Penile fracture with bilateral corporeal rupture and complete urethral disruption: case report and literature review

Nathan A. Hoag, MD; Kiara Hennessey, MD; Alan So, MD, FRCSC

Abstract

Penile fracture is a rare injury most commonly sustained during sexual intercourse. We report the case of a 35-year-old man who presented with bilateral rupture of the corpora cavernosa and complete disruption of the urethra. A review of the literature on penile fracture is also presented. Urgent surgical exploration was performed and the injuries repaired primarily. In follow-up, the patient reported satisfactory erectile function. This case highlights the importance of early surgical repair and evaluation for concomitant urethral injuries in cases of penile fracture.

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Case report

We report the case of a 35-year-old male who presented to the emergency department 1 hour following blunt injury of the penis during sexual intercourse. The patient reported a "tearing/popping" sensation, rapid detumescence, severe penile pain and frank blood per urethra. The patient was unable to void following the injury.

Physical examination demonstrated a tender and swollen penis with hematoma extending over the proximal penile shaft, scrotum and perineum. This examination suggested extension beyond Buck's fascia, but the hematoma appeared contained within Colles' fascia. Blood was visible at the urethral meatus (Fig 1). "Rolling sign" was present bilaterally, palpated at the sites of tunical disruption about 3 cm from the base of the penis and was tender on examination. The scrotum was swollen and painful to palpation, but the testicles felt structurally normal. Abdominal examination was unremarkable, though the bladder was palpable.

The patient was healthy with no medications or allergies. There was no known previous urologic history.

The patient was taken to the operating room for urgent exploration of suspected penile fracture with associated urethral injury. An intraoperative retrograde urethrogram (RUG) was performed that demonstrated urethral disruption at the level of the penoscrotal junction (Fig. 2). A suprapubic tube using a 12-French Foley catheter was placed.

A subcoronal circumferential incision was made and the penis degloved. Obvious disruption of Buck's fascia was evident; upon exploration, bilateral, 1-cm transverse ruptures of the corpora cavernosa were discovered on the proximal penile shaft (Fig. 3). The defects were repaired with 3-0 vicryl sutures in a simple running fashion. Exploration of the corpus spongiosum revealed complete disruption of the urethra (Fig. 4). This was repaired over an 18-French council tip catheter with 4-0 PDS suture with a simple interrupted end-to-end primary reanastomosis in a tension-free fashion (Fig. 5).

The patient recovered well in hospital and was discharged on postoperative day 2 on antibiotics with a Foley catheter to straight drainage and suprapubic catheter capped. The patient was advised to abstain from intercourse for at least 4 weeks. The patient underwent a RUG on postoperative day 15, which demonstrated mucosal irregularity at the bulbar/penile urethral junction with no contrast extravasation (Fig. 6). The urethral catheter was therefore removed, with the capped suprapubic catheter removed on postoperative day 28. Upon follow-up on day 28, the patient reported normal voiding and satisfactory painless erections.

Discussion

Penile fracture, in which there is disruption of the tunica albuginea and rupture of the corpora cavernosum, is uncommon. In North America, it is most commonly associated with sexual intercourse and occurs when the rigid penis slips from the vagina striking the partner's perineum or pubic bone.[1] In Middle East countries, a common cause of penile fracture is self-inflicted injury.[2] This is a practice termed *taghaandan* and occurs when the erect penis is bent or struck to achieve rapid detumescence.[1-3]

The tunica albuginea is a structure of great tensile strength that is able to withstand rupture at pressures up to 1500 mmHg. The tunica albuginea thins markedly during erection, which when combined with abnormal bending

Fig. 1. Penile fracture with blood at meatus and developing hematoma.

Fig. 2. An intraoperative retrograde urethrogram was performed that demonstrated urethral disruption at the level of the penoscrotal junction.

leads to excessive intracavernosal pressure and most often a transverse laceration of the proximal shaft.[1,4]

It has been suggested that traumatic penile rupture may be associated with histologic changes in the tunica albuginea rendering it more prone to fracture.[5] Evidence of fibrosclerosis and cellular infiltrates have been documented on pathologic review of ruptured tunica albuginea.[5] This is thought to be due to previous trauma which could predispose to rupture at lower pressures than with healthy tunica.[5]

While intercourse and self-manipulation account for most cases of penile fracture, there have been reports of fracture following a fall from bed with an erect penis, rolling over in bed during nocturnal tumescence, attempting to correct congenital chordee, disentangling an erect penis from a garment, hitting an erect penis against a toilet seat, following forceful contact with the dashboard of a stopping car and masturbating into a cocktail shaker.[2,6-11]

Often, the laceration is unilateral though bilateral rupture accounts for 2% to 10% of cases.[12-15] Associated urethral injury is rare, with reported frequencies in the 9% to 20% range.[15-18] Patients with bilateral corporeal rupture should be assumed to have urethral injury, as previous reports have documented this association.[19-21]

The diagnosis of penile fracture is typically made clinically.[1] Classic features include the patient reporting an audible "popping" sound, rapid detumescence, pain, penile swelling and deviation of the penis often to the side opposite the injury secondary to mass effect of the hematoma at the injury site.[1] Following injury, if Buck's fascia remains intact, the hematoma develops resulting in the characteristic "eggplant deformity."[1,22,23]

The defect at the fracture site is often palpable and has been described as the "rolling sign." This represents a firm, mobile, tender mass, where the penile skin can be rolled over the blood clot.[24]

History and physical examination are sufficient to make the diagnosis in most penile fracture cases. Therefore, additional diagnostic imaging modalities, such as cavernosography and sonography, are often unnecessary and are often best reserved for cases where the diagnosis is unclear or the history is not

Fig. 3. Intraoperative photo demonstrating bilateral transverse rupture of the corpora cavernosa.

