Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Limits of Conventional Imaging in Bilateral Non-Palpable Cryptorchidism: A Multidisciplinary Perspective

Dek Hassan[1*], A. Outrah[1], B. Slioui[1], R. Roukhesi[1], S. Bellasri[1], Ben Elhend[1], N. Hammoune[1], A. Mouhsine[1]

[1]Department of Radiology, Avicenne Military Hospital, Mohamed VI University Hospital, Marrakech, Morocco

DOI: https://doi.org/10.36347/sjmcr.2025.v13i09.055 | **Received:** 12.07.2025 | **Accepted:** 30.08.2025 | **Published:** 30.09.2025

***Corresponding author:** Dek Hassan
Department of Radiology, Avicenne Military Hospital, Mohamed VI University Hospital, Marrakech, Morocco

Abstract **Case Report**

Bilateral non-palpable cryptorchidism is a rare yet clinically significant entity associated with infertility, malignancy, and disorders of sexual development. We report the case of a 5-year-old boy with bilaterally empty scrotal sacs in whom both ultrasonography and contrast-enhanced CT failed to identify testicular tissue. This case illustrates the limitations of conventional morphological imaging and underscores the crucial role of MRI, endocrine assessment including anti-Müllerian hormone (AMH), inhibin B/FSH ratios, and emerging markers such as INSL3 and diagnostic laparoscopy. A multidisciplinary strategy involving radiology, endocrinology, and pediatric urology remains indispensable for accurate diagnosis and timely management.

Keywords: Cryptorchidism, Bilateral non-palpable testes, Imaging limitations, Pediatrics, MRI, Endocrine markers.

INTRODUCTION

Cryptorchidism is the most common congenital anomaly of the male genital tract, affecting 2–4% of full-term and up to 30% of premature newborns [1]. While most cases are unilateral and clinically palpable, about 20% involve non-palpable testes [2]. Bilateral non-palpable presentation is exceptional, accounting for fewer than 10% of cases, and poses substantial diagnostic and therapeutic challenges [3].

The key differential diagnoses include intra-abdominal undescended testes, testicular regression syndrome, and the exceedingly rare bilateral testicular agenesis. Precise differentiation is essential, as each carries different implications for fertility potential, malignancy risk, and possible disorders of sexual development (DSDs).

CASE PRESENTATION

A 5-year-old boy was referred for evaluation of bilaterally absent testes. Physical examination confirmed empty scrotal sacs with no palpable gonads along the inguinal canals or abdomen.

Ultrasound: High-frequency scrotal and inguinal ultrasonography failed to visualize any testicular tissue.

CT scan: A pediatric contrast-enhanced abdominopelvic CT, performed with appropriate dose adaptation, showed no evidence of testicular structures in the scrotum, inguinal canal, or abdomen (Figure 1). The pelvic and retroperitoneal anatomy was unremarkable, with normal kidneys, adrenal glands, and other abdominal viscera. No masses, fibrous remnants, lymphadenopathy, or peritoneal effusion were noted.

Magnetic resonance imaging (MRI), the most sensitive modality for detecting intra-abdominal testes, could not be performed due to resource constraints.

