Case Report

Fracture of the Penis with Urethral Rupture

Urgent message: Failure to diagnose and, if necessary, repair penile fracture can result in devastating consequences such as stricture, fistula, and long-term voiding difficulty.

TAYT ELLISON, MS-3, SHAILENDRA SAXENA, MD, PhD, LAURA KLUG, PharmD, and SANJEEV SHARMA, MD

Introduction

Although penile trauma is not a common presentation in the urgent care setting, it is underreported because of embarrassment, as are other injuries related to sexual activity. The urgent care clinician should be prepared to evaluate these conditions with an emphasis on the identification of more complicated injuries requiring surgical intervention. In this case report, we discuss penile fracture complicated by urethral rupture. This is a concerning condition requiring emergency surgical repair to reduce the potential for consequences such as stricture, fistula, and long-term voiding difficulty.

Case Presentation

A 51-year-old healthy man presented to an urgent care center because of penile pain. He reported experiencing trauma during sexual intercourse that occurred 2 days before he was seen at the center. He delayed seeking treatment because he was embarrassed. He reported gross hematuria, rapid detumescence, audible cracking sounds, and the formation of a hematoma occurring at the time of the trauma. His vital signs and findings on physical examination were normal except for the penile trauma. The external genitals and scrotum were normal. His circumcised penis was nontender, but the ventral surface was swollen, and there was a hematoma. He reported no pain but had experienced difficulty voiding since the injury, and urinalysis findings were positive for blood.

At Creighton University School of Medicine in Omaha, Nebraska, **Tayt Ellison, BA**, is a third-year medical student and **Shailendra Saxena, MD, PhD**, and **Sanjeev Sharma, MD**, are associate professors of family medicine. **Laura Klug, PharmD**, is an assistant professor of pharmacy practice at Creighton University School of Pharmacy and Health Practice, also in Omaha.

Diagnosis and Disposition

Because of the reported trauma and our findings on clinical examination, we suspected that our patient had sustained a penile fracture.

We referred the patient for surgical evaluation and repair. During surgical intervention, a urethral tear was

Table 1. Red Flags for Penile Trauma
• A cracking noise
• Immediate loss of erection
• Penile swelling
• Blood at the tip of the penis
• Blood in the semen
• Blood in the urine
• Penile bruising
• Penile dents
• Penile pain

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identified and repaired. At the time of publication, the patient was fully recovered and all symptoms had resolved.

Discussion

Anatomy

The penis has 3 main components: shaft, root, and glans. In trauma to the erect penis, fracture occurs in the shaft. Erectile tissues engorge with blood to attain erection. Erectile tissues are composed of the paired corpus cavernosa on the dorsal surface and the corpus spongiosum in the midline of the ventral surface facing the scrotum. Deep arteries, extending from the internal pudendal arteries, run centrally in the cavernosa, supplying blood to the helical arteries, which then supply blood to the erectile tissues. The urethra is located within the spongiosum on the ventral side of the penis. The paired corpus cavernosa are covered by a fibrous sheath known as the tunica albuginea. Superficial to this, just below the skin and encasing the venous drainage, is Buck fascia. The deep dorsal penile vein runs outside the tunica albuginea under the Buck fascia, whereas the superficial dorsal vein runs over it.[1]

Clinical Presentation

Penile fracture, or ripping of the tunica albuginea, is an underreported injury.[2] During erection, the tunica becomes increasingly thin, down to about 0.25 mm, as opposed to 2.5 mm in the flaccid penis.[2–4] In trauma, the engorged penis is forcibly bent, creating pressure in the corpus cavernosa and spongiosum of up to 1500 mm Hg. This massive pressure causes ripping of the thinned tunica albuginea.[4] **Table 1** summarizes red flags in penile trauma.

Penile fracture is diagnosed by the presence of hematoma, rapid detumescence, and audible cracking.[5] All three conditions need not be present for diagnosis, however. El Atat et al found that of 300 patients with penile fracture, 100% reported penile swelling, ecchymosis, and rapid detumescence, but only 50% had audible cracking.[6] Other studies have reported swelling and ecchymosis in 100% of patients, and penile pain, detumescence, and acoustic cracking in 64.7%, 52.9%, and 35.3%, respectively.[7] Dorsal vein rupture can be mistaken for penile fracture and usually differs only in the lack of audible cracking sounds and gradual, rather than rapid, detumescence.[2,8]

Urethral damage with long-term voiding complications is of concern with penile fracture. Urethral rupture can result from a corporal fracture, damaging the spongiosum and resulting in hemorrhage.[9] Gross hematuria after injury or microscopic hematuria detected by dipstick urinalysis warrants a clinical work-up.[7] In one study, 5 of 7 (71.4%) urethral injuries resulted in microscopic hematuria, and 3 of 4 bilateral corporal tears were associated with urethral injury, versus 4 of 21 unilateral corporal tears.[7] The findings of Yamaçake et al also support a strong relationship between urethra rupture and bilateral corporal tears.[10] It has also been suggested that urethral injury is related to the mechanism of injury. Urethral injury is correlated with sexual intercourse because torque is applied to the penis, increasing the risk of a spongiosum or urethral tear.[6] Moreno Sierra et al found urethral injury to be more prominent with trauma of greater intensity such as coitus. That study suggested that urethral injuries occur in 10% to 30% of penile fractures.[9] Despite the risk of urethral damage, most penile fractures are small, unilateral tears with no urethral involvement.[2,6] In fact, El Atat et al found that of 300 patients presenting with penile fracture, only 5 (1.6%) had urethral injury.[6] Yonguc et al reported that bilateral corporal rupture accounts for only 2% to 10% of penile fractures and that of those fractures, urethral tears occur in 9% to 20% of cases.[11] Regardless, suspicion of urethral injury with penile fracture should be high when there is penile

trauma, and a thorough medical history, including the mechanism of injury, should be obtained to assess possible urethral damage.

