



Clinical Image

Three-Dimensional Ultrasound Appearance of an Apparently Small Testis with a Prominent Epididymis

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Abstract

Three-dimensional (3D) ultrasound may complement conventional scrotal imaging by displaying the testis and epididymis within a single reconstructed volume. We present a volume-rendered 3D ultrasound image obtained during the infertility evaluation of an adult male. Scrotal imaging was performed using a Samsung Medison ultrasound system with an LV3-14A linear transducer. Following standard two-dimensional assessment, a volumetric dataset was acquired and reconstructed using multiplanar and volume-rendering modes. The image demonstrated an apparently small ovoid testis with a disproportionately prominent, elongated epididymis along its posterior aspect. This appearance provided an intuitive representation of the size discordance and anatomical relationship between the two structures. However, the finding is descriptive rather than diagnostic because quantitative measurements and Doppler information were not available. Interpretation should therefore be correlated with grayscale and color Doppler imaging, clinical history, semen analysis, and hormonal evaluation. Further studies are needed to determine whether quantitative 3D measurements improve male infertility assessment.

Introduction

We present a volume-rendered three-dimensional (3D) ultrasound image obtained during the evaluation of an adult male with infertility. The image demonstrates an apparently small testis with a disproportionately prominent epididymis. Conventional scrotal ultrasound remains the primary imaging method for assessing testicular size, echotexture, vascularity, and associated epididymal abnormalities [1–3]. Three-dimensional visualization may complement standard two-dimensional imaging by displaying the overall configuration of the testis and epididymis within a single reconstructed volume.

Materials and methods

Scrotal imaging was performed using a Samsung Medison ultrasound system and an LV3-14A linear transducer. The probe was applied externally with generous coupling gel and minimal pressure. Following conventional two-dimensional assessment, a volumetric dataset was acquired using the

system's 3D volume acquisition function and reconstructed using multiplanar and volumerendering modes. The reconstructed image was reviewed to assess the relative size and spatial relationship of the testis and epididymis.

An adult male undergoing evaluation for infertility underwent scrotal ultrasonography. Following conventional two-dimensional assessment, a volumetric ultrasound dataset was acquired for three-dimensional reconstruction. The reconstructed volume demonstrated an apparently small ovoid testis with a disproportionately prominent and elongated epididymis along its posterior aspect.

The volume-rendered image shows an apparently small ovoid testis and a disproportionately prominent, elongated epididymis extending along its posterior aspect. The size discrepancy makes the epididymal contour and its relationship to the testis readily appreciable. Because the image does not provide quantitative measurements or Doppler information, the finding should be interpreted together with standard

grayscale and color Doppler imaging, clinical history, semen analysis, and endocrine evaluation [3,5].

Perspective

Clinical significance and interpretation

Reduced testicular volume has been described in association with impaired testicular development, and epididymal enlargement or prominence has been reported in obstructive and inflammatory conditions of the epididymis [2,3,6]. However, testicular volume alone is not a reliable discriminator between obstructive and non-obstructive etiologies, and epididymal prominence on a volume-rendered image does not equate to confirmed obstruction. These appearances are therefore descriptive rather than diagnostic and should be correlated with clinical history, semen analysis, serum hormonal evaluation, and conventional grayscale and color Doppler imaging [1,3,5]. The principal value of this clinical image lies in its intuitive 3D depiction of the size discordance and the anatomical relationship between the epididymis and testis, which may prompt further targeted evaluation rather than support a specific etiological conclusion. Further studies should determine whether quantitative 3D measurements of testicular and epididymal volume are reproducible and add diagnostic value beyond conventional two-dimensional ultrasound [1,3,5] (Figure 1).

Author contributions

Conceptualization, S.K. and R.G.; methodology, R.G.; software, S.K.; validation, R.G.; investigation, S.K.; writing—original draft preparation, S.K. and R.G.; writing—review and editing, S.K.; all authors have read and agreed to the published version of the manuscript. Funding: This research received no external funding.

Institutional review board statement

The study was approved by the Institutional Ethics Committee for Research on Human Volunteers, Krishna IVF Clinic, Visakhapatnam, India (Approval No. KIVF/001/MG/122013; approved on 5 December 2013).

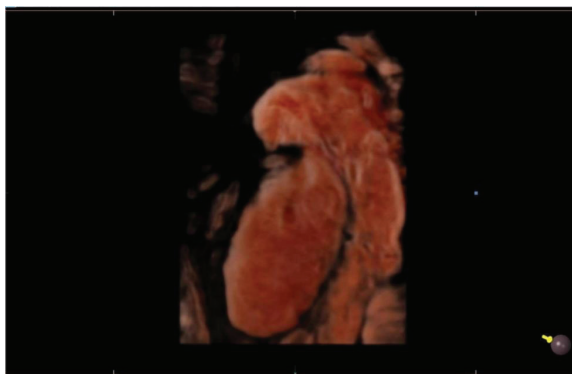


Figure 1: Volume-rendered three-dimensional ultrasound image showing an apparently small ovoid testis and a disproportionately prominent, elongated epididymis along its posterior aspect. The appearance is descriptive and should be correlated with quantitative measurements, conventional grayscale imaging, color Doppler findings, semen analysis, and hormonal assessment.

Informed consent statement

Written informed consent for publication of the clinical information and image was obtained from the participant.

Conflicts of interest

Srinivas Kudavelly is an employee of Cyient Limited. Cyient Limited contributed technical and knowledge-based collaboration to this work but provided no financial support, equipment, or material resources and had no role in patient recruitment, clinical care, image acquisition, or clinical decision-making. The authors declare no other competing interests.

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