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Case Insight

Crossed Testicular Ectopia in a Three-Year-Old: Case Report and Literature Review

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Abstract

Crossed testicular ectopia (CTE) is a rare congenital anomaly in which both testes descend toward the same hemiscrotum, with fewer than 150 cases reported in the literature. We present the case of a three-year-old boy who was admitted with swelling in the left inguinal region and bilaterally empty scrotum. Ultrasonography revealed one testis in the left inguinal canal and absence of the right testis. During inguinal exploration, both testes were found on the left side, confirming CTE. Each testis demonstrated normal morphology, vascularity, and adequate cord length, allowing successful left subdartos orchiopexy and right transseptal orchiopexy. The postoperative course was smooth, and follow-up confirmed proper placement of both testes in their respective scrotal compartments. This case emphasizes the importance of considering CTE in children with unilateral inguinal hernia and contralateral non-palpable testis and highlights the role of timely surgical intervention in preserving fertility and reducing malignancy risk.

Keywords Crossed testicular ectopia · Transverse testicular ectopia · Inguinal hernia · Orchiopexy · Pediatric urology

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Introduction

Crossed testicular ectopia (CTE), also known as transverse testicular ectopia, is an exceptionally rare congenital anomaly in which both testes descend toward the same hemiscrotum. The condition was first described by Von Lenhossek in 1886, and since then, fewer than 150 cases have been reported worldwide, underscoring its rarity (Abdelmohsen et al., 2018, Balaswad et al., 2023). Several alternative terminologies, such as testicular pseudo-duplication and unilateral double testis, have also been used in the literature to describe this anomaly (Orfi et al., 2016). The exact etiology remains unclear, but proposed mechanisms include abnormal gubernacular development, early fusion of the Wolffian ducts, or adherence during embryogenesis that causes one testis to follow the other during descent.

Clinically, CTE is most often discovered in association with inguinal hernia and contralateral cryptorchidism. Preoperative diagnosis may occasionally be achieved through ultrasonography or magnetic resonance imaging, though many cases are diagnosed incidentally during surgical exploration for hernia repair. Classification of CTE is based on associated anomalies: type I with inguinal hernia alone, type II with persistent Müllerian duct remnants, and type III with other genitourinary anomalies (Balaswad et al., 2023). Management is primarily surgical, with transseptal orchiopexy being the treatment of choice if adequate cord length is available, while orchiectomy is reserved for atrophic or immobile testes. Here, we present a rare case of crossed testicular ectopia in a three-year-old boy and provide a brief review of the literature to highlight the diagnostic and therapeutic challenges of this uncommon condition.

Case Presentation

A three-year-old boy was presented by his mother to the urology outpatient clinic with a complaint of swelling in the left inguinal region that had been gradually noticed over the past several weeks. The swelling increased in size when the child was active or crying and reduced spontaneously at rest, suggesting an inguinal hernia. On clinical examination, the scrotum was bilaterally empty, with no palpable testes in either hemiscrotum. A reducible left inguinal swelling was confirmed, and no abnormalities were detected on systemic examination. The child had no history of trauma, urinary symptoms, or prior surgery, and his developmental milestones were normal. There was no relevant family history of urogenital anomalies, and the patient was otherwise healthy.

Ultrasonographic evaluation of the inguinoscrotal region was subsequently performed. The imaging revealed the absence of a testis in the expected position on the right side, while one testis was visualized in the left inguinal canal in association with a hernia sac. The contralateral testis was not identified. No Müllerian remnants or other genitourinary abnormalities were observed. Based on these findings, the initial impression was left inguinal hernia with bilateral undescended testis. The surgical plan was to proceed with diagnostic laparoscopy to localize the non-palpable right testis and to repair the left inguinal hernia. However, due to technical limitations, the operation was initiated with a left inguinal exploration.

