et al[19]** observed an overall sensitivity of 92.3%, specificity of 72.72%, PPV of 92.3%, NPV of 72.72% and accuracy of 88% for TVUS.

In the current study, hysteroscopy can diagnose endometrial polyp with 60.9% sensitivity 93.2% specificity, positive predictive value was 84.8%, negative predictive value 79.3% and overall accuracy 72.5%. in addition, hysteroscopy can diagnose cervical polyp 77.8% sensitivity and 97.3% specificity, positive predictive value was 70%, negative predictive value 98.2% and overall accuracy 95.8%. Better results were reported previously compared to our results, **Wanderley et al[17]** reported that hysteroscopy can diagnose endometrial polyp with 84.4% sensitivity 100% specificity, positive predictive value was 100%, negative predictive value 87.5% and overall accuracy 92.2%. Similarly, **Maiti et al[20]** also reported that – regarding endometrial polyp-hysteroscopy had a sensitivity of 98.24%, specificity of 82.61%, PPV of 93.33%, NPV of 95% and accuracy of 93.75%.

In the current study, ultrasonography can diagnose fibroid with 75% sensitivity and 86.9% positive predictive value of 71.1%, specificity, and negative predictive value 89% and overall accuracy 73.3%. These results were a little different from results of study was conducted by **Soljačić Vraneš et al[21]** and mentioned that TVUS can diagnose fibroid with 69.2% sensitivity and 91.3% positive predictive value of 55%, specificity, and negative predictive value 3.3%. In the same context, better results were mentioned by **Yenigul et al[22]** reported that TVUS can diagnose fibroid with 77.8% sensitivity and 98.4% specificity.

Concerning diagnosis of fibroids, the current study revealed that hysteroscopy can diagnose fibroid with 52.8% sensitivity and

87.5% positive predictive value and specificity was 61.3%, negative predictive value 80.9% and overall accuracy 75.8%. **Wanderley et al[17]** shown that hysteroscopy may identify fibroid with an accuracy of 89.5% overall, 100% specificity, 100% positive predictive value, and 98.3% negative predictive value 94.7%. Furthermore, **Al Hasan et al[16]** reported that hysteroscopy in the diagnosis of fibroids had 100% sensitivity and 100% specificity, positive predictive value was 100%, negative predictive value 100% and overall accuracy 100%.

Regarding diagnosis of adenomyosis, the current study results showed that ultrasonography can diagnose adenomyosis with 71.4% sensitivity, 86% specificity, positive predictive value was 24%, negative predictive value 98% and overall accuracy 85%. TVUS Has been reported to be a diagnostic tool for adenomyosis, with a range of 65 to 81% sensitivity and from 65 to 100%**[23]**. **Di Donato et al[24]** reported a sensitivity of 92% and a specificity of 88% of 2D-TVS in a group of 50 patients. **Dakhly et al[25]** reported a sensitivity of 83.95% and a specificity of 60% of TVUS yielded the identification of 292 patients who had a clinical suspicion of having adenomyosis. The specificity rose when hysteroscopic endomyometrial biopsy was combined with to 89%.

Krentel et al[26] conducted s systematic review to evaluate the efficiency of different diagnostic tools in adenomyosis. The authors were Taking into account four seemingly comparable investigations, TVUS's stated sensitivity and specificity for the diagnosis of adenomyosis varies from 87.1% to 57.4% and 97.5% to 60.1% in addition, **Gordts et al[27]** revealed that the sensitivity and specificity of the TVUS were 72% and 81%, respectively, in the diagnosis of adenomyosis.

Since hysteroscopy can identify adenomyosis, its use in the diagnosis of the condition was advantageous with 77.8% sensitivity with 91.9% specificity, positive predictive value was 43.8%, negative predictive value 98.1% and overall accuracy 90.8%. As far as we are aware, this study is the first to discuss the precise efficacy of hysteroscopy in adenomyosis diagnosis.

