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MANAGEMENT OF ACUTE PENILE SHAFT FRACTURE WITH CONCOMITANT URETHRAL INJURY : A CASE REPORT

General Surgery

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ABSTRACT

Penile fracture is an uncommon and severe urological emergency involving the traumatic rupture of the tunica albuginea secondary to blunt forces applied to an erect penis. Concomitant urethral involvement represents an even rarer complication, demanding precise clinical evaluation, advanced radiological mapping, and urgent surgical intervention. This case report outlines the clinical course, diagnostic protocols, operative repair, and post-surgical management of a 29-year-old male who sustained a dual-corporeal tear and urethral transection during sexual intercourse, presenting 6 days post-injury. Through precise surgical reconstruction consisting of bilateral corporal repair and primary urethral anastomosis over an 18 French Foley catheter, an excellent cosmetic and structural outcome was achieved. This report emphasizes that immediate exploration and anatomical restoration remain the gold standard for avoiding long-term sequelae like erectile dysfunction, penile curvature, or urethral strictures.

KEYWORDS

INTRODUCTION & BACKGROUND

True urological emergencies involving the male genitalia require rapid, precise management to preserve fundamental physiological functions, specifically urinary continence and erectile potency. Among these, penile fracture stands out as a unique clinical entity defined by the structural disruption of the thick tunica albuginea due to direct, high-pressure blunt trauma to the erect penis. When erect, the tunica albuginea thins dramatically from its flaccid state thickness of approximately 2 mm down to a highly vulnerable 0.25 mm to 0.5 mm, reducing its capacity to absorb abnormal bending forces.

The classic mechanism of injury involves abnormal lateral or longitudinal buckling forces during vigorous sexual intercourse (coitus), typically occurring when the rigid penis slips out of the vaginal vault and forcefully strikes the female perineum or pubic symphysis. Other regional etiologies include forced manipulation (such as 'taqaandan' practiced in parts of the Middle East to achieve sudden detumescence), masturbation, or rolling over in bed. While single-corporeal tears are the norm, concomitant injury to the urethra occurs when high-energy trauma transfers across the intercorporeal septum, involving the corpus spongiosum. Epidemiological data indicates a significantly higher rate of urethral involvement in Western nations (up to 20%) where coitus-related trauma dominates, compared to Asian or Middle Eastern regions (around 3%) where self-inflicted manipulation is the predominant mechanism.

CASE PRESENTATION

Clinical History and Presentation

A 29-year-old male presented to the Urology Outpatient Department (OPD) with severe circumferential swelling, painful induration, and distinct dark bluish discoloration across the entirety of the penile shaft. The patient reported a historical onset of trauma during vigorous sexual intercourse exactly 6 days prior to presentation. At the exact moment of injury, he described hearing an audible 'cracking' or 'snapping' sound, which was followed immediately by rapid detumescence, excruciating localized pain, and progressive, severe edema that quickly assumed a classic, distorted presentation.

Physical Examination

On physical inspection and palpation, the penis demonstrated a profound macrovascular contusion and extensive ecchymosis, yielding the characteristic 'Eggplant Deformity' (massive purple swelling with deviation away from the side of the tunica tear). Palpation along the shaft revealed a distinct, palpable structural defect within the corporal bodies along the distal-to-mid shaft region, posterior to the suspensory ligament. Focused examination revealed focal tenderness but no frank urinary retention, although blood at the meatus was noted. Due to the high suspicion of direct spongiosa or urethral compromise, immediate Foley catheterization was attempted and successfully performed with extreme care, draining clear urine. The patient was subsequently admitted to the Male Surgery Ward, and routine hematological, biochemical, and pre-operative screenings were initiated.

Figure 1 : Clinical Presentation of the patient 6 days post- trauma, demonstrating sever edema, ecchymosis, and classic "eggplant" deviation away from the rupture site.

