DOI: 10.4081/aiua.2014.1.39

CASE REPORT

Penile fracture: Penoscrotal approach with degloving of penis after Magnetic Resonance Imaging (MRI)

Gabriele Antonini [1], Patrizio Vicini [3], Salvatore Sansalone [4], Giulio Garaffa [4], Antonio Vitarelli [5], Ettore De Berardinis [1], Magnus Von Heland [1], Riccardo Giovannone [1], Emanuele Casciani [2], Vincenzo Gentile [1]

[1] Department of Urology, "Sapienza" Rome University, Rome, Italy;
[2] Department of Radiology, "Sapienza" Rome University, Rome, Italy;
[3] Department of Urology, "I.N.I." Italian Neurotraumatologic Institute Grottaferrata, Rome, Italy;
[4] Department of Experimental Medicine and Surgery, "Tor Vergata" Rome University, Rome, Italy;
[5] Department of Urology, Bari University, Bari, Italy.

Summary ***Fracture of the penis, a relatively uncommon emergency in Urology, consists in the traumatic rupture of the tunica albuginea of the corpus cavernosum. Examination and clinical history can be highly suspicious of penile fracture in the majority of cases and ultrasonography (USS) can be useful to identify the exact location of the tunical rupture, which is proximal in 2/3 of cases and therefore manageable through a penoscrotal approach. Although expensive and not readily available in the acute setting, Magnetic Resonance Imaging (MRI) may play a role in the differential diagnosis with rupture of a circumflex or dorsal vein of the penis or when the tunical rupture is not associated with tear of the overlying Buck's fascia. This form of imaging is more sensitive than USS at identifying the presence of a tunical tear. The treatment of choice is immediate surgical repair, which allows preserving erectile function and minimizing corporeal fibrosis.***

KEY WORDS: *Penile fracture; Magnetic Resonance Imaging (MRI); Ultrasonography; Fibrosis; Erectile dysfunction.*

Submitted 13 February 2014; Accepted 28 February 2014

INTRODUCTION

Fracture of the penis, which consists in the traumatic rupture of the tunica albuginea of the corpus cavernosum, is a relatively uncommon emergency in Urology and it may be associated with urethral trauma in 1% to 38% of cases.

It usually occurs when the erected penis hits the female pelvis during enthusiastic sexual intercourse. As the thickness of tunica albuginea decreases from 2 mm in the flaccid state to 0.25 mm during the erect state, a sudden increase in intracorporeal pressure due to blunt trauma during an erection could easily result in a rupture. All penile fractures occur on the shaft penis and in 2/3 of cases the tear is located at the level of the penoscrotal junction. Although trauma during intercourse is the most common cause of penile fracture in the Western World, penile self-manipulation to stop erection is the most common etiology in The Middle East and the Persian Gulf (1-8). Accurate history taking and clinical examination represent the mainstay in the diagnosis of penile fracture. Typically the patient reports a "*popping*" sound followed by immediate detumescence. Generally the penis appears diffusely swollen; if Buck's fascia is breached, a diffuse hematoma is visible on the penis ("*eggplant deformity*") and may extend to the scrotum, groin and perineum (the "*butterfly sign*"). Early surgical exploration is paramount to guarantee the preservation of the erectile function, to minimize the formation of corporeal fibrosis and to identify and repair an associated urethral rupture. Although several reports suggest that diagnostic investigations, add little information to the clinical diagnosis, add extra costs to the treatment and potentially can delay surgery, penile ultrasonography (USS) is promptly available, reasonably cheap and allows to identify the exact location of the tunical tear (9). Magnetic Resonance Imaging (MRI) is not frequently performed, as USS can provide all the necessary information and may not be available in the out of hour settings. However, it guarantees superior image quality and allows better differentiating between penile fracture and other conditions such as rupture of the deep dorsal vein or circumflex veins, which produce a penile hematoma similar to the one present in case of tunical tear, but do not require surgical treatment. MRI is also an adjunctive tool in the evaluation of atypical presentation of a suspected penile fracture, as has the ability to identify disruption of the corpus cavernosum due to excellent tissue contrast and visualization of soft tissue pathological processes (10). Over the last 3 decades, management of penile fracture has progressively shifted from a conservative approach to early surgical repair, as non surgical management was associated with the formation of fibrosis of the corpora cavernosa and led invariably to a degree of curvature and erectile dysfunction (4). Surgical treatment aims at repairing the torn tissue of tunica albuginea. Although adequate expo-

