

Adenomyosis and Various Ultrasound Features – A Prospective Study

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Abstract

Introduction Adenomyosis is a common condition, usually affecting multiparous women over the age of forty. Transvaginal US should be considered the primary imaging modality for the diagnosis of adenomyosis. Nine ultrasonographic signs were described as features of adenomyosis which include globular uterus, myometrial cysts, asymmetrical thickening of uterine walls, hyperechoic islands, fan-shaped shadowing, echogenic subendometrial lines and buds, translesional vascularity, irregular junctional zone and interrupted junctional zone

Objective: This prospective study was carried out to see the distribution of these ultrasonic features among the patients of adenomyosis **Material and Methods:** 35 patients with ultrasound diagnosis of adenomyosis were recruited and age, parity, presenting complaint and various ultrasonic features suggestive of adenomyosis were noted **Results:** In our study, most common ultrasonic feature of adenomyosis noted was irregular junctional zone (100 %) followed by globular uterus (94%). Asymmetrical thickening of uterine walls, fan shaped shadowing, hyperechoic islands and myometrial cysts were other common findings. Interrupted junctional zone (25.7%) & translesional vascularity (17%) were least common features. Endometriotic cysts were present in 34% cases of adenomyosis **Conclusion:** Ultrasound is an important non-invasive, affordable and reliable modality for diagnosis of adenomyosis. Among various signs, irregular junctional zone and globular uterus are most common.

Keywords: Adenomyosis, Ultrasound signs

INTRODUCTION

Adenomyosis is a common condition, usually affecting multiparous women over the age of forty. On histology, it is characterised by the presence of ectopic endometrial mucosa within the myometrium (invagination of endometrium in the myometrium at a depth of at least 2.5 mm below the basal layer of the endometrium) that leads to hypertrophy of the smooth muscle, which confirms the diagnosis (1,2). It can be either focal (one or several foci in the myometrium) or diffuse (numerous foci spread throughout the myometrium) and it is often

asymmetric, predominating in the posterior uterine corpus. Adenomyosis may occur as a result of increased overgrowth of the endometrium with invasion of the underlying myometrium or the displacement of the endometrium during pregnancy, delivery, endometrial curettage, caesarean section, myomectomy, or metroplasty (3). The reported prevalence of adenomyosis varies widely from 5% to 70%, depending on the method used for diagnosis, with a mean prevalence of 20%–30% (4). Reported risk factors for adenomyosis include multiparity and previous uterine surgery (curettage and cesarean delivery), suggesting a possible role of damage to the endometrial–myometrial junction. While some patients may be asymptomatic, most experience menorrhagia, chronic pelvic pain, and dysmenorrhea. Diagnostic imaging allows for an *in vivo* diagnosis of adenomyosis and has broadened the understanding of this condition in women of all ages, including the role of adenomyosis in infertility (5). A study by Reinhold et al reported that transvaginal US was as accurate as MRI in diagnosing adenomyosis. 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 (6). The gold standard for the diagnosis of adenomyosis is histological examination of a hysterectomy specimen.

According to Van den Bosch T et al 2019, nine ultrasonographic signs were described as features of adenomyosis which include globular uterus, myometrial cysts, assymetrical thickening of uterine walls, hyperechoic islands, fan-shaped shadowing, echogenic subendometrial lines and buds, translesional vascularity, irregular junctional zone and interrupted junctional zone (7). This prospective study was carried out to see the distribution of these ultrasonic features among the patients of adenomyosis.

METHODS

Study Design – This was a prospective observational study conducted from december 2020 to february 2021 at Madaan Hospital, Gandhinagar, Jammu, Jammu & Kashmir , India.

Study population

Females who visited Gynae OPD in Madaan Hospital, Gandhinagar, Jammu, J&K and were diagnosed with adenomyosis on TVS ultrasound.

Inclusion Criteria

1. Non- pregnant females aged 20-50 years
2. Per vaginum examination with uterus corresponding to 6 weeks to 14 weeks in size
3. Ultrasound suggestive of adenomyosis

Exclusion criteria

1. Age < 20 years and > 50 years
2. Any other uterine abnormality like uterine anomaly, fibroid, endometrial polyp on ultrasound
3. Pregnant females

METHODOLOGY

35 patients with ultrasound diagnosis of adenomyosis were recruited and age, parity, presenting complaint and various ultrasonic features suggestive of adenomyosis were noted.