Dakhly et al [25] examined the reliability of endometrial biopsy collected by office hysteroscopy for adenomyosis histopathologic confirmation. Enhancing the TVS result using a hysteroscopic endometrial biopsy increased the specificity from 60 to 89%. Hysteroscopy in adenomyosis is not only a diagnostic tool but also a less invasive method for treating polypoid or sub-endometrial cystic adenomyomas with monopolar or bipolar hysteroscopic excision **[25].**

Conclusion:

Ultrasonography and hysteroscopy can diagnose endometrial pathologies in patients with perimenopausal abnormal uterine bleeding with variable degrees of sensitivity and specificity as proved by histopathological examination. However, hysteroscopy proved to have the upper hand as it provides the utility of endometrial tissue sampling. Considering the use of warm saline in the process of office hysteroscopy to decrease pain and discomfort associated with this procedure, Considering TVUS and hysteroscopy for diagnosis of endometrial pathology.

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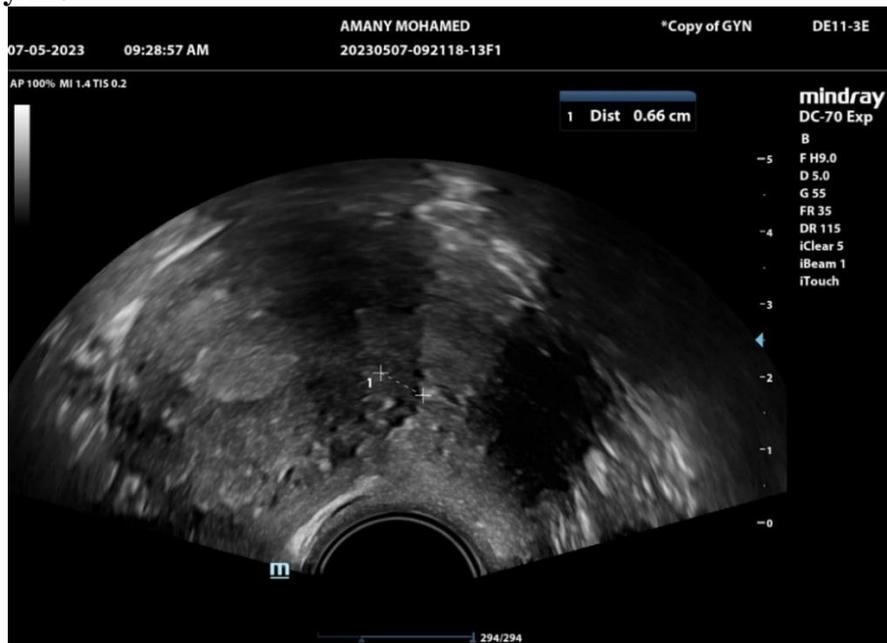**26- Krentel H, Cezar C, Di Spiezio Sardo A, Tanos V, Wallwiener M, De Wilde RL,** From Clinical Symptoms to MR Imaging: Diagnostic Steps in Adenomyosis. *BioMed Res Int*, *2017*, 1514029.

