



Original article

Sonographic findings in symptomatic patient with adenomyosis uteri

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Abstract

Adenomyosis is a benign uterine disorder where endometrial glands and stroma are pathologically demonstrated within the uterine myometrium. The pathogenesis involves sex steroid hormone abnormalities, inflammation, fibrosis and neuroangiogenesis, even though the proposed mechanisms are not fully understood, the different type and extension of adenomyosis detected by transvaginal ultrasound could be associated with clinical symptoms. The current study was designed with an aim to correlate between ultrasound finding in symptomatic patient with adenomyosis and severity of the disease. It was a cross sectional study conducted on 100 symptomatic women with sonographic criteria of adenomyosis recruited from the outpatient gynecology and obstetrics clinic after proper counseling, history taking and ultrasound examination to detect ultrasound criteria of adenomyosis and doppler on uterine artery done to all patients to detect uterine artery resistance index, pulsatility index and V_{max} . There is a relation between Tumor vascular pattern and

abnormal uterine bleeding mainly and chronic pelvic pain. We found non-statistically significant differences between sonographic findings and symptoms among the studied population.

1. Introduction:

Adenomyosis is a common disorder defined as the presence of endometrial glands and stroma within the uterine myometrium [1]. It is associated with heavy menstrual bleeding, pain, and infertility [2]. It occurs when the normal boundary between the endometrial basal layer and the myometrium is disrupted. The cause of this disruption is not fully understood but may be due to uterine trauma, pregnancy, postpartum endometritis, or cesarean delivery. As a result of this disruption, the endometrial glands invade the myometrium, resulting in ectopic intramyometrial glands, which are associated with adjacent myometrial hypertrophy [3].

The clinical presentation of adenomyosis is the parous, perimenopausal patient with dysmenorrhea and menorrhagia. Physical examination may reveal an enlarged, tender uterus, but the diagnosis has been difficult to obtain without histologic confirmation [4]. The preoperative diagnosis of adenomyosis

remains elusive, although the use of sonography and MR imaging improves the diagnosis, with high sensitivities reported for MR imaging in high-prevalence populations. However, as transvaginal imaging techniques have improved, the diagnostic accuracy of US has become comparable to that of MRI [5].

A study by *Reinhold et al.*, [6] reported that transvaginal US was as accurate as MRI in diagnosing adenomyosis. This comparison study, which used the histopathology of hysterectomy specimens as the standard, found no statistical difference between sensitivities and specificities of transvaginal US and MRI (transvaginal US, 89% and 89%, respectively; MRI, 86% and 86%, respectively). Based on its efficacy, as well as safety, widespread availability, and lower cost relative to that of MRI, transvaginal US should be considered the primary imaging modality for the diagnosis of adenomyosis.

The typical ultrasound findings, including an enlarged uterus, heterogeneous poorly circumscribed areas within the myometrium, increased echotexture of the myometrium and asymmetrical thickening of the myometrial wall, were all considered highly indicative of the presence of adenomyosis. Patients usually present with uterine tenderness and enlargement, dysmenorrhea, and menorrhagia. Symptoms are nonspecific. Some or all of the symptoms may be encountered with dysfunctional uterine bleeding, pelvic congestion syndrome, leiomyomata, endometriosis, endometrial polyps, and endometrial carcinoma [7].

Some authors suggest that the severity of symptoms and the clinical features correlate with the extent and depth of adenomyosis, however, the only classification proposed for the extension of the disease is based on histological findings after surgery and not on imaging [8].

Since adenomyosis often results in poorly defined lesions, possibly disseminated in different parts of the myometrium, it is difficult to express its severity in quantitative terms. Through TVS it is possible to assess the characteristics of adenomyosis. Therefore, recently we have

proposed a scoring system [9] that grades the type of adenomyosis and its extension inside the uterus. We conducted the current study with an aim to correlate between ultrasound finding in adenomyosis symptomatic patients with severity of the disease.

2. Patients and Methods:

2.1. Study Design:

This was a cross sectional study performed in department of obstetrics and gynecology at Beni-Suef university hospital within 10 months from July (2020) to May (2021), the study was approved by the local research ethics committee. A total of 100 women, between 25 to 35 years old were included in the current study based on presence of symptoms and ultrasound criteria of adenomyosis according to previous studies.