No conflict of interest declared

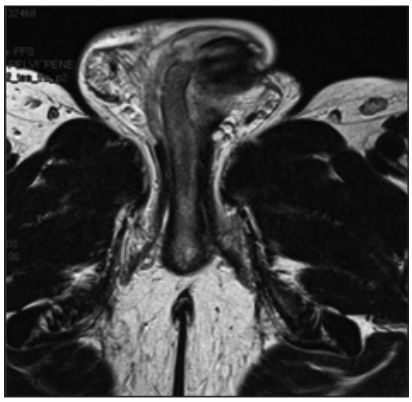

Figure. *Magnetic Resonance Imaging with gadolinium showing the interruption of tunica albuginea at the level of the proximal third of right corpus cavernosum without urethral involvement.*

sure of the penile shaft can be achieved through a subcoronal circumferential incision, 2/3 of penile fractures occur in the proximal third of the shaft and these patients would be therefore better served with a penoscrotal approach (7, 8). Furthermore, degloving a bruised edematous penis can be quite challenging and a circumcision would be required to prevent preputial complications. Imaging can be extremely helpful for the surgeon in order to identify distal fractures, which require a degloving, from proximal fractures, which can be easily dealt with through a penoscrotal approach.

Discussion

Penile fracture occurs during erection, as the expansion of the corpora stretches the tunica albuginea and renders it thinner and more vulnerable to trauma. Although the diagnosis of penile fracture is often based on history and physical examination, imaging can be particularly useful when the clinical picture is not fully clear and when planning the type of surgical approach. Among the radiological investigation, USS is the most widely used, as it is readily available and relatively inexpensive. However, although this form of imaging is highly specific in detecting a fracture, it is not very sensitive for detecting a cavernosal tear (6, 8, 9). On the contrary, MRI scan of the penis is highly sensitive at detecting the exact location of the tunical tear and allows the surgeon to chose the best surgical approach. Therefore, although more expensive and not always readily available in the acute setting, MRI should be considered the gold standard diagnostic investigation in case of suspected penile fracture.Although penile degloving is the most commonly used surgical approach, as it allows visualizing and inspecting adequately all the corpora cavernosa and urethra, it can be very morbid, due to the presence of diffuse bruising and edema of the Dartos fascia. As 2/3 of fractures occur all the way down on the proximal aspect of the shaft, a complete degloving becomes an unnecessary procedure, as a penoscrotal approach would guarantee adequate exposure in these patients (7, 8). Magnetic resonance imaging or USS of the penis play therefore a pivotal role for the identification of the exact location of the tear and therefore allow the surgeon to adequately choose the most appropriate surgical approach. Surgery should be immediate, in order to preserve as much cavernosal tissue as possible and to minimize the formation of corporeal fibrosis, which would lead to ED, penile shortening and curvature (3-5). Although patient history and clinical examination are highly sensitive and accurate in predicting the presence of a penile fracture, diagnostic imaging such as MRI and USS of the penis can be very useful to confirm the diagnosis and to identify the exact location of the tunical tear and to plan the type of surgical approach (9). When readily available, MRI should be the first choice modality of investigation due to its superior sensitivity in detecting tunical injuries (9).

References

1. García Gómez B, Romero J, Villacampa F, et al. Early treatment of penile fractures: our experience. Arch Esp Urol. 2012; 65:684-688.

2. Murray KS, Gilbert M, Ricci LR, et al. Penile fracture and magnetic resonance imaging. Int Braz J Urol. 2012; 38:287-8.

3. Wen J, Li HZ, Ji ZG, Li HJ. Immediate surgical intervention for penile fracture: a case report and literature review. Chin Med Sci J. 2011; 26:132-4.

4. Garaffa G, Raheem AA, Ralph DJ. Penile fracture and penile reconstruction. Curr Urol Rep. 2011; 12:427-31.

5. Hatzichristodoulou G, Dorstewitz A, Gschwend JE, et al. Surgical management of penile fracture and long-term outcome on erectile and voiding. J Sex Med. 2013; 10:1424-30.

6. Choi MH, Kim B, Ryu JA, et al. MR Imaging of acute penile fracture. Radiographics. 2000; 20:1397-405.

7. Ozcan S, Akpinar E. Diagnosis of penile fracture in primary care: A case report. Cases J. 2009; 2:8065.

8. Srinivas BV, Vasan SS, Mohammed S. A case of penile fracture at the crura of the penis without urethral involvement.Indian J Urol. 2012; 28:335-337.

9. Agarwal MM, Singh SK, Sharma DK, et al. Fracture of the penis: a radiological or clinical diagnosis? A case series and literature review. Can J Urol. 2009; 16:4568-4575.

10. Koifman L, Barros R, Júnior RA, et al. Penile fracture: diagnosis, treatment and