Transvaginal ultrasound (TVS)

Patient was examined first with full urinary bladder for the pelvis using 3.5 MHz curvilinear probe, voluson S8 version. Patient then was instructed to empty the bladder. A condom covered transvaginal 7.5 probe was then introduced per vagina. The uterus and ovaries were examined in all possible planes. Images were saved and sent to the picture archiving computer system (PACS).

STATISTICAL ANALYSES

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean \pm SD and Categorical variables were expressed as percentages. Distribution tables were used for data presentation.

RESULTS

The maximum number of patients were in age group 30-40 years (45%) followed by age group 40 -50 years (40%) (Table1). In our study maximum cases were in multipara (Table 2). In our study most common presenting symptom was chronic pain abdomen and heavy menstrual bleeding (34 % each) followed by infertility and dysmenorrhea (Table 3). In our study, most common ultrasonic feature of adenomyosis noted was irregular junctional zone (100 %) followed by globular uterus (94%). Assymetrical thickening of uterine walls, fan shaped shadowing, hyperechoic islands and myometrial cysts were other common findings. Interrupted junctional zone (25.7%) & translesional vascularity (17%) were least common features (Table 4). Endometriotic cysts were present in 34% cases of adenomyosis.

Table 1. Age distribution in patients of adenomyosis

Age (years)	n=35	Percentage (%)
20-30	5	14.20
30-40	16	45.70
40-50	14	40.00

Mean age - 38.23± 3.4 years

Table 2. Parity wise distribution of patients of adenomyosis

Parity	n=35	Percentage (%)
Nullipara	6	17.10
Para 1	6	17.10
Para 2	11	31.40
Para 3	12	34.28

Table 3. Distribution of symptoms in patients of adenomyosis

Symptoms	n=35	Percentage(%)
Chronic pain	12	34.20
HMB	12	34.20
Infertility	6	17.14
Dysmenorrhea	7	20.00

Table 4. Ultrasonographic features of patients of adenomyosis

S.No	Ultrasound Finding	n=35	Percentage(%)
1.	Globular Uterus	33	94.28
2.	Myometrial Cysts	12	34.28
3.	Asymmetrical thickening	24	68.50
4.	Hyperechoic islands	18	51.40
5.	Fan shaped shadowing	21	60.00
6.	Translesional vascularity	6	17.14
7.	Irregular Junctional Zone	36	100.00
8.	Interrupted Junctional Zone	9	25.71
9.	Others		

	Endometriotic cysts	12	34.28
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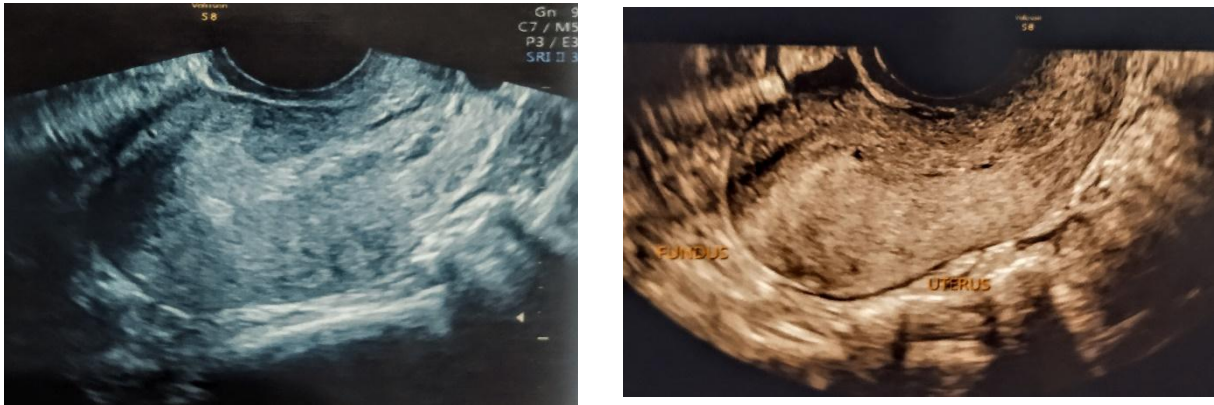