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Supplementary file

S1 Figure (1): TVUS showing endometrial polyp

S2 Figure (2): TVUS showing endometrial adenomyosis

S3 Figure (3): TVUS showing thickened endometrium
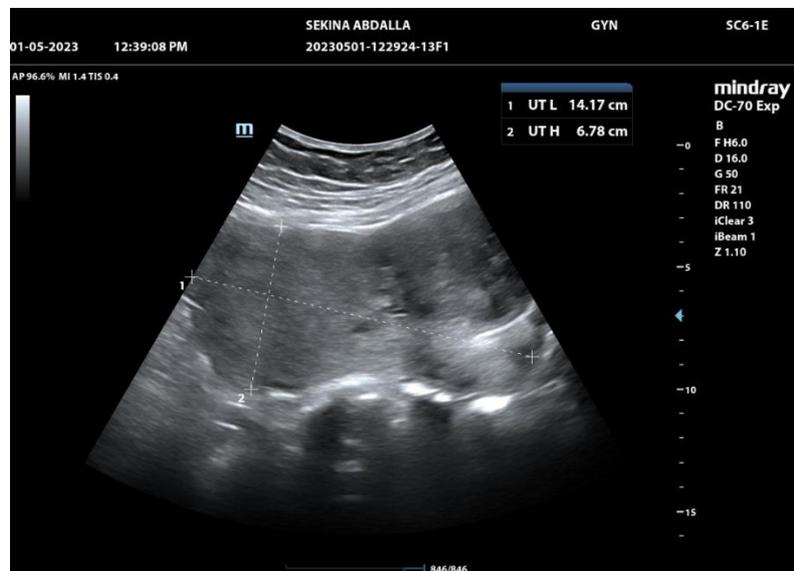
S4 Figure (4): TVUS showing subserous fibroid
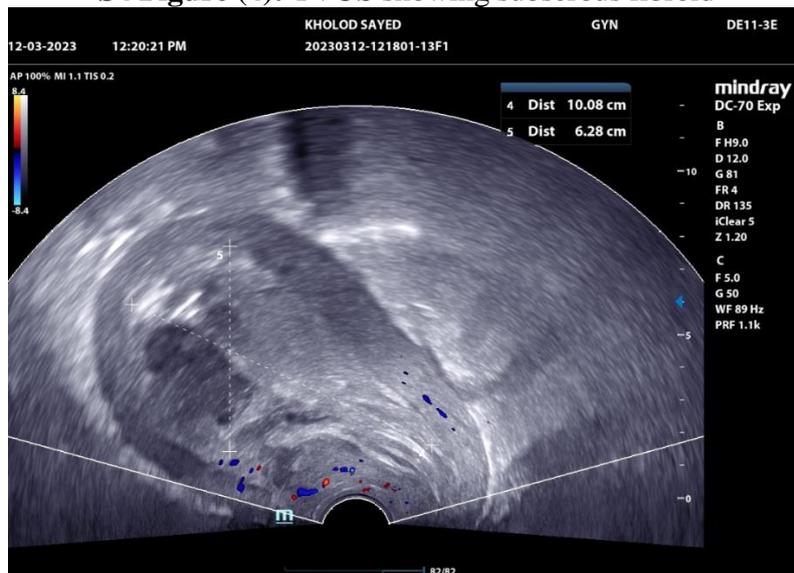
S5 Figure (5): TVUS showing submucous fibroid
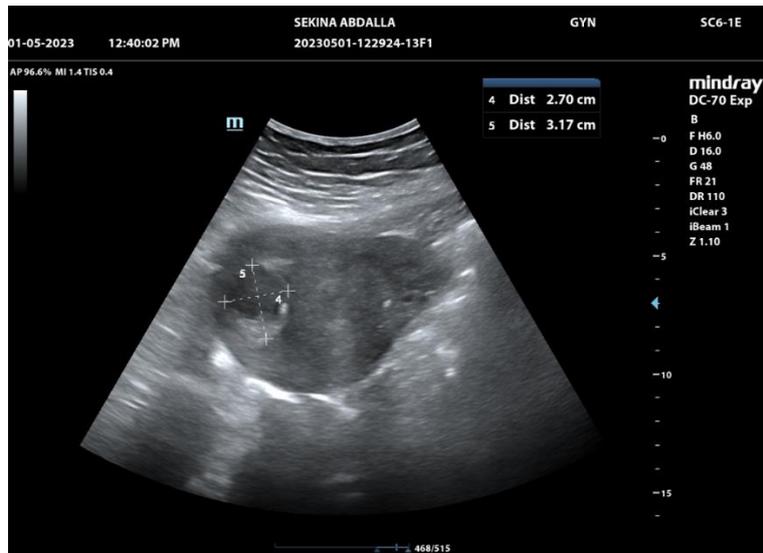
S6 Figure (6): TVUS showing interstitial fibroid