Patient with endometrial lesion, fibroids, adnexal lesion, coagulopathy, coagulation disorder, history suggested of PID, tube-ovarian abscess, IUD and lactating mothers were excluded from the current study.

2.2. Methods:

- 1) A complete medical, surgical and obstetrical history including age, body

mass index (kg/m²), gravidity and parity were recorded

- 2) Prior the TVS scan, the presence of painful symptoms (including dysmenorrhea, dyspareunia and dysuria), heavy menstrual bleeding and /or infertility were evaluated. Symptom intensity was evaluated through the visual analogue scale (VAS) system, using a 10-cm line with the extreme points 0 and 10 corresponding to “no pain” to “maximum pain”, respectively. Severe symptoms were considered if VAS score was equal or more than 5.
- 3) The presence of abnormal uterine bleeding (AUB) was investigated, the amount of menstrual loss was assessed using the pictorial blood loss analysis chart (PBAC), that provides a score depends on the number of tampons or sanitary towels used during the menstrual cycle and also on the degree to which each item is soiled. PBAC score has been shown to have a high specificity and sensitivity when used as a diagnostic test for objective menstrual bleeding [10] and the PBAC score more than 100 is consistent with menorrhagia.
- 4) Complete blood picture (CBC) for anemia, thrombocytopenia bleeding

profile, kidney function tests and liver function tests done.

- 5) All transvaginal ultrasound examinations were performed by two experienced sonographers and carried out using 2D Ultrasound (MindryDCN2 & XARIO 200), ultrasonography criteria to make a diagnosis of adenomyosis were described as follows: asymmetrical thickening of uterine walls, intra-myometrial cysts or hyperechoic islands (or both), fan shaped shadowing of the myometrium, myometrial echogenic sub-endometrial lines and buds, trans-lesional vascularity and irregular or interrupted JZ.

2.3.Statistical Analysis:

Statistical analysis was undertaken using the Statistical Package for the Social Sciences (SPSS, version 15.0, Chicago, IL, USA). All continuous variables were expressed in terms of mean \pm SD, while categorical variables were expressed in terms of frequency and percentage. Comparison of numerical variables between the study groups will be analyzed with the independent-samples t-test, for categorical data as all complications e.g. bleeding, infertility dysmenorrhea etc. Chi square (χ^2) test was performed. Statistical significance

was set at a probability value (P value \leq 0.05).

3. Results:

The current study included 100 women aged from 25 to 35 years old with an average age of (29.25 \pm 2.9), BMI was ranged from 24 to 35 kg/m² with an average BMI of (29.36 \pm 3.3), parity was ranged from nulliparous to 4 times with an average parity of (1.7 \pm 1.6). All women in the current study underwent

complete blood count, the average Hb level was (9.4 \pm 0.8), average PLT count was (217.84 \pm 55.2), average WBC count was (7.60 \pm 0.9). Regarding liver functions, ALT average was (22.9 \pm 4.9), AST average was (23.15 \pm 4.7). Regarding renal functions, Urea average was (16.7 \pm 5.2) while creatinine average was (1.02 \pm 0.1), Table-1 demonstrates the baseline demographic and laboratory data of the studied women.

Table (1): baseline demographic and laboratory data of the studied women; (N= 100):

	Minimum	Maximum	Mean	Std. Deviation
Age	25.00	35.00	29.2	2.9
Parity	0.00	4.00	1.7	1.6
BMI	24.00	35.00	29.3	3.2
Hb	8.00	11.00	9.4	0.8
PLT	122.00	300.00	217.8	55.2
WBC	5.70	9.00	7.6	0.9
ALT	15.00	30.00	22.9	4.9
AST	15.00	30.00	23.1	4.7
Creatinine	0.84	1.21	1.02	0.1
Urea	7.00	25.00	16.7	5.2

TVU evaluation of the studied women demonstrated that, asymmetrical thickening of uterine walls was detected in 82%, intra-myometrial cysts in 46%, hyperechoic islands 20%, fan-shaped shadowing of the myometrium in 18%, tumor vascular pattern

in 66% and trans-lesional vascularity in 54% of the examined women as demonstrated in (Figure-1). Regarding clinical symptoms, abnormal uterine bleeding among 63%, chronic pelvic pain among 61% and dysmenorrhea symptoms among 25% as demonstrated in (Figure-2).