Figure 1. A) Irregular junctional zone B) Globular uterus with asymmetrical thickening of posterior uterine wall

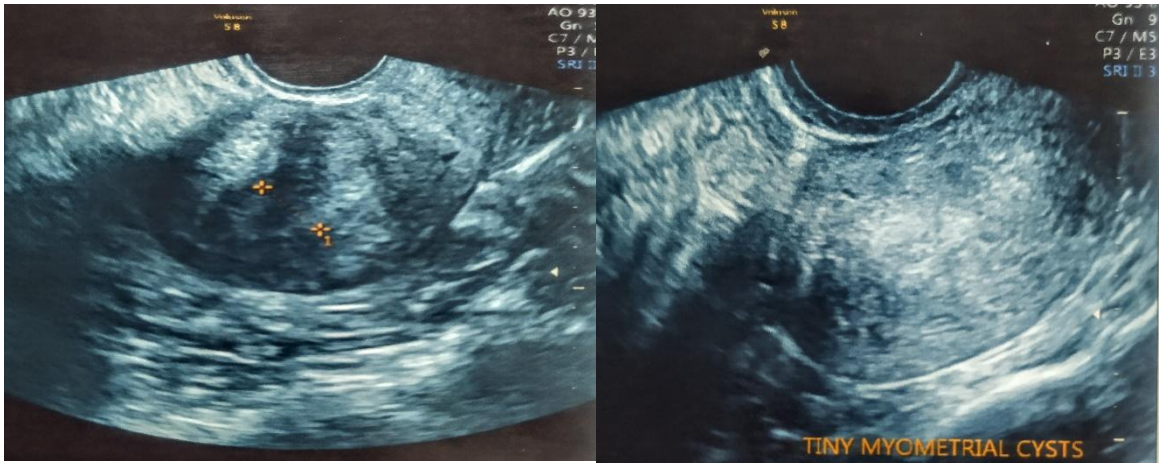


Figure 2. C) Fan-shaped shadowing D) Thin myometrial cysts

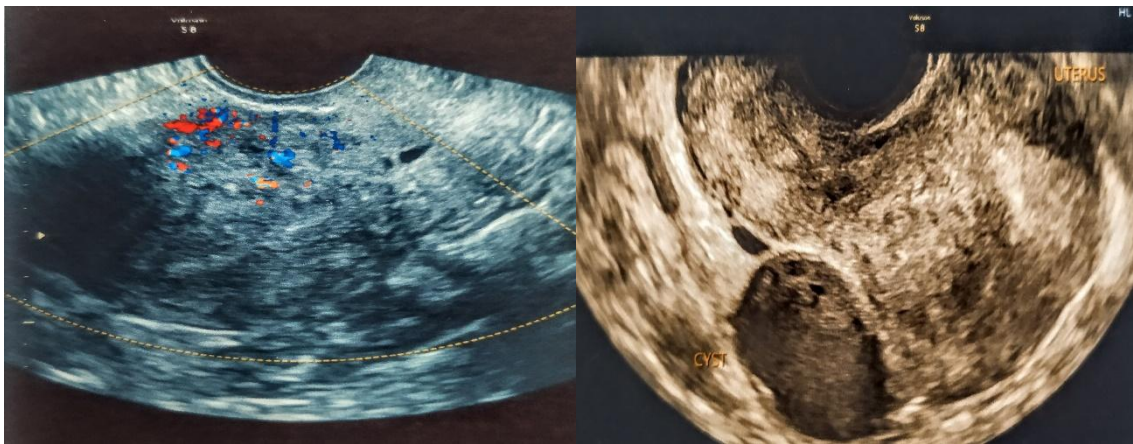


Figure 3. E) Translesional vascularity F) Adenomyotic uterus with endometriotic cyst

DISCUSSION

Adenomyosis is a common gynaecological condition and is usually asymptomatic. It presents with chronic pain abdomen, HMB, dysmenorrhea and infertility. Adenomyosis is generally diagnosed on histopathology. Ultrasound has emerged as non-invasive, affordable, easily available tool for diagnosis of adenomyosis. In our study, most common ultrasonic feature of adenomyosis noted was irregular junctional zone (100 %) followed by globular uterus (94%). Interrupted junctional zone (25.7%) & translesional vascularity (17%) were least common features.

