

Fetal pelvic cystic lesions: an anatomy-based ultrasound approach for precise prenatal diagnosis

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Objective

To develop and present a structured, anatomy-based ultrasound approach for the evaluation of fetal pelvic cystic lesions, addressing their heterogeneous etiology and overlapping sonographic features.

Methods

A systematic, anatomy-based ultrasound approach was developed using integrated sonographic, clinical, prenatal, and postnatal data from fetal pelvic cystic lesions evaluated at a tertiary referral center. Key diagnostic steps were defined, incorporating dynamic real-time assessment into a practical framework.

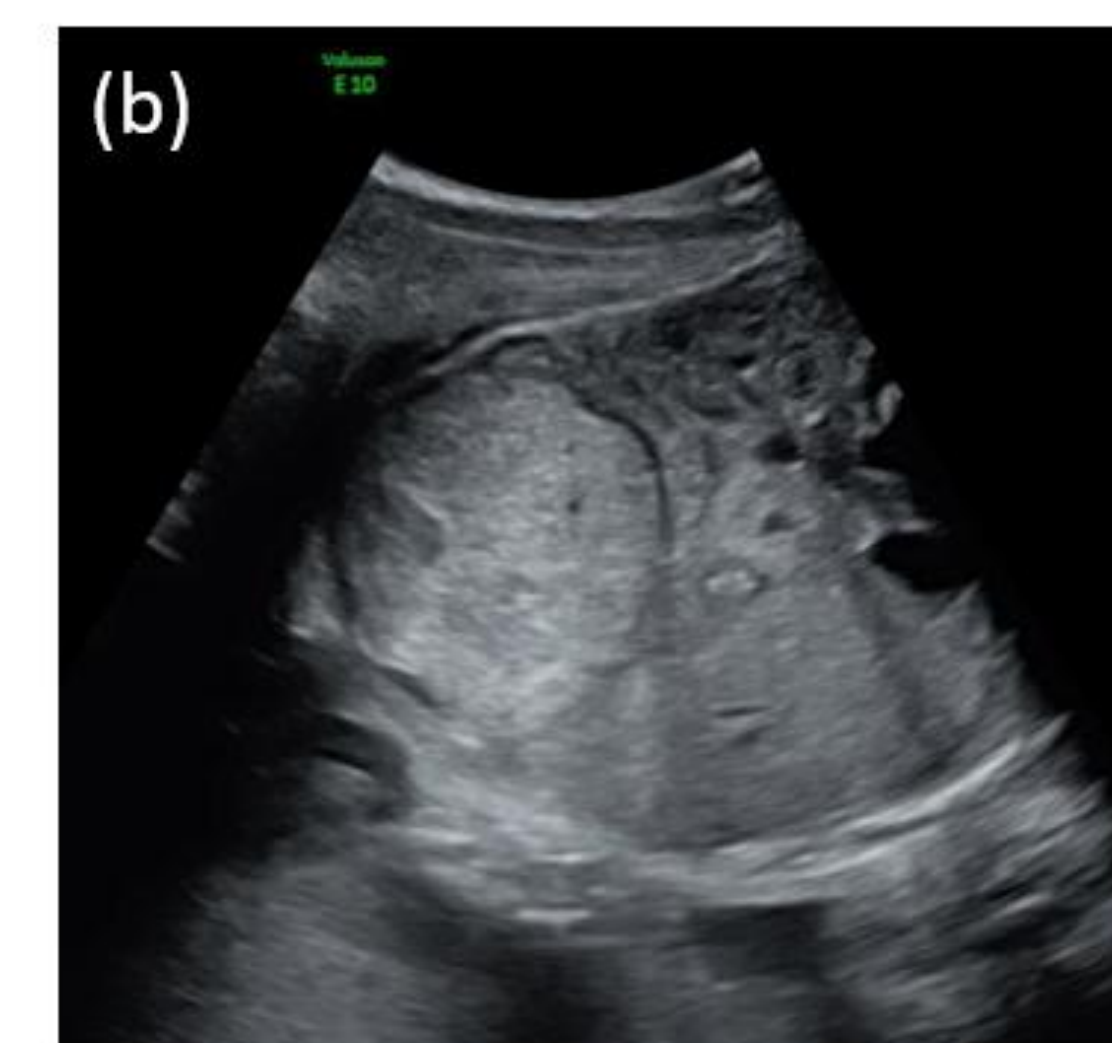
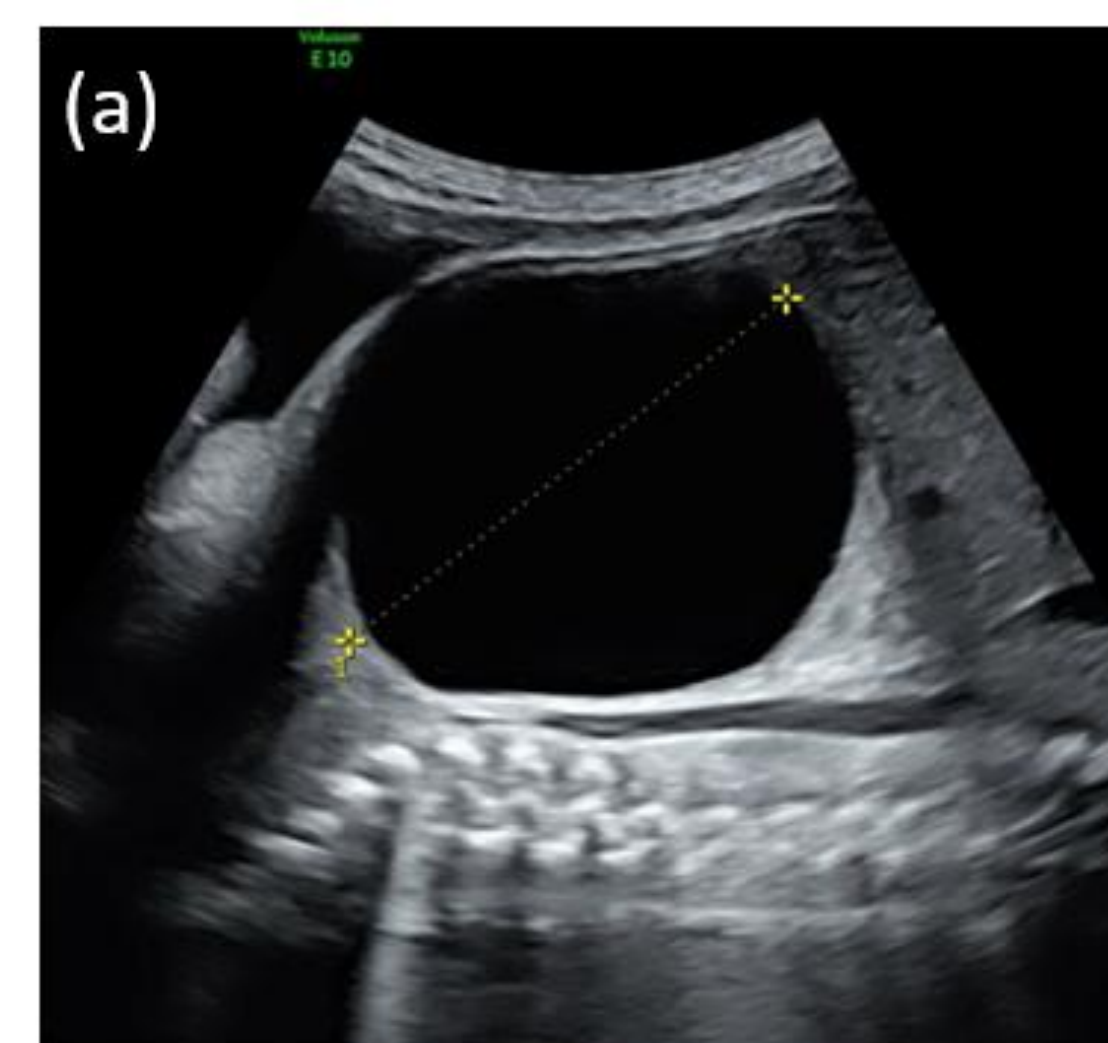
Results