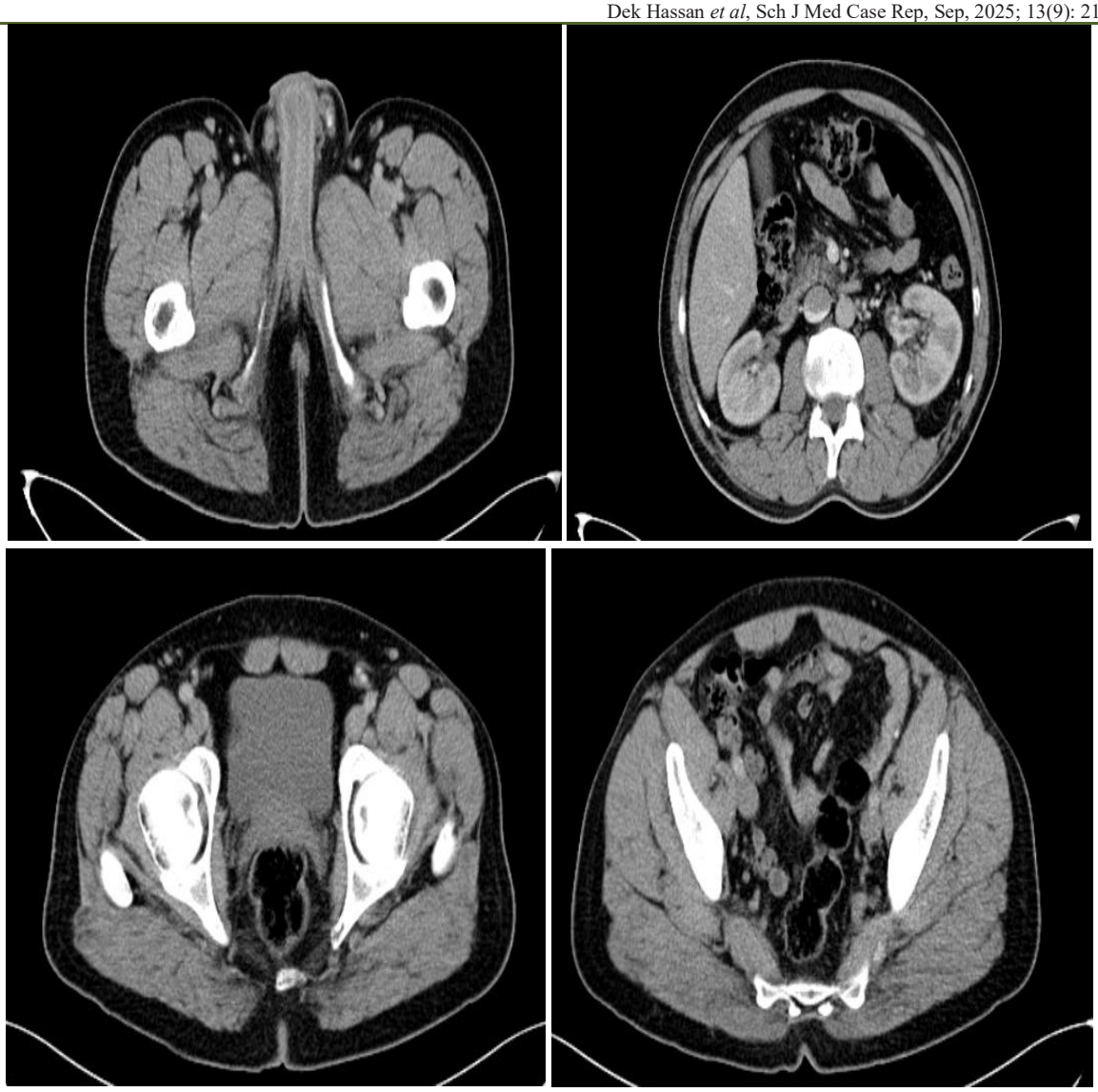

Figure 1: Axial contrast-enhanced CT scan showing absence of testicular tissue in scrotal, inguinal, and abdominal regions. Pelvic and retroperitoneal anatomy is otherwise normal

DISCUSSION

Clinical implications

Although rare, bilateral non-palpable cryptorchidism carries important clinical consequences. Beyond infertility, these patients face increased risk of germ cell tumors and possible DSDs [3]. Early and accurate diagnosis is therefore essential.