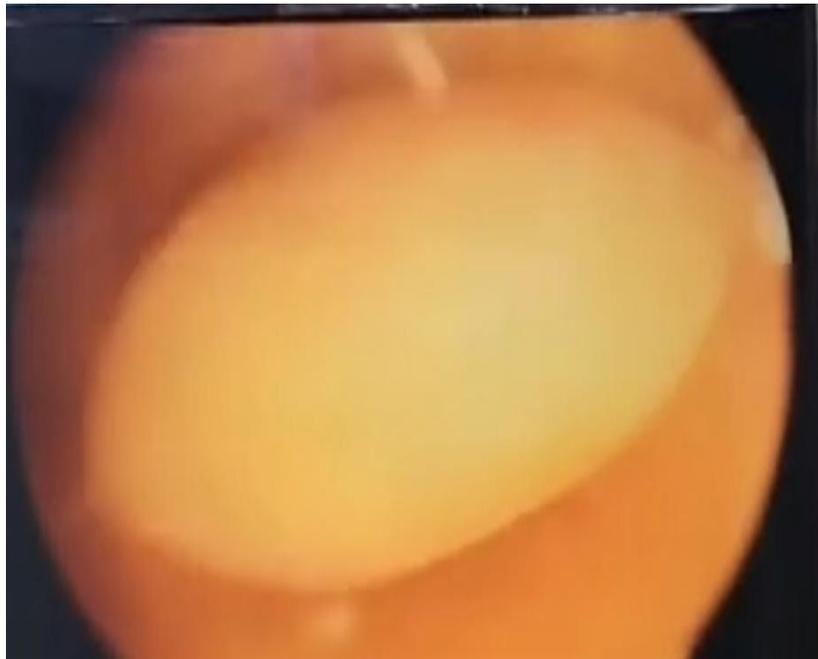**S7 Figure (7):** Diagnostic hysteroscopy showing localized thickened endometrium
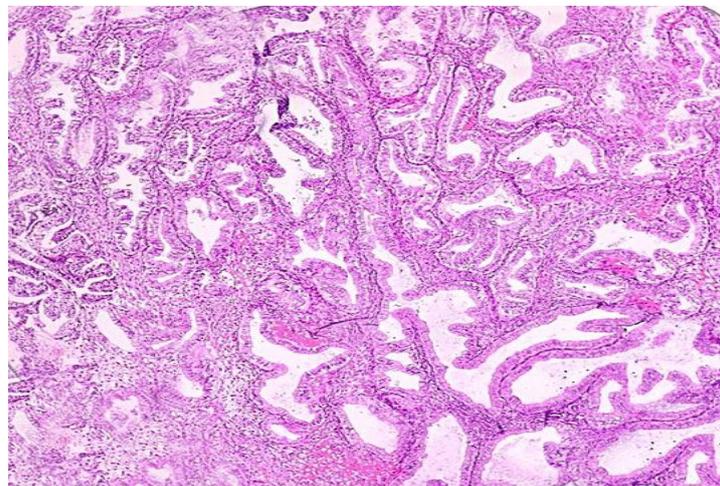
S8 Figure (8): Histopathological analysis of endometrial biopsy showing atypical endometrial hyperplasia showing back-to-back glands (H&E x200)
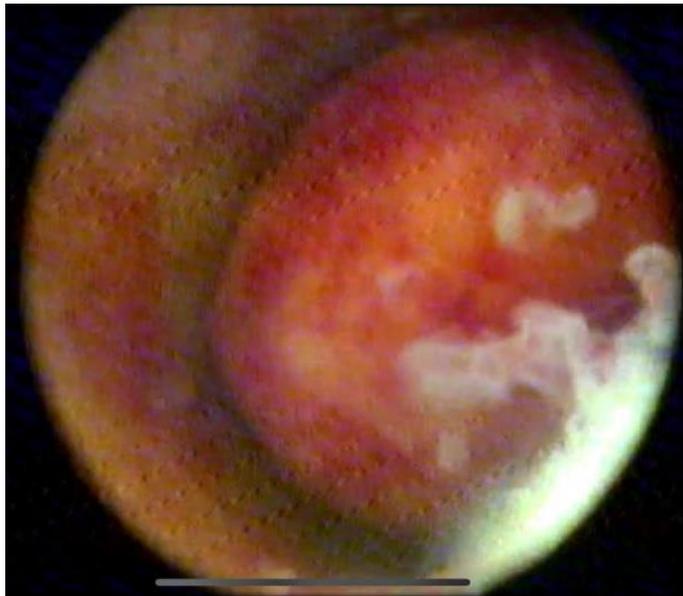