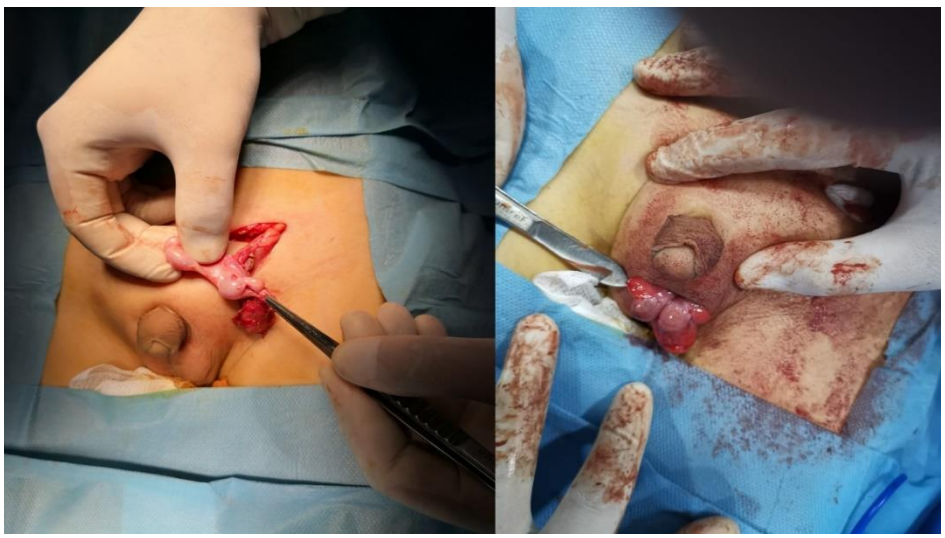

Figure 1: Intraoperative photographs showing both testes located in the left inguinal canal during surgical exploration and mobilization prior to orchiopexy.

During exploration, both testes were unexpectedly discovered within the left inguinal canal, confirming the diagnosis of crossed testicular ectopia (*Figure 1*). Each testis demonstrated normal morphology, satisfactory vascularity, and adequate cord length, making them suitable for preservation (*Figure 2*). Surgical management consisted of performing a left subdartos orchiopexy to fix the ipsilateral testis in the left hemiscrotum, followed by a right transseptal orchiopexy in which the contralateral testis was tunneled across the scrotal septum into the right hemiscrotum. Both testes were secured in their anatomically appropriate positions without tension. The postoperative course was uneventful, with the patient recovering smoothly and being discharged home within 48 hours. At follow-up, both testes were palpable in their respective hemiscrota, with no recurrence of hernia or evidence of complications.

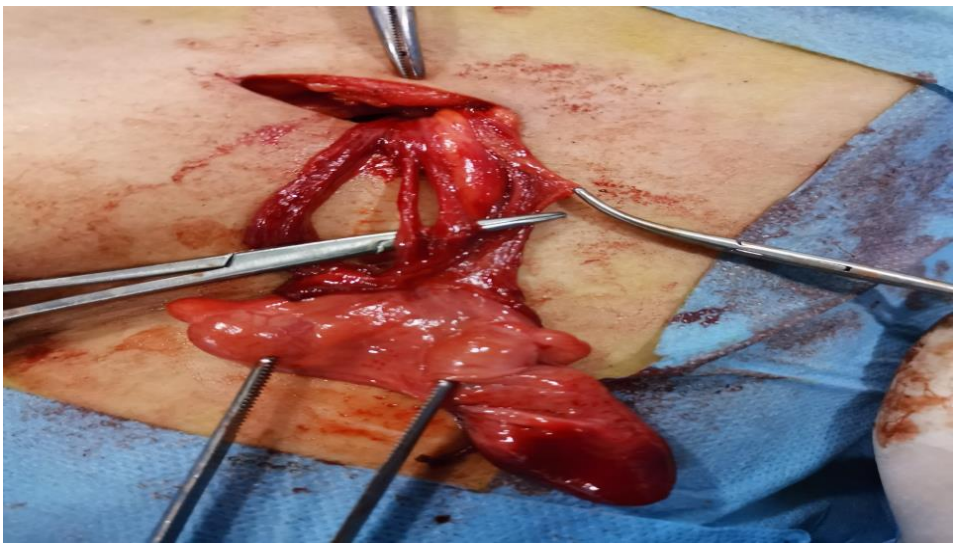

Figure 2: Intraoperative image showing both testes with adequate cord length and vascularity identified in the left inguinal canal during mobilization prior to orchiopexy.