Imaging limitations

- **Ultrasound:** First-line but limited in sensitivity for intra-abdominal testes, especially in older children [4].
- **CT scan:** Provides excellent anatomic detail but exposes children to radiation and remains insensitive for atrophic or hypoplastic testes [5].
- **MRI:** Recent analyses confirm MRI as the most reliable imaging modality for localizing non-palpable testes. Krishnaswami *et al.,* demonstrated its superiority over ultrasound and CT in sensitivity and specificity [6]. A 2018 meta-analysis similarly confirmed that MRI can detect testes as small as 5 mm in retrovesical or high pelvic locations [7].

Endocrine evaluation

When imaging is inconclusive, endocrine markers are indispensable. Serum AMH is a reliable indicator of testicular tissue from fetal life to mid-puberty [8]. Walczak-Jędrzejowska *et al.,* (2025) highlighted that elevated FSH, reduced inhibin B/FSH ratios, and altered levels of DHT and INSL3 provide strong evidence of Sertoli and Leydig cell dysfunction in cryptorchid boys [9]. These findings support AMH and INSL3 as key non-invasive biomarkers, especially in suspected agenesis.

Diagnostic hypotheses

In this case, two main possibilities were considered:

1. **Testicular regression syndrome (vanishing testes):** Typically due to prenatal torsion, leaving fibrous remnants.

2. **True bilateral testicular agenesis:** Exceedingly rare, estimated at 1 in 20,000–100,000 live births [10].

Role of laparoscopy and multidisciplinary care

Diagnostic laparoscopy remains the gold standard when imaging and hormonal evaluation are inconclusive. It permits direct visualization, confirmation of regression remnants, or orchidopexy when viable tissue is present. Current guidelines (AUA, EAU, ESPU) emphasize the need for a multidisciplinary approach, combining pediatric radiology, endocrinology, and pediatric surgery [11].

CONCLUSION

This case demonstrates the diagnostic limitations of conventional imaging in bilateral non-palpable cryptorchidism. While ultrasound and CT may exclude associated anomalies, they often fail to detect small or atrophic gonads. MRI, combined with serum markers such as AMH and INSL3, provides superior diagnostic value. Ultimately, diagnostic laparoscopy remains the most definitive tool. Early multidisciplinary collaboration is crucial to optimize outcomes in these rare but clinically significant cases.

REFERENCES

1. Hutson JM, Thorup J, Beasley SW. *Descent of the Testis.* Springer; 2016.
2. Kolon TF, Herndon CD, Baker LA, *et al.,* Evaluation and treatment of cryptorchidism: AUA guideline. *J Urol.* 2014;192(2):337–345.
3. Wood HM, Elder JS. Cryptorchidism and testicular cancer: separating fact from fiction. *J Urol.* 2009;181(2):452–461.
4. Elder JS. Ultrasonography is unnecessary in evaluating boys with a nonpalpable testis. *Pediatrics.* 2002;110(4):748–751.
5. Docimo SG. The results of surgical therapy for cryptorchidism: a literature review and analysis. *J Urol.* 1995;154(3):1148–1152.
6. Krishnaswami S, Fonnesbeck C, Penson D, *et al.,* Magnetic resonance imaging for nonpalpable cryptorchidism: a systematic review and meta-analysis. *J Urol.* 2013;190(2):662–667.
7. Wang Y, *et al.,* Magnetic resonance imaging for nonpalpable undescended testis: meta-analysis. *World J Urol.* 2018;36(7):1175–1183.
8. Virtanen HE, *et al.,* Anti-Müllerian hormone as a diagnostic marker in boys with non-palpable gonads. *Front Endocrinol.* 2024; 15:1435877.
9. Walczak-Jędrzejowska R, *et al.,* Hormonal evaluation of prepubertal boys with cryptorchidism prior to orchidopexy. *J Clin Med.* 2025;14(1):73.
10. Grinspon RP, Rey RA. Regulation of fetal Leydig cell development by activin A and inhibin B. *Mol Cell Endocrinol.* 2014;382(1):460–467.
11. Medscape. Cryptorchidism Workup. Updated 2023. Available at: https://emedicine.medscape.com/article/1017420-workup