Diagnostic Workup & Advanced Imaging

Given the delayed presentation (6 days post-injury) and the clinical index of dual-corporeal and urethral involvement, Magnetic Resonance Imaging (MRI) of the pelvis and penile shaft was performed to establish a definitive anatomical map before exploration. MRI is established as the premier diagnostic modality for complex penile trauma, offering clear soft-tissue contrast across the structural layers of the genitalia.

Table 1: Diagnostic Metrics of MRI in Penile Trauma Validation

Anatomical Structure Investigated	Sensitivity (%)	Specificity (%)	Clinical Relevance & Image Correlation
Tunica Albuginea & Corpora Cavernosa	100.0%	77.8%	Accurately localizes the site, depth, and extent of the tear. Correlates perfectly with direct intraoperative exploration.
Urethral Lesions / Corpus Spongiosum	60.0%	78.3%	Lower sensitivity due to partial tears or obscuration by hematoma; requires clinical/retrograde validation or direct visualization.

The multiplanar T2-weighted MRI sequences revealed a complete structural tear disrupting BOTH corpora cavernosa. Furthermore, there was significant evidence of continuity disruption within the ventral aspect, involving the corpus spongiosum and confirming a concomitant urethral injury. Based on the triad of clinical presentation, physical findings, and definitive MRI confirmation, the final diagnosis was established as: Penile shaft fracture with associated urethral injury.

SURGICAL MANAGEMENT & INTRAOPERATIVE TECHNIQUE

Due to the extensive nature of the double-corporeal disruption and confirmed urethral breach, immediate surgical exploration was scheduled under general anesthesia. The primary objective was complete anatomical restoration of the continuity of the tunica albuginea and tension-free micro-anastomosis of the urethra to prevent future corporal fibrosis or urethral stricture disease.

Operative Approach and Exposure

The patient was prepped and draped in the supine position. A circular sub-coronal incision was made, followed by complete degloving of the penile shaft skin down to the base of the penis. This approach provided excellent, unhindered circumferential exposure of both corpora cavernosa, the corpus spongiosum, and the entire trajectory of the anterior urethra. Extensive hematoma evacuation was meticulously carried out to identify the borders of the healthy tissue.

Corporate and Urethral Reconstruction

Upon deep dissection, a large, ragged bilateral defect spanning across the intercorporeal septum was fully visualized. The surgical steps proceeded as follows:

- Corporal Debridement and Repair: The edges of the ruptured tunica albuginea were gently debrided to remove necrotic or friable tissue resulting from the 6-day delay. Primary closure of the defect in both corpora cavernosa was executed using interrupted 3-0 polyglactin (absorbable, braided synthetic) sutures. The knots were inverted to maximize structural strength and minimize postoperative palpability or irritation during erections.

- Urethral Identification and Exploration: Further focal inspection of the ventral midline revealed a significant partial transection/tearing of the anterior urethra, with visible exposure of the indwelling transurethral catheter. The mucosal borders were clean but required meticulous mobilization to avoid tension.

- Primary Urethral Repair: The partial urethral tear was primarily reconstructed over an 18 French silicone Foley catheter. Closure was completed using interrupted 4-0 polyglactin sutures in a water-tight, non-strangulating fashion, ensuring mucosal inversion to prevent urinary extravasation into the adjacent corporal spaces.

- Closure and Dressing: Hemostasis was verified via saline injection testing. The penile skin was re-approximated, and a sub-coronal closure was completed. A moderately compressive conformable fluff dressing was applied around the shaft to prevent localized hematoma re-accumulation without compromising arterial inflow.