S9 Figure (9): Diagnostic hysteroscopy showing submucous fibroid polyp
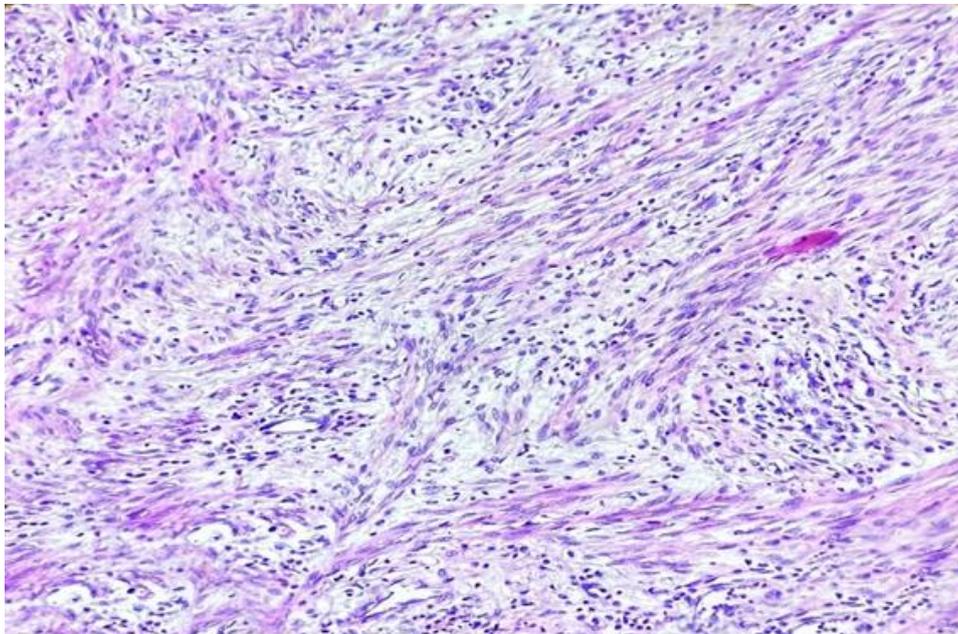
S10 Figure (10): Histopathological analysis of endometrial biopsy showing section in leiomyoma revealing hypercellular intersecting fascicles formed of spindle cells with scant cytoplasm (H&E x400)