The proposed approach enables a stepwise evaluation and classification of fetal pelvic cystic lesions, integrating 2-D and 3-D imaging with Doppler assessment. Dynamic, real-time evaluation of the bladder, urinary tract, and gastrointestinal system is integral to accurate characterization.

Key diagnostic steps include:

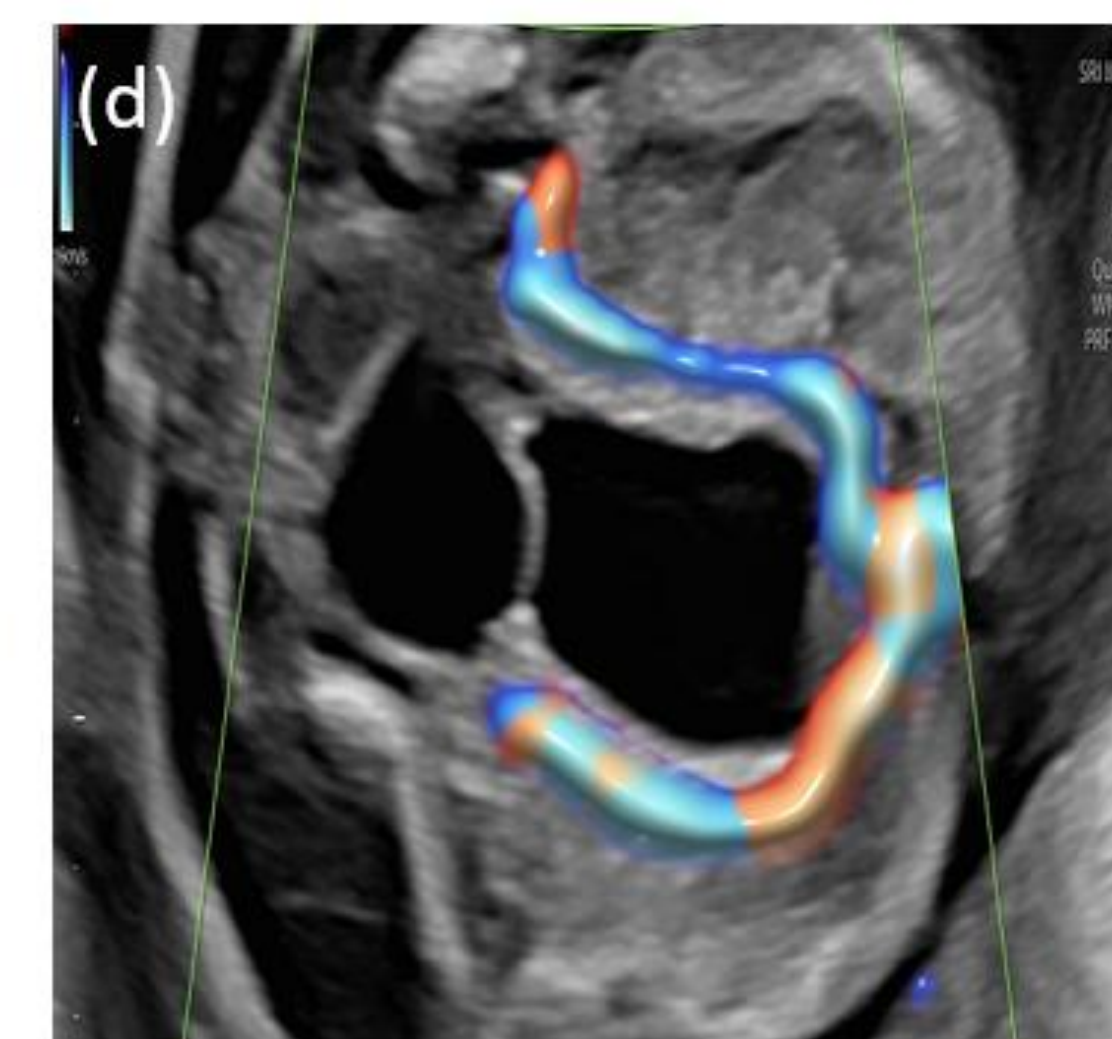
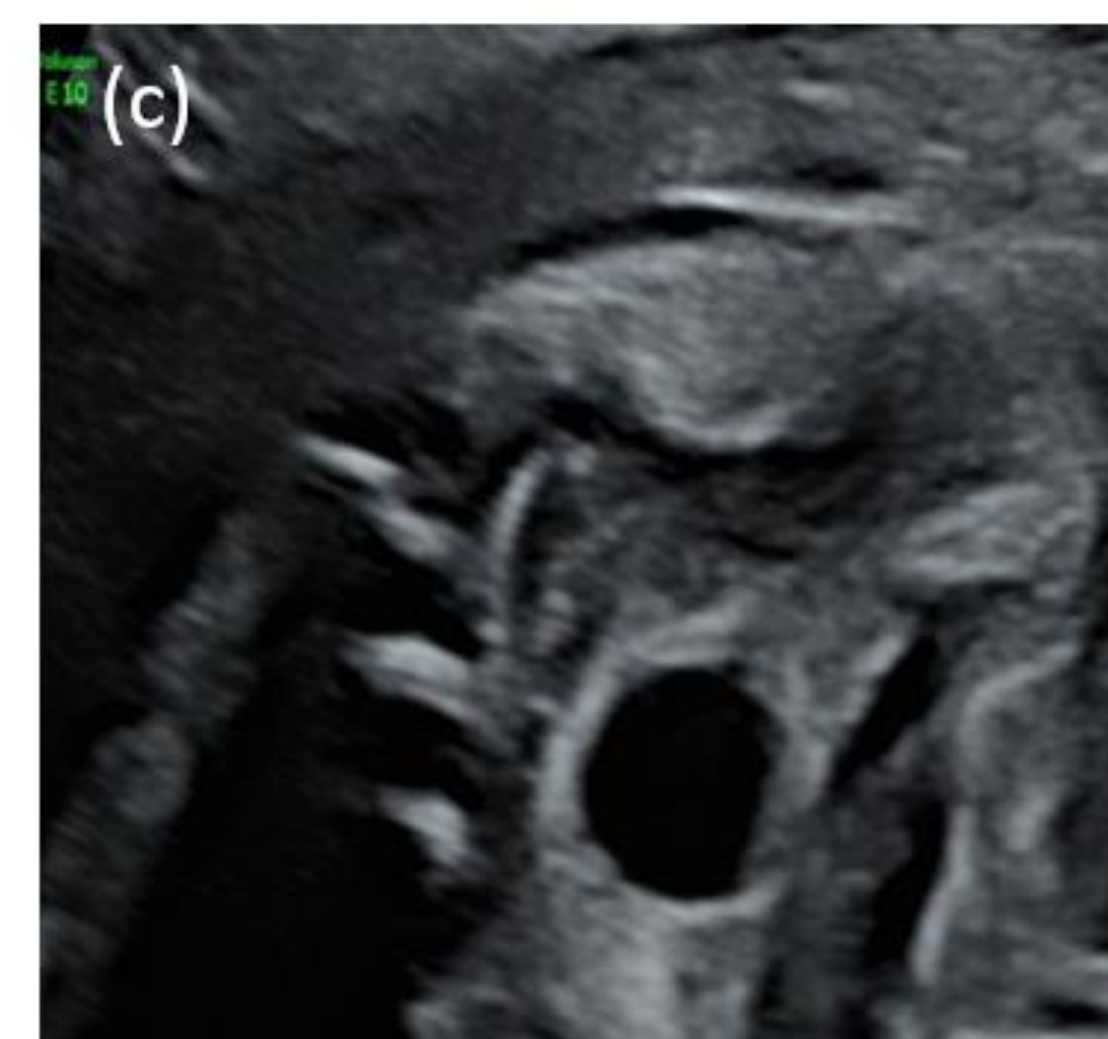
1. Determination of fetal sex
2. Localization of the lesion relative to the bladder: lateral – ovarian origin; posterior – genital tract obstruction; anterior – genitourinary origin; superior – gastrointestinal/small bowel origin
3. Targeted assessment of the kidneys, anal canal (target sign), and uterus to refine the differential diagnosis
4. Morphologic characterization of the cyst: gut signature supporting enteric duplication cyst; intra-abdominal calcifications favoring meconium pseudocyst; multiloculated or vascular lesions suggesting lymphatic malformations or neoplastic processes

This structured approach facilitates narrowing of the differential diagnosis based on anatomical origin and associated findings.



(a) Sagittal view of the fetal pelvis at 30 + 5 weeks' gestation demonstrating a well-defined, anechoic, thin-walled cyst, consistent with a simple ovarian cyst.

(b) Sagittal view of the fetal pelvis at 31 + 5 weeks' gestation showing interval progression to a complex ovarian cyst with heterogeneous internal echogenicity, suggestive of ovarian torsion.



(c) Anterior perineal view of the fetal pelvis demonstrating hydrometrocolpos. Associated findings included a unilateral dysplastic kidney with a contralateral normal kidney, consistent with obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) syndrome.

(e) Axial grayscale and color Doppler ultrasound image of the fetal pelvis demonstrating two adjacent cystic structures: a dorsal ureterocele and a ventral urinary bladder, with the umbilical arteries encircling the bladder.

Conclusion

An anatomy-based ultrasound approach provides a systematic, reproducible framework for evaluating fetal pelvic cystic lesions. This structured method enhances diagnostic accuracy, supports precise differential diagnosis, and improves consistency in prenatal assessment, thereby facilitating targeted counseling, optimized surveillance, and multidisciplinary perinatal management.