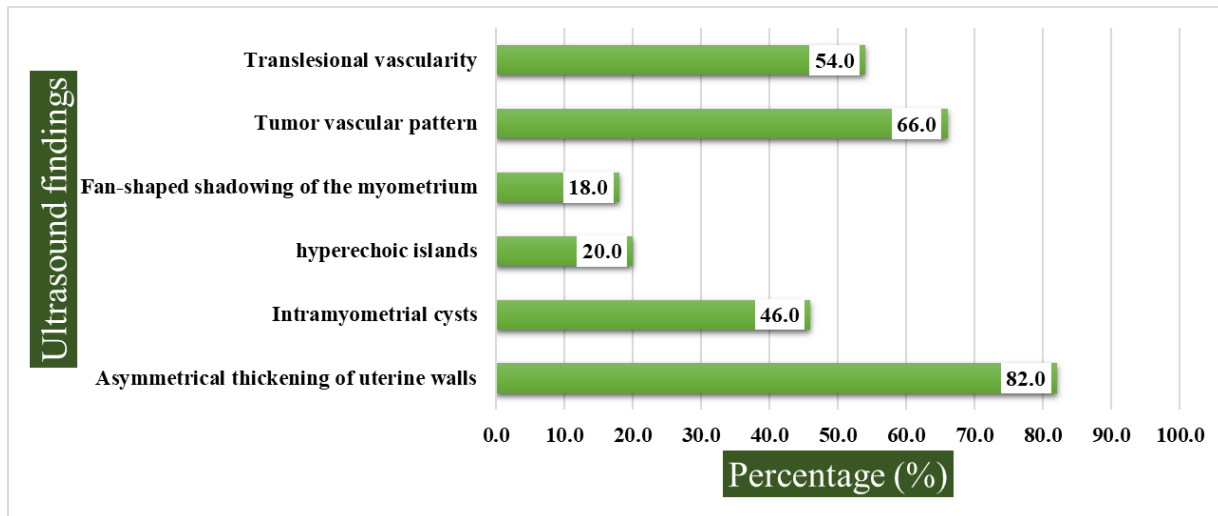


Figure (1): Trans-Vaginal Ultrasound Assessment of the Studied Adenomyosis Women.

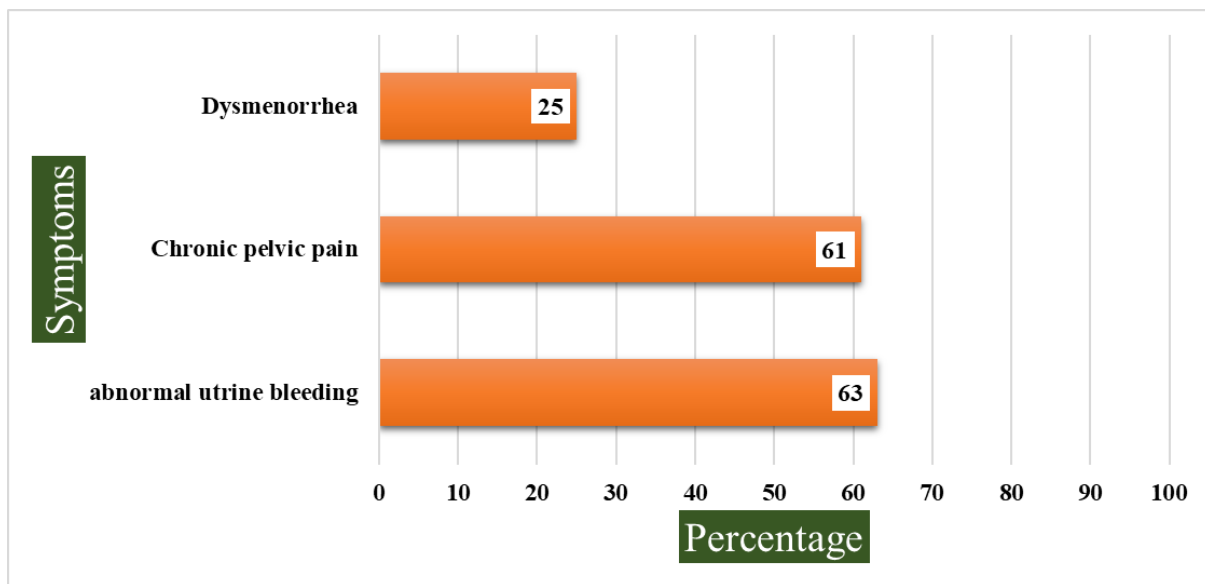


Figure (2): Clinical Symptoms among Studied Adenomyosis Women.