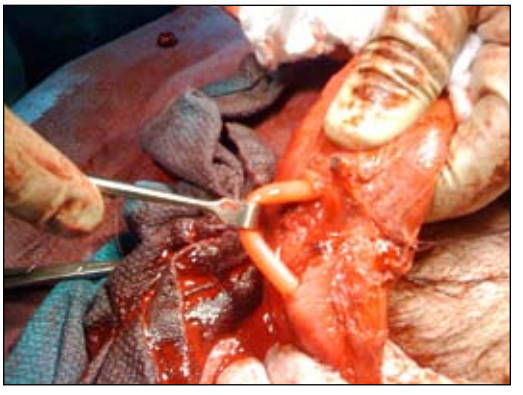

Fig. 4. Intraoperative photo showing complete urethral disruption.

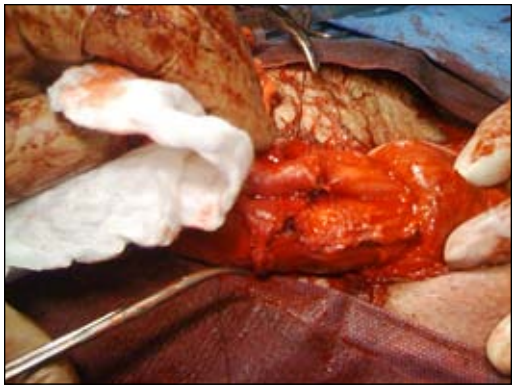

Fig. 5 Photo showing primary reanastomosis of urethra.

typical. Retrograde urethrography is a valuable tool to evaluate urethral injuries.[15,21,23] Magnetic resonance imaging has been advocated, and though this modality can be useful in assessing penile fracture, availability and cost have limited its use.[15,25,26]

False penile fracture has been described in the setting of penile trauma with swelling and ecchymosis, though the classic "pop" sound and rapid detumescence are absent.[27] The most common mimic of penile fracture is vascular injury to the dorsal penile artery and vein and is an instance where cavernosography may be useful.[28,29] When discovered intraoperatively, the injured dorsal penile vein may be managed with ligation.[30]

Studies comparing surgical versus conservative treatment favour immediate surgical exploration and reconstruction. Conservative treatments have included compression bandages, ice packs, fibrinolytics, anti-inflammatories, sedatives and anti-androgens.[8,31-32] Immediate intervention has been associated with shorter duration of hospital stay, higher levels of patient satisfaction, and improved outcomes including reduced incidence of erectile dysfunction.[15,17,18,33-35]

Ibrahiem and colleagues recently published a series of 155 cases where normal erectile function in the absence of curvature or scarring was observed in 77% of patients.[15]

A subcoronal or circumferential is the best described surgical approach, allowing good visualization of all 3 corporeal compartments and allowing for exploration and repair of any concomitant urethral injury.[9,34] Other approaches described include penoscrotal, inguinoscrotal, lateral and suprapubic incisions.[36,37]

Conclusion

Penile fracture remains a rare, yet likely underreported condition. Diagnosis is usually clinical and urgent surgical exploration and repair should be undertaken to improve outcomes. Urethral injury should be suspected in penile fracture, especially in those cases with bilateral cavernosal rupture or suggestive clinical features.

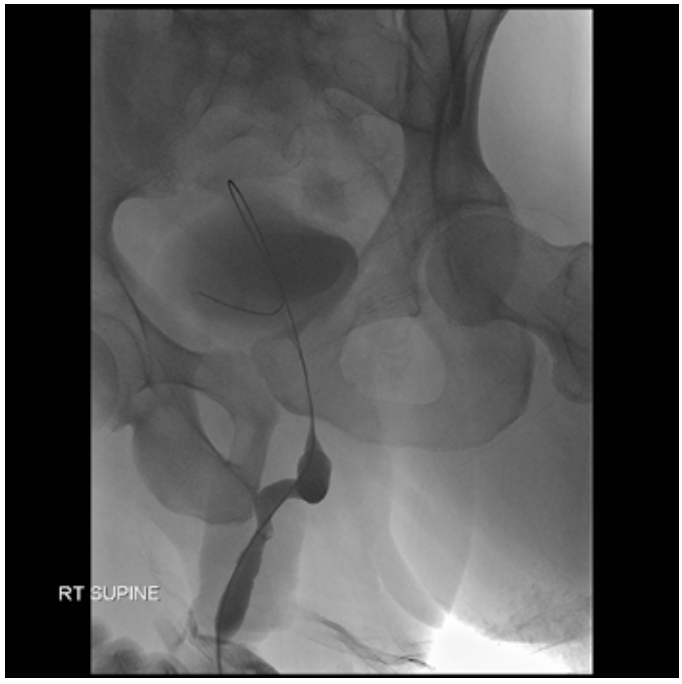

Fig. 6. Postoperative day 15: retrograde urethrogram demonstrating intact urethra.

Department of Urologic Sciences, University of British Columbia, Gordon & Leslie Diamond Health Care Centre, Vancouver, BC

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Correspondence: Dr. Nathan A. Hoag, Department of Urologic Sciences, University of British Columbia, Gordon & Leslie Diamond Health Care Centre, Level 6, 2775 Laurel St., Vancouver, BC V5Z 1M9; natman@interchange.ubc.ca