In a study conducted by Kepkep et al. the sonographic features were compared with the histopathological results. Kepkep found that a regularly enlarged uterus with a globular appearance, subendometrial echogenic linear striations and myometrial cysts had the highest accuracy for the diagnosis of adenomyosis. They found that heterogeneous myometrium was most common finding in patients with adenomyosis (21/26 patients) (8).

Bromley B et al 2000 in their study on ultrasonic findings and diagnostic accuracy in patients of adenomyosis found that all patients with adenomyosis had a mottled heterogeneous appearing uterus, 95% had a globular uterus, 82% had small myometrial lucent areas, and 82% had an indistinct endometrial stripe (9).

According to Hamami A 2015, heterogeneous myometrium and ill definition of endometrial–myometrial interface were statistically significant good indicator for the diagnosis of adenomyosis. Heterogeneous myometrium was more prevalent and consistent indicator for the diagnosis of adenomyosis by ultrasound (10).

One limitation of our study is that histopathological diagnosis was not available. In addition, a number of limitations in diagnosing adenomyosis with endovaginal US must be emphasized. The technique is operator dependent, and the sonographic signs of adenomyosis may be subtle. Therefore, the accuracy of endovaginal US may depend on the sonologists experience to a much greater extent than it does with other pelvic abnormalities.

CONCLUSION

Ultrasound is an important non-invasive, affordable and reliable modality for diagnosis of adenomyosis. Now adenomyosis is becoming prevalent in ages less than 40 years also. Globular uterus and irregular junctional zone were most frequent findings on ultrasound. Asymmetrical thickening of uterine walls, fan shaped shadowing, hyperechoic islands and myometrial cysts were other common findings. Interrupted junctional zone (25.7%) & translesional vascularity (17%) were least common features. Endometriotic cysts were present in 34% cases of adenomyosis.

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REFERENCES

1. Seigler AM, Camilien I. Adenomyosis. J Reprod Med 1994; 39:841-53.
2. Hendrickson MR, Kempson RL. Non- neoplastic conditions of the myometrium and uterine serosa. In: Fox H, editor. Haines and Taylor obstetrical and gynecological pathology. Third edition Edinburgh, London, Melbourne and New York: Churchill Livingstone; 1987. P. 405-10.
3. Ferenczy A. Pathophysiology of adenomyosis. Hum Reprod Update 1998;4: 312-22.
4. Vercellini P, Viganò P, Somigliana E, Daguati R, Abbiati A, Fedele L. Adenomyosis: epidemiological factors. Best Pract Res Clin Obstet Gynaecol 2006;20(4):465-77.
5. Eisenberg VH, Arbib N, Schiff E, Goldenberg M, Seidman DS, Soriano D. Sonographic signs of adenomyosis are prevalent in women undergoing surgery for endometriosis and may suggest a higher risk of infertility. BioMed Res Int 2017; 2017:8967803.
6. Reinhold C, McCarthy S, Bret PM, et al. Diffuse adenomyosis: comparison of endovaginal US and MR imaging with histopathologic correlation. Radiology 1996;199(1):151-58.
7. Van den Bosch T, Dueholm M, Leone FP, Valentin L, Rasmussen CK, Votino A, et al. Terms, definitions and measurements to describe sonographic features of myometrium and uterine masses: a consensus opinion from the Morphological Uterus Sonographic Assessment (MUSA) group. Ultrasound Obstet Gynecol 2015; 46: 284 -98.
8. Kepkep K, Tuncay YA, Go'ynu'mer G, Tural E. Transvaginal sonography in the diagnosis of adenomyosis: which findings are most accurate? Ultrasound Obstet Gynecol 2007;30(3):341-45.
9. Bromley B, Shipp TD, Benacerraf B. Adenomyosis: sonographic findings and diagnostic accuracy. J Ultrasound Med 2000;19(8): 529-34.
10. Hamami A. What are the most reliable signs for the radiologic diagnosis of uterine adenomyosis? An ultrasound and MRI prospective. The Egyptian Journal of Radiology and Nuclear Medicine 2015; 46: 1349-55.