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Case Report

CT Urography in the Diagnosis of Pelvic Fracture Urethral Injury: A Case Report

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Abstract

We report a case of pelvic fracture urethral injury (PFUI) in a 56-year-old man following a road traffic accident. The patient presented with pubic pain and scrotal swelling, and CT urography revealed urethral contrast extravasation and a 5 cm pubic diastasis. PFUI, often associated with high-velocity trauma and pelvic ring disruption, can present with subtle symptoms or be asymptomatic. While retrograde urethrography is the gold standard for diagnosis, CT urography proved effective in this emergency setting. The patient underwent urethral realignment with a Foley catheter and open reduction and internal fixation of the pubic diastasis. This case underscores the importance of prompt diagnosis and management of PFUI and highlights the role of CT urography in the evaluation of trauma patients.

Keywords: *Urethral Injury; High-Velocity Trauma; Pelvic Fracture; CT Urography; Pubic Diastasis; Trauma Management*

Abbreviations

PFUI: Pelvic Fracture Urethral Injury; CT: Computed Tomography; RUG: Retrograde Urethrography; ORIF: Open Reduction and Internal Fixation

Introduction

Pelvic fracture urethral injury (PFUI) is a critical complication resulting from high-velocity trauma, commonly associated with pelvic ring fractures. It predominantly affects the posterior urethra in males and may present with subtle or no symptoms, making early diagnosis challenging. While retrograde urethrography (RUG) is the diagnostic standard, CT urography provides an effective alternative, enabling the assessment of both the urethral injury and pelvic fractures in emergency situations. This case report underscores the importance of timely diagnosis and intervention, highlighting the utility of CT imaging in trauma management.

Case Presentation

A 56-year-old man presented to the emergency department after sustaining a road traffic accident, with an impact to the pelvis. He was conscious, hemodynamically and respiratory stable, but reported significant pain in the pubic region. Physical examination revealed extensive pubic and scrotal swelling. An urgent CT urography was performed. CT urography revealed extensive urethral contrast leakage 2 cm above the bladder base (Figure 1), extending to the prevesical space (Figure 2) and scrotum (Figure 3), with an associated 5 cm pubic diastasis (Figure 4). Urethral realignment was performed using a 16 Fr Foley catheter, with endoscopic follow-up in three weeks. The pubic diastasis was managed with open reduction and internal fixation (ORIF) using a plate and screws to stabilize the pelvic ring.

Figure 1: *Sagittal maximum intensity projection (MIP) CT scan showing posterior urethral contrast extravasation 2 cm above the bladder base.*

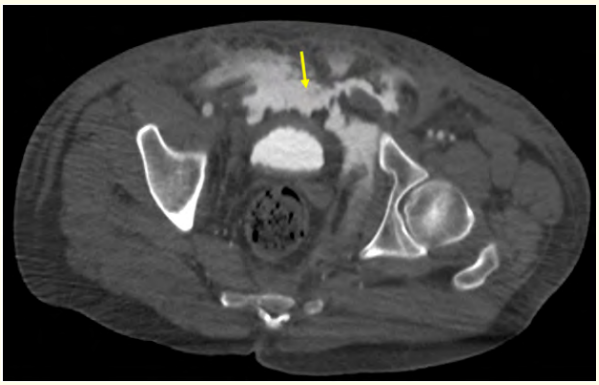

Figure 2: *Axial CT scan showing contrast extravasation in the prevesical space.*

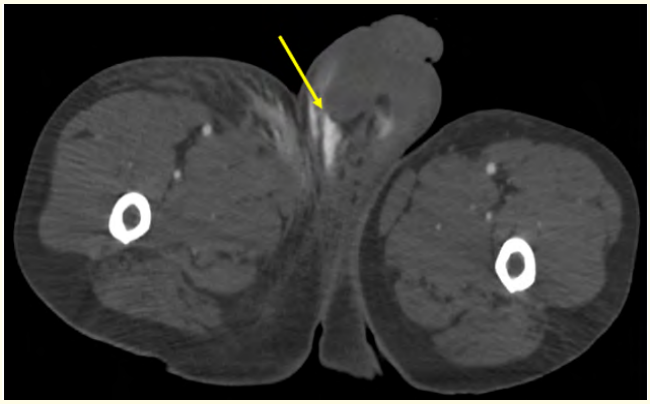

Figure 3: *Axial CT scan showing contrast extravasation in the scrotum.*

Discussion

Pelvic fracture urethral injury (PFUI) is a severe complication resulting from high-velocity trauma and is frequently associated with pelvic ring disruption. It predominantly affects the posterior urethra (prostatic and membranous segments) in males, occurring in 10% to 25% of pelvic fractures, especially with anterior ring disruption [1]. PFUI can present with a range of symptoms, including blood at the meatus, perineal ecchymosis, and urinary retention, although it may also remain asymptomatic or present with nonspecific signs, making early diagnosis challenging [2].

Diagnosis relies on retrograde urethrography (RUG), the gold standard for detecting urethral contrast extravasation. However, in emergency trauma settings, where rapid and comprehensive evaluation is needed, CT urography with a delayed phase has emerged as a valuable alternative, aiding in both urethral injury detection and pelvic fracture assessment [3].

Immediate management of pelvic fracture urethral injury (PFUI) focuses on urinary diversion to prevent further complications. The primary methods are suprapubic catheterization, which bypasses the injured urethra, and primary urethral realignment, where a Foley catheter is inserted to align the urethra and restore continuity. Suprapubic catheterization is often preferred for severe injuries or when realignment is not feasible. Both approaches aim to stabilize the patient and reduce the risk of long-term complications, such as incontinence or stricture formation [1].

Conclusion

In conclusion, this case highlights the diagnostic challenges and management considerations in PFUI, emphasizing the role of CT urography as a valuable diagnostic tool in polytrauma patients. Early recognition and appropriate intervention are critical to minimizing long-term complications, including urethral stricture, erectile dysfunction, and urinary incontinence. Multidisciplinary collaboration between trauma surgeons, urologists, and radiologists is essential in optimizing patient outcomes.

Conflict of Interest

The authors declare that there is no financial interest or conflict of interest related to this manuscript.

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