Treatment

Surgical exploration is the most common means of assessing urethral patency. During surgical repair, intraoperative urethrography may also be used to assess urethral patency.[12] Preoperative retrograde urethrography may also be performed.[10] During a urethrogram, contrast agent is injected into the urethra, and rupture is identified by the agent entering and collecting in the corpora cavernosa.[13] Although urethrography is not the current standard of care in assessing urethral injury, some believe that it is underutilized and that only in the setting of complete lack of urinary symptoms and clinical findings should it be forgone. For patients with voiding difficulty, hematuria, or blood at the meatus, urethrography should be considered.[4] Although effective in diagnosing urethral rupture, urethrography also presents risks, such as increasing existing damage and infection.[9] Further, the sensitivity of urethrography in diagnosing urethral rupture with penile fracture is only 50%. Other available imaging options to assess urethral patency include ultrasonography and intraoperative flexible cystoscopy.[10]

Conservative care, which entails using compression sleeves, ice packs, and nonsteroidal anti-inflammatory drugs, is no longer recommended because it can lead to sequelae such as penile curvature, erectile dysfunction, and painful erection.[3–6,8–10,12] Surgical repair of the tunica and urethra is the standard of care for penile fracture; it may be followed by a period of catheter use.[9,14] The timing of surgical intervention, however, is under review. Current literature promotes urgent surgical repair within 48 hours of injury.[4,10] However, emerging data suggest that postponing surgical intervention for 7 to 12 days may be beneficial.[5] Naraynsingh et al reported details of a case involving a patient presenting for surgical repair 3 weeks after injury. By then, swelling had subsided, making damage location easier and minimizing invasive surgical repair.[14]

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Gross hematuria after injury, microscopic hematuria detected by dipstick urinalysis, and bilateral corporal fractures warrant further clinical work-up for urethral rupture associated with penile fracture. In addition to surgical exploration, intraoperative or preoperative urethrography may also be used to assess urethral patency.

Take-Home Points

Surgical ligation and catheter placement are essential to repair a ruptured urethra. Failure to diagnose and, if necessary, repair rupture can result in devastating consequences such as stricture, fistula, and long-term voiding difficulty. However, clinicians should keep in mind that the timing of repair is under review, with immediate repair being the standard practice and delayed repair suggested by recent case reports. ■

References

1. Netter FH, Colacino S. *Atlas of Human Anatomy*. Summit, NJ: CIBA-GEIGY, 1989; pp. 359–360.

2. Khan Z. Management of penile fracture and its outcome. *J Coll Physicians Surg Pak*. 2013;23:802–805.

3. El-Taher A, Aboul-Ella H, Sayed M, et al. Management of penile fracture. *J Trauma*. 2004;56:1138–1140.

4. Jack GS, Garraway I, Reznichek R, et al. Current treatment options for penile fractures. *Rev Urol*. 2004;6:114–120.

5. Özorak A, Ho can M, Oksay T, et al. Management and outcomes of penile fracture: 10 years' experience from a tertiary care center. *Int Urol Nephrol*. 2014;46:519–522.

6. El Atat R, Sfaxi M, Benslama MR, et al. Fracture of the penis: management and long-term results of surgical treatment. Experience in 300 cases. *J Trauma*. 2008;64:121–125.

7. Hatzichristodoulou G, Dorstewitz A, Gschwend J, et al. Surgical management of penile fracture and long-term outcome on erectile function and voiding. *The J Sex Med*. 2013;10:1424–1430.

8. Kurkar A, Elderwy A, Orabi H. False fracture of the penis: different pathology but similar clinical presentation and management. *Urol Ann*. 2014;6:23–26. Available from: MEDLINE Complete, Ipswich, MA. Accessed August 20, 2014.

9. Moreno Sierra J, Garde Garcia H, Fernandez Perez C, et al. Surgical repair and analysis of penile fracture complications. *Urol Int*. 2011;86:439–443.

10. Yamaçake K, Tavares A, Padovani G, et al. Long-term treatment outcomes between surgical correction and conservative management for penile fracture: retrospective analysis. *Korean J Urol*. 2013;54:472–476.

11. Yonguc T, Bozkurt IH, Ors B, et al. Penile fracture with bilateral corporeal rupture without urethral involvement. *Can Urol Assoc J*. 2014;8:E51–E53.

12. Nason G, McGuire B, Liddy S, et al. Sexual function outcomes following fracture of the penis. *Can Urol Assoc J*. 2013;7:252–257.

13. Garg M, Goel A, Dalela D, et al. Penile fracture with urethral injury: evaluation by contrast imaging. *BMJ Case Rep*. 2013;2013. pii: bcr2013010318. doi:10.1136/bcr-2013-010318.

14. Naraynsingh V, Hariharan S, Goetz L, et al. Late delayed repair of fractured penis. *J Androl*. 2010;31:231–233.