Statistical analysis of clinical symptoms with TVU findings demonstrate that, there was no statistical significance regarding Asymmetrical thickening of uterine walls, Intramyometrial cysts, hyperechoic islands and Fan-shaped shadowing of the

myometrium with all clinical symptoms recorded in the current study (p-values >0.05). While there was a significant association between tumor vascular pattern, (P= 0.05) and with trans-lesional vascularity (P= 0.032) with all clinical symptoms

recorded in the current study, (abnormal uterine bleeding mainly and chronic pelvic pain)

4. Discussion

Adenomyosis is a common benign disease of the uterus that has a reported incidence of 5–70% in surgical and postmortem specimens. Adenomyosis occurs when the normal boundary between the endometrial basal layer and the myometrium is disrupted. The cause of this disruption is not fully understood but may be due to uterine trauma, pregnancy, postpartum endometritis, or cesarean delivery [8]. Other disorders coexist with adenomyosis. Uterine leiomyomas are associated with adenomyosis in 36-50% of cases. Endometrial hyperplasia and carcinoma have also been reported to occur with greater frequency in women with adenomyosis than in women without adenomyosis, raising the question of hormonal influence [11].

As a result of this disruption, the endometrial glands invade the myometrium, resulting in ectopic intramyometrial glands, which are associated with adjacent myometrial hypertrophy. An adenomyoma is a focal form of adenomyosis and may be difficult to distinguish from uterine

leiomyoma on imaging. Endometrial hyperplasia and carcinoma have also been reported to occur with greater frequency in women with adenomyosis than in women without adenomyosis, raising the question of hormonal influence. The clinical presentation of adenomyosis is the parous, perimenopausal patient with dysmenorrhea and menorrhagia. Physical examination may reveal an enlarged, tender uterus, but the diagnosis has been difficult to obtain without histologic confirmation [12].

The clinical presentation of adenomyosis is the parous, perimenopausal patient with dysmenorrhea and menorrhagia. Physical examination may reveal an enlarged, tender uterus, but the diagnosis has been difficult to obtain without histologic confirmation. The preoperative diagnosis of adenomyosis remains elusive, although the use of sonography and MR imaging improves the diagnosis, with high sensitivities reported for MR imaging in high-prevalence populations [13].

The evaluation of endovaginal sonography in the diagnosis of adenomyosis has received attention, with small series reporting sensitivities and specificities of up to 87% and 98%, respectively. Because sonography is frequently the initial imaging

study in these patients, improving the diagnosis of this disease with sonography is important. The diagnosis of adenomyosis is frequently overlooked, especially in the presence of a fibroid uterus. Management, such as planning for myomectomy for uterine preservation, may be altered if extensive adenomyosis is suspected [12]. Furthermore, Levгур et al. (2000) found that menorrhagia was also related to the depth of the adenomyotic foci within the myometrium [13].

5. Conclusion and Recommendations

Transvaginal sonography is able to assess type and severity of adenomyosis. Our preliminary data showed differences between focal and diffuse adenomyosis regarding age, menstrual bleeding, infertility, and miscarriage. There is a relation between Tumor vascular pattern and abnormal uterine bleeding mainly and chronic pelvic pain. Statistical significance regarding Tumor vascular pattern with all symptoms groups ($P= 0.05$). Doppler study is much significant in correlation with symptoms of AUB and chronic pelvic pain NO statistical significance regarding asymmetrical thickening of uterine walls with all symptoms groups. We recommended further studies on larger

sample size and on large geographical scale to emphasize our conclusion. Further studies could be useful to confirm our findings and to determine if this new TVS assessment scheme may be helpful in selecting and evaluating the effectiveness of medical and surgical management, as well as the possible relationship between adenomyosis and infertility.

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