

Proof-of-Concept Observational Study for the Development of a Severity Framework for the Y-Like §Dysmorphic Uterus Phenotype

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Objective

To compare our cohort of Y-shaped uteri, classified using a combination approach of 3D ultrasound and hysteroscopy, with the 19 3D ultrasound parameters provided by Gergolet et al. and to explore a pragmatic, norm-referenced framework for characterizing the Y-like dysmorphic uterus phenotype and its severity.

Methods

This is a retrospective, single-center proof-of-concept study. Fifty-one women with Y-shaped dysmorphic uterus and a history of negative reproductive outcomes who underwent combined hysteroscopic metroplasty targeting both the lateral walls and the fundus at Digital Hysteroscopic Clinic, Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome, Italy. Preoperative 3D ultrasound evaluation with extraction of 19 linear and angular 3D measurements defined by Gergolet et al. Values were standardized as z-scores relative to the reference population and oriented so that higher scores represented a more Y-shaped configuration. Correlated variables were grouped by anatomical meaning into five morphologic components (domains)—lateral configuration, fundal depth, indentation angle, transverse width, and mean lateral wall thickness—and combined into a single continuous index (Y-severity) using a weighted Stouffer method corrected for inter-domain correlation. Composite Y-severity score and distribution of four predefined severity classes (Extreme, Marked, Abnormal, and Within range) describing deviation from the reference uterus.

Results

Y-shaped uteri showed consistent deviations in lateral angles and fundal indentation. Median Y-severity was 2.15 [IQR 1.53–2.54]. Class distribution was 22% Extreme, 43% Marked, 23% Abnormal, and 12% Within range.

Conclusion

This study provides proof of concept for a quantitative and standardized 3D ultrasound score (Y-severity) that objectively describes the geometry of Y-shaped dysmorphic uterus and classifies its severity into clinically interpretable categories.

Figure 1. Preoperative hysteroscopic features of Y-shaped dysmorphic uterus and post-operative hysteroscopic vision of the uterine cavity.

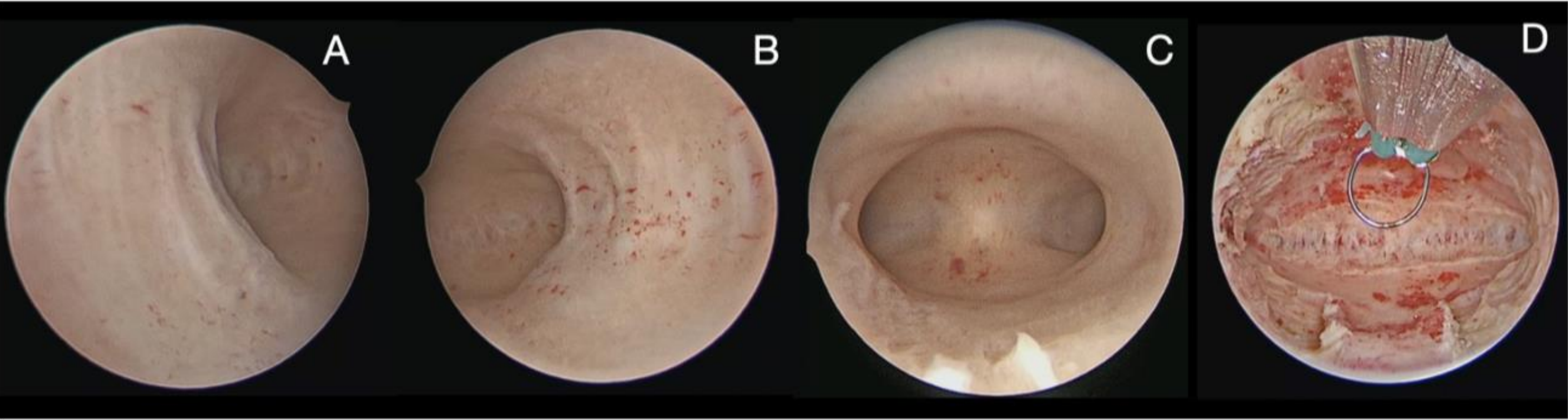


Figure 3. Percentile-based reference thresholds for key morphometric parameters associated with Y-shaped uterine morphology.