S11 Figure (11): Diagnostic hysteroscopy showing endometrial polyp
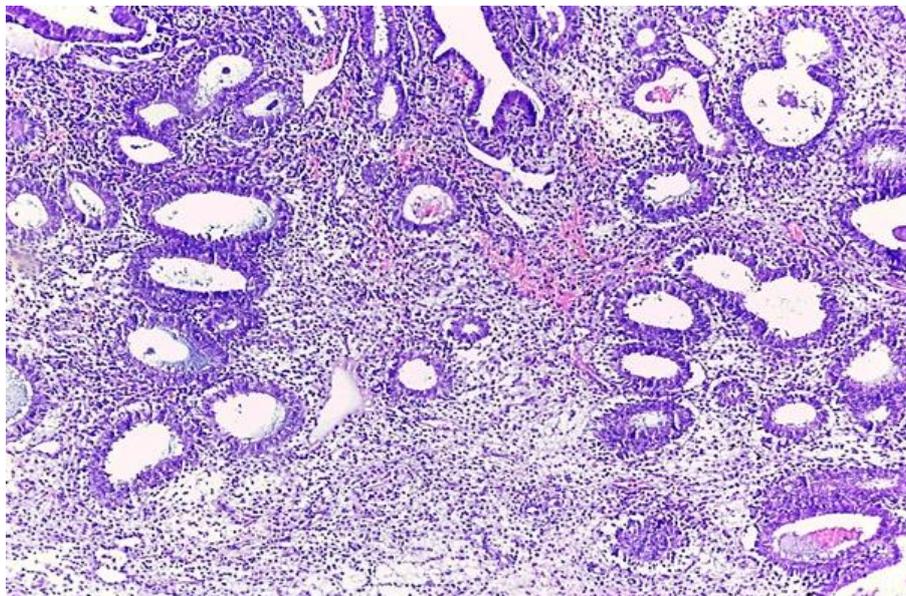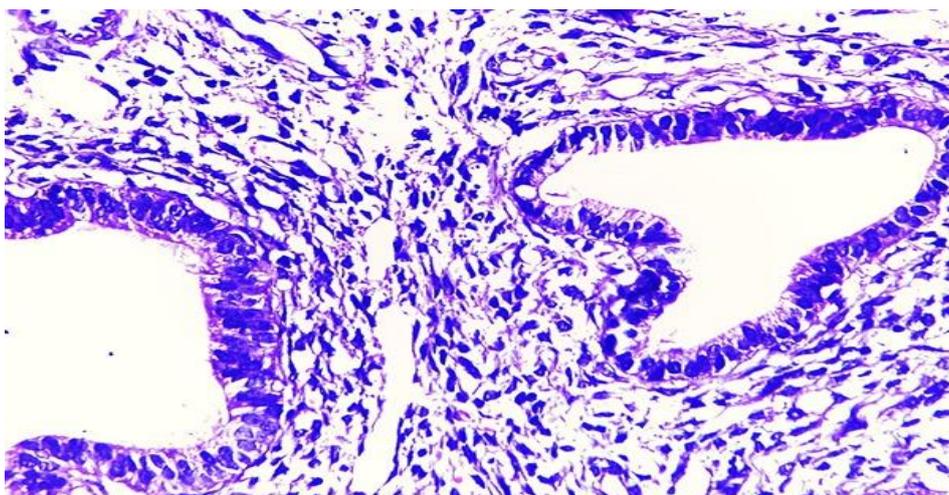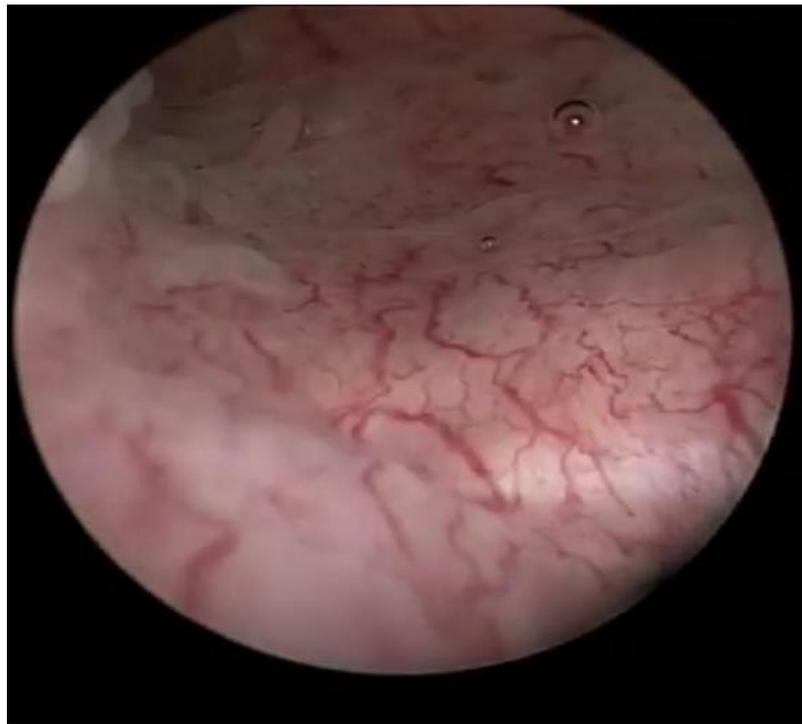