Discussion

CTE is a rare congenital anomaly characterized by migration of both testes toward the same hemiscrotum. Since it was first described by Von Lenhossek in 1886, fewer than 150 cases have been reported worldwide, making it an exceptionally uncommon condition (Balaswad et al., 2023, Mjali et al., 2019). The exact etiology remains uncertain, though several embryological theories have been proposed. These include early adherence and fusion of the Wolffian ducts, abnormal development of the gubernaculum, or a mechanism in which one testis drags the other across during its descent. Despite these hypotheses, no single explanation fully accounts for all cases, and the pathogenesis of CTE remains incompletely understood.

Most cases of CTE are diagnosed in early childhood, typically presenting with ipsilateral inguinal hernia and contralateral cryptorchidism, as seen in our patient. Although imaging modalities such as ultrasonography and MRI can sometimes identify the anomaly preoperatively, CTE is most often diagnosed incidentally during surgical exploration for inguinal hernia repair (Orfi et al., 2016). In our case, the initial preoperative suspicion was left inguinal hernia with bilateral non-palpable testis, but intraoperative findings confirmed the presence of both testes within the left inguinal canal. This highlights the diagnostic challenge of CTE and underscores the importance of maintaining a high index of suspicion when evaluating children with unilateral hernia and non-palpable contralateral testis.

A classification system proposed by Gauderer et al. (1982) divides CTE into three types: type I (associated only with inguinal hernia, accounting for 40–50% of cases), type II (associated with persistent or rudimentary Müllerian duct structures, ~30% of cases), and type III (associated with other genitourinary anomalies, ~20% of

cases). Based on this classification, our patient represents type I, which is the most common form. Importantly, although our case was not associated with Müllerian remnants or urinary tract abnormalities, careful intraoperative inspection and follow-up remain essential, as additional anomalies have been described in the literature (Balaswad et al., 2023). Karyotyping may be warranted in ambiguous cases, especially if associated genital anomalies are present.

The treatment goal in CTE is to preserve fertility potential and reduce the long-term risk of malignancy. Transseptal orchiopexy remains the most widely accepted procedure when cord length is sufficient, as it allows both testes to be positioned in their appropriate hemiscrota with minimal tension (Beaud et al., 2021). Alternative techniques, such as extraperitoneal transposition orchiopexy, may be considered depending on anatomy, while orchiectomy is reserved for atrophic or nonviable testes. In our patient, both testes were of normal size, vascularity, and cord length, making bilateral orchiopexy the optimal approach. Postoperative recovery was uneventful, and both testes remained well-positioned at follow-up. This favorable outcome reinforces the importance of early diagnosis and timely surgical intervention in preventing infertility and malignancy risks associated with undescended testes.

Conclusion

This case highlights the importance of considering CTE in children presenting with unilateral inguinal hernia and contralateral non-palpable testis. Early surgical intervention with orchiopexy can achieve excellent outcomes, preserving fertility potential and reducing long-term risks.

Statements and Declarations

Funding information None.

Conflict of Interest Statement The authors declare no conflict of interest.

Ethics Statement Ethical approval was not required.

Patient consent statement Informed verbal consent was obtained from the patient for publication of this case and any accompanying images.

Clinical trial registration This study did not constitute a clinical trial and therefore did not require registration.

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Author Contributions Yadgar Abduljabbar Shwani: Conceptualization; data curation; methodology; writing—original draft; Visualization; writing—review & editing; Supervision.

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