Can stored ultrasound images be used to identify adenomyosis? Assessing the interobserver variability in sonographic diagnosis of adenomyosis.

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Introduction:

The incidence of adenomyosis varies between 20-30% and yet an exact number is difficult to assess due to the lack of standardized diagnostic criteria.

In 2022, the revised MUSA criteria were released to better diagnose and define the adenomyotic lesions.

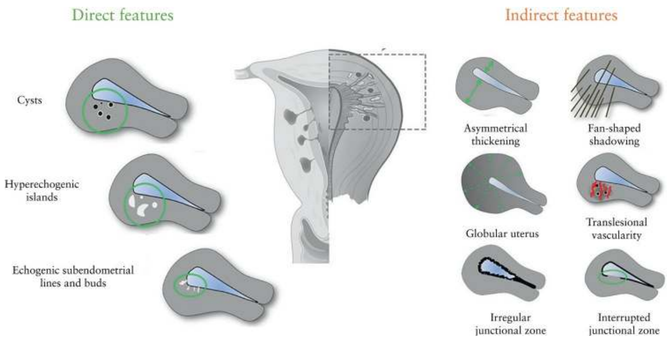
The diagnosis of adenomyosis is based on sonographic assessment of direct and indirect signs as shown in the figure (1).

Intra- as well as inter-observational discrepancies are highly likely and previous studies have described a variable reproducibility of the sonographic diagnostic criteria.

(1) Harmsen, M. J., Van den Bosch, T., de Leeuw, R. A., Dueholm, M., Exacoustos, C., Valentin, L., Hehenkamp, W. J. K., Groenman, F., De Bruyn, C., Rasmussen, C., Lazzeri, L., Jokubkiene, L., Jurkovic, D., Naftalin, J., Tellum, T., Bourne, T., Timmerman, D., & Huirne, J. A. F. (2022). Consensus on revised definitions of Morphological Uterus Sonographic Assessment (MUSA) features of adenomyosis: results of modified Delphi procedure. Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology, 60(1), 118–131. https://doi.org/10.1002/uog.24786

Materials and methods:

A review of stored ultrasound images of 2210 patients attending the clinic for infertility treatment was conducted by 2 REI specialists in a tertiary IVF referral centre. between 2017 and 2024.
The 2 physicians, blinded to the original diagnosis, reviewed the images and based on the revised MUSA criteria decided whether the patient had adenomyosis or not.
Statistical analysis using the Cohen Kappa test was then performed on the concordance rate.



Results:

The analysis revealed a fair agreement of kappa value of 0.261, 95% CI (0.203 - 0.331) in the diagnosis of adenomyosis. Sub-analysis of the direct signs of adenomyosis revealed “hyperechogenic islands” with the highest concordance rate with a kappa value of 0.271, 95% CI (0.201 - 0.344). Indirect signs of adenomyosis were also analyzed. The “asymmetrical thickening of the myometrium” had the highest agreement rate with a kappa value of 0.20, 95% CI (0.126 - 0.293).

Feature	Kappa	Interpretation
Adenomyosis	0.261	Fair
Hyperechogenic islands	0.271	Fair
Echogenic sub-endometrial lines/buds	0.156	Poor
Asymmetrical thickness myometrium	0.201	Fair
Globular uterus	0.04	Poor
Irregular junctional zone	0	Poor
Fan-shaped shadowing	0.057	Poor

Limitations:

The use of stored static images does not allow:

- Dynamic assessment
- Use of color doppler
- Use of 3D ultrasounds

Conclusion:

The findings of our study highlight the importance of using uniform diagnostic criteria for adenomyosis while performing advanced targeted ultrasounds to facilitate the diagnosis as well as the management of infertility in patients with adenomyosis.
Stored ultrasound images are not an accurate tool for the diagnosis of adenomyosis.

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