S12 Figure (12): Histopathological analysis of endometrial biopsy showing endometrial polyp revealing hyperplastic and proliferative endometrium with thick walled blood vessels (H&E x200)
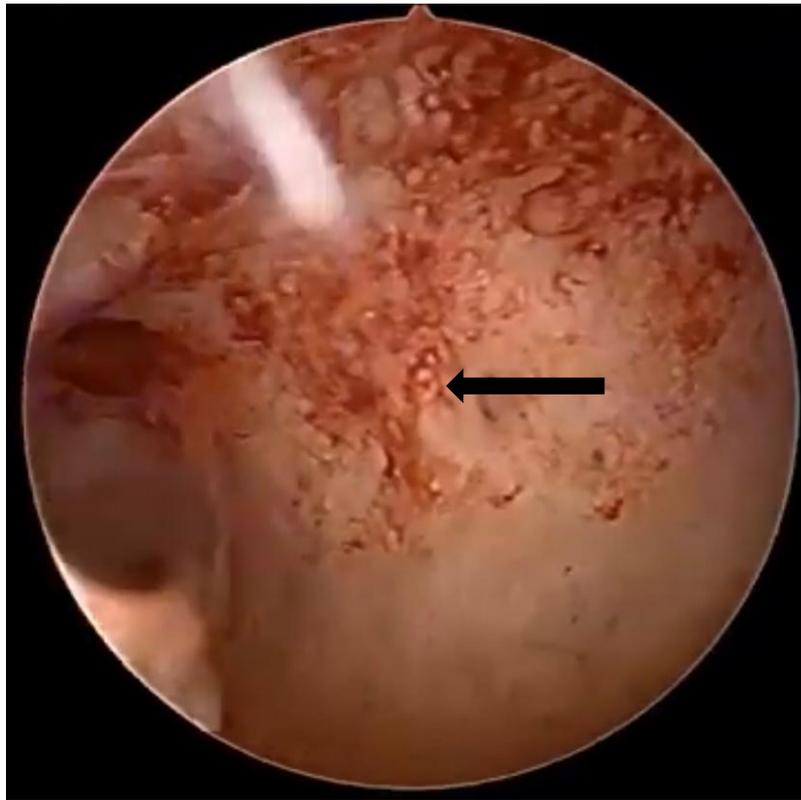
S13 Figure (13): Diagnostic hysteroscopy showing adenomyosis, Black arrow: openings, sinuses/diverticuli and irregular surface
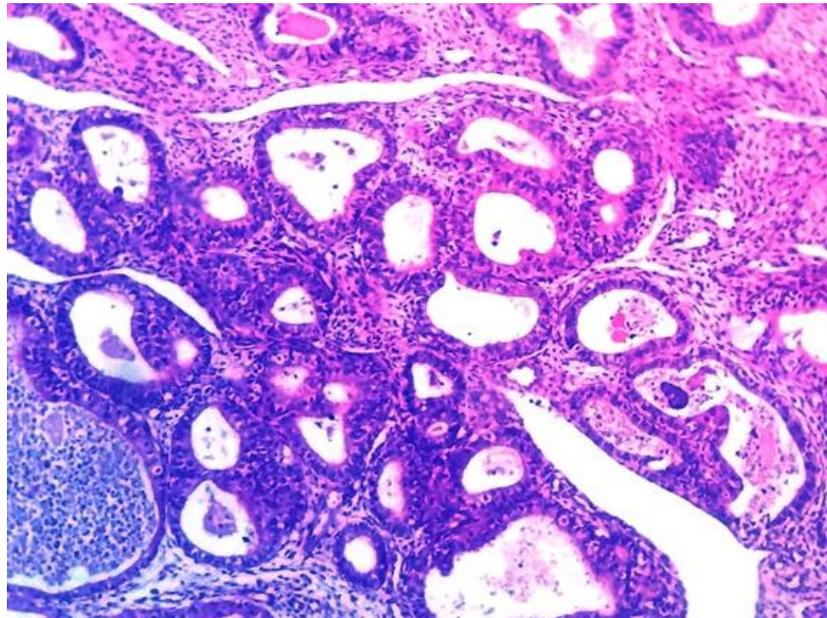
S14 Figure (14): Histopathological analysis of endometrial biopsy showing section of adenomyosis (H&E x200)

S16 Figure (16): Histopathological analysis of endometrial biopsy showing endometrial atrophy with cystically dilated glands lined by columnar epithelium (H& E x200)