

Interesting Images

Not peer-reviewed version

Role of Epididymis Assessment in Male Infertility Using Three-Dimensional Ultrasound Visualization

[Srinivas Kudavelly](#)^{*} and [Rama Raju GA](#)

Posted Date: 2 February 2026

doi: 10.20944/preprints202602.0101.v1

Keywords: scrotal ultrasound; three-dimensional ultrasound; epididymis; male infertility; volume rendering



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a [Creative Commons CC BY 4.0 license](#), which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Interesting Images

Role of Epididymis Assessment in Male Infertility Using Three-Dimensional Ultrasound Visualization

Srinivas Kudavelly ^{1,*} and Rama Raju GA ²

¹ Technology Group, Cyient Limited, Bangalore, Karnataka, India

² Krishna IVF Clinic, Visakhapatnam, Andhra Pradesh

* Correspondence: srinivas.kudavelly@gmail.com

Abstract

We present a clinical image demonstrating external scrotal use of a conventional three-dimensional (3D) transvaginal ultrasound probe in an adult male undergoing infertility evaluation. Volumetric acquisition with multiplanar reconstruction and volume rendering provided intuitive depiction of epididymal configuration relative to the testis, complementing standard two-dimensional scrotal ultrasound.

Keywords: scrotal ultrasound; three-dimensional ultrasound; epididymis; male infertility; volume rendering

1. Introduction

We present a clinical image demonstrating a novel external scrotal application of a conventional three-dimensional (3D) transvaginal ultrasound probe. The images were obtained in an adult male undergoing infertility evaluation [1]. With generous coupling gel and minimal probe pressure, the transvaginal probe was applied externally over the scrotum. High-resolution 2D images were first obtained, followed by volumetric 3D acquisition. The acquired dataset was analyzed using multiplanar reconstruction and volume-rendering techniques.

2. Materials and Methods

Conventional 2D scrotal ultrasound is effective for evaluation of scrotal pathology [2], but depiction of complex epididymal morphology and its spatial relationship to the testis may be limited in some cases. Three-dimensional scrotal ultrasound enables multiplanar review of a volumetric dataset and can provide additional anatomic visualization through volume rendering [4]. Three-dimensional extended imaging (3D XI) allows an acquired volume to be displayed using different viewing modes. Multi-slice view (MSV) presents the dataset as sequential 2D slices to facilitate systematic review in multiple planes [4].

Imaging was performed on a Samsung Medison WS80A ultrasound system using CrystalVue 3D volume-rendering technology. A 3–14 MHz 3D transducer was applied externally with generous coupling gel and minimal pressure to obtain the volumetric acquisition and subsequent reconstructions [4].

3. Perspectives

This technique provides an intuitive three-dimensional depiction of epididymal configuration and its relationship to the testis, which may complement standard 2D scrotal ultrasound in selected infertility evaluations [1,3]. Potential applications include improved anatomic documentation when epididymal obstruction is suspected and reproducible follow-up comparisons over time. The incremental value, reproducibility, examination time, and impact on clinical decision-making should be evaluated in prospective studies [5].

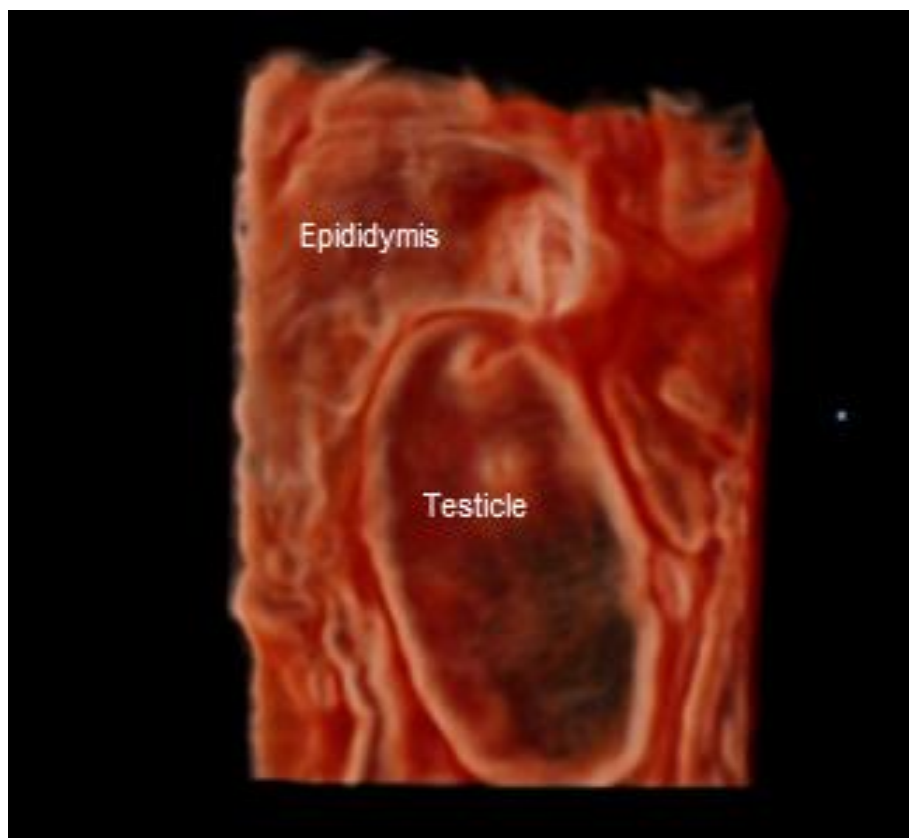


Figure 1. Representative multiplanar reconstruction demonstrating the relationship of the epididymis to the adjacent testis.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org, Figure S1: title; Table S1: title; Video S1: title.

Author Contributions: Conceptualization, S.K. and R.G.; methodology, R.G.; software, S.K.; validation, R.G., investigation, R.G.; writing—original draft preparation, S.K.; 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 did not require ethical approval.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Edey, A.J.; Sidhu, P.S. Male infertility: role of imaging in the diagnosis and management. *Imaging* 2008, 20, 139–146.
2. Mirochnik, B.; Bhargava, P.; Dighe, M.K.; Kanth, N. Ultrasound evaluation of scrotal pathology. *Radiol Clin North Am.* 2012, 50, 317–332.

3. Practice Committee of the American Society for Reproductive Medicine; Society for Male Reproduction and Urology. The management of obstructive azoospermia: a committee opinion. *Fertil Steril*. 2019, 111, 873–880.
4. Sidhu, P.S.; Yusuf, G.T.; Sellars, M.E.; Deganello, A.; Fang, C.; Huang, D.Y.H. A review of multiparametric ultrasound imaging in the clinical setting: scrotal contents. *Abdom Radiol*. 2025, 50, 1363–1375.
Li, X.; Yao, C.-C.; Zhang, C.-W.; Wang, X.-B.; Jiang, L.-R.; Li, Z.; Li, P.; Wu, R. Localization of obstruction sites in obstructive azoospermia: role of combined transscrotal–transrectal ultrasonography. *Insights Imaging* 2025, 16, 269.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.