

Reproducibility of ultrasound features of Adenomyosis defined by revised MUSA criteria

An interobserver and intraobserver study.

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Objective – The aim of this study is to assess the inter and intra observer reproducibility of the identification of direct and indirect ultrasonographic features of Adenomyosis as defined by the revised Morphological Uterus Sonographic Assessment (MUSA) consensus (2022).

Methods –In this prospective observational study a cohort of 74 women, aged 18 to 45, were recruited from the recurrent miscarriage and general gynaecology clinic at a university-based fertility centre. All the participants underwent 2D and 3D transvaginal Ultrasound scan (TVS) examination in the late follicular and early luteal phase. Conventional grey scale and power Doppler image volumes were acquired and stored. Subsequently, the stored 3D ultrasound images were independently re-evaluated offline by the two observers for the direct and indirect features of Adenomyosis as outlined by the revised MUSA group. The intra and the inter-observer reproducibility was estimated using Cohen's Kappa coefficient

Conclusion - The reporting of Adenomyosis using direct features suggested by the revised MUSA group consensus showed only modest inter-observer and intra-observer agreement. The definitions of ultrasound features associated with adenomyosis require further refinement to enhance the reliability of the diagnostic criteria. Achieving a definitive diagnosis of adenomyosis through reliable and precise criteria is essential for facilitating appropriate management of affected patients, thereby leading to improved patient outcomes.

Results – The intra and inter-observer reproducibility (K -0.27, 95% CI 0.06-0.48 and K 0.13,95%CI -0.10 – 0.37 respectively) for at least one direct feature of adenomyosis was only modest. Amongst the individual direct features, the inter-observer variability of identifying myometrial cysts was fair (K 0.21, 95%CI -0.00 – 0.42) whereas the intra-observer variability was moderate (K 0.44, 95%CI 0.26 – 0.63). While hyperechogenic islands identification achieved fair level of intra (K 0.31, 95%CI 0.09-0.53) and inter-observer (K 0.24,95%CI 0.01-0.47) agreement, the reproducibility of reporting sub-endometrial lines/buds was fair for intra-observer (K 0.22 95%CI -0.02 0.47) and poor for inter-observer (K 0.00, -0.20 – 0.19). The inter-observer agreement for indirect features varied from poor to moderate while the intra-observer agreement ranged between poor to good.

	Characteristics	Inter-observer agreement (κ)	Level of agreement	Intra-observer agreement (κ)	Level of agreement
	Diagnosis of Adenomyosis	0.27	Fair	0.13	Poor
Direct features	Myometrial cysts	0.21	Fair	0.45	Moderate
	Hyperechogenic islands	0.24	Fair	0.32	Fair
	Sub-endometrial lines/buds	0.00	Poor	0.22	Fair
Indirect features	Globular Uterus	0.54	Moderate	0.64	Good
	Asymmetrical thickening	0.21	Fair	0.80	Very good
	Fan shaped shadowing	0.19	Poor	0.18	Poor
	Trans-lesional vascularity	0.39	Fair	0.36	Fair
	Irregular JZ	0.25	Fair	0.47	Moderate
	Interrupted JZ	0.31	Fair	0.38	Fair

References

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