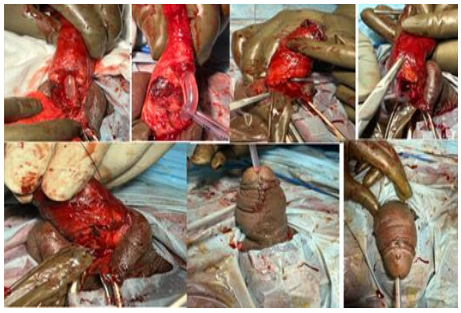

Figure 2: Intraoperative view following penile degloving and hematoma evacuation, highlighting the bilateral corporeal tear and primary water- tight urethral anastomosis

POSTOPERATIVE COURSE, MONITORING, AND OUTCOME

The postoperative management plan focused on preventing involuntary nocturnal erections, managing localized edema, and ensuring adequate healing of the urethral anastomosis. The patient was placed on a strict regimen of oral sedatives and anti-androgens (such as diazepam and stilbestrol) to suppress nocturnal tumescence. Broad-spectrum prophylactic antibiotics and adequate analgesics were administered continuously.

The patient tolerated the immediate post-surgical phase exceptionally well, with progressive reduction of local edema and minimal incisional pain. Discharge from the hospital occurred on postoperative day 7 with explicit care instructions for the indwelling urinary catheter. Due to the high risk of stricture formation following primary repair of a delayed urethral injury, the duration of postoperative transurethral catheterization was maintained for a total of 21 days. At the 3-week mark, a peri-catheter retrograde urethrogram verified excellent structural continuity without any extravasation, leading to successful removal of the Foley catheter. Follow-up evaluations at subsequent months demonstrated normal, unobstructed voiding patterns and excellent preservation of erectile function, with no reported penile deviation, chordee, or palpable painful plaques.

DISCUSSION & LITERATURE REVIEW

Penile fracture is an uncommon urological emergency that warrants a high index of clinical suspicion. While history and physical inspection are usually pathognomonic—characterized by an audible snap, immediate detumescence, and the development of an eggplant deformity—delayed presentations or multi-compartmental trauma often complicate the clinical picture. Historically, conservative management involving splinting, ice packs, and anti-fibrinolytics was favored; however, modern urological literature has definitively shown that non-operative strategies lead to unacceptable complication rates, including penile curvature/chordee (10%), debilitating erectile dysfunction (up to 30%), and chronic painful erections due to irregular plaque formation.

In contrast, immediate surgical exploration and repair of the tunica albuginea and corporal bodies represents the undisputed gold standard of modern care, yielding the fastest recovery times, optimal preservation of erectile potency, and excellent structural outcomes. When concomitant urethral injury is suspected—indicated by macroscopic hematuria, blood at the external urethral meatus, or acute urinary retention—urgent diagnostic imaging or direct exploratory visualization is mandatory. Although retrograde urethrography has been a traditional mainstay, multiplanar MRI offers superior, non-invasive anatomical rendering of both the tunica albuginea and the corpus spongiosum, making it an invaluable tool for preoperative planning, particularly when a patient presents several days after the initial traumatic event.

Surgical reconstruction must utilize a sub-coronal degloving incision to allow complete inspection of all compartments. The use of absorbable synthetic sutures like polyglactin ensures strong, long-term tensile support during the critical healing phase while avoiding the permanent foreign-body reactions associated with non-absorbable

materials. For the urethra, a water-tight, tension-free repair over a generous catheter (16-18 Fr) for an extended duration (typically 14 to 21 days for complex or delayed cases) minimizes the incidence of postoperative extravasation, which is the primary driver of stricture formation and dense periurethral fibrosis.

CONCLUSION

Penile fracture, particularly when complicated by simultaneous bilateral corporeal tears and urethral involvement, is a rare and intricate urological emergency. This case underscores several critical principles: (1) Prompt clinical suspicion and thorough physical evaluation are vital in identifying multi-compartmental penile trauma; (2) Advanced radiological imaging, specifically MRI, provides definitive anatomical support that correlates perfectly with intraoperative findings; (3) Urgent, meticulous surgical reconstruction utilizing absorbable sutures produces superior structural and functional results with exceptionally low rates of long-term complications; and (4) Strict adherence to postoperative protocols, including prolonged catheterization and erection suppression, ensures optimal healing. Favorable outcomes can be consistently achieved even in delayed presentations through structured examination, appropriate imaging, and timely surgical intervention.

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