

[EP04.I8] Diagnostic Accuracy of AI-driven Endometrial Receptivity Analysis (ERA) for Müllerian Anomalies in Routine Pelvic Scans

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Introduction:
Müllerian anomalies are a recognised cause of infertility. Accurate diagnosis often requires 3D reconstruction of the endometrial cavity in the coronal plane. AI-driven Endometrial Receptivity Analysis (ERA) in Mindray ultrasound system enables rapid automated reconstruction and contour recognition, potentially improving detection during routine pelvic scans.

Aims & Objectives:
The aim of this study was to evaluate the diagnostic capability of ERA in detecting common Müllerian anomalies.

Materials and Methods:
100 consecutive baseline scans prior to fertility treatment were performed using high-frequency transvaginal ultrasound (3- 11MHz) . Each case underwent gray scale and conventional 3D, followed by ERA in Mindray I9 Resona system. Automated cavity reconstruction and endometrial contour recognition were compared with conventional 2D/3D ultrasound, and findings correlated against hysteroscopy/MRI. A balanced dataset was created with 50 abnormal and 50 normal cases (excluding distorted cavities / gross adenomyosis). Diagnostic accuracy metrics were calculated.

Statistical Analytics:

Pathology	TP	FN	FP	TN	Sensitivity	Specificity	Accuracy
Partial Septate (17)	17	0	0	50	100%	100%	100%
Complete Septate (8)	4	4	0	50	50%	100%	85%
Dysmorphic (12)	12	0	0	50	100%	100%	100%
Hemiuterus (5)	5	0	0	50	100%	100%	100%
Complete Bicornuate (5)	0	5	0	50	0%	100%	90%
Partial Bicornuate (2)	2	0	0	50	100%	100%	100%
Bicornuate Septate (1)	1	0	0	50	100%	100%	100%
Overall (50+50)	41	9	0	50	82%	100%	91%

CONCLUSION:

AI-driven Endometrial Receptivity Analysis (ERA) enables routine ultrasound to serve as a triage tool for uterine morphological assessment, particularly for müllerian anomalies, in all uterine cavities with a clearly visible endometrial cavity lining on gray scale. ERA also provides an automated calculation of the residual cavity 3D volume. This ensures timely recognition and helps treatment decisions without reliance on advanced 3D expertise.
High accuracy is seen in detecting partial septate, dysmorphic, hemiuterus, and bicornuate variants. Limitations remain in complete septate and complete bicornuate anomalies where endometrial contour delineated is inadequate.

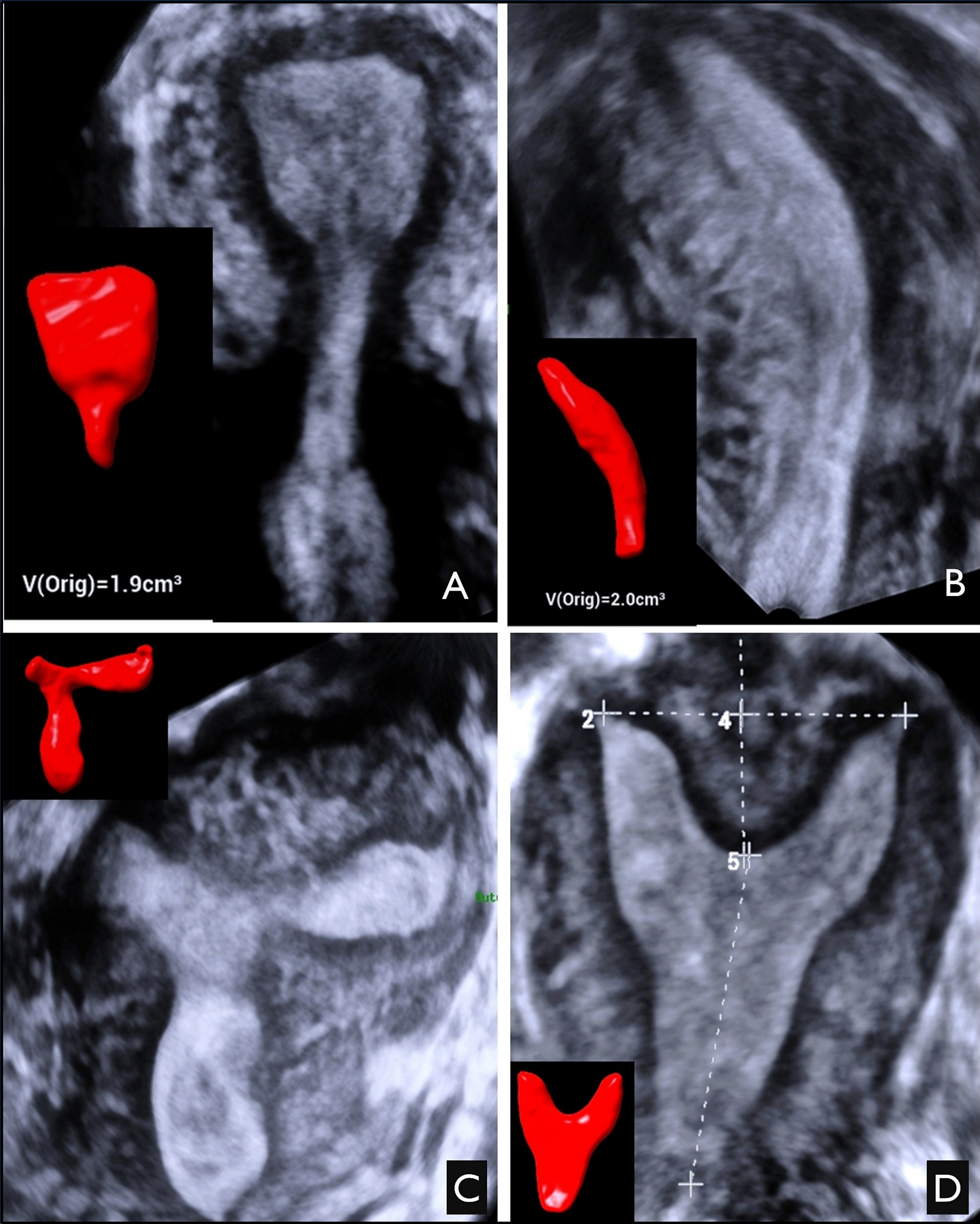


Figure 1: **Müllerian Anomalies detected by ERA:**
(A) Dysmorphic uterus; (B) Hemiuterus; (C) Complete septate uterus; (D) Partial septate uterus; (Inset in red –Automated volume analysis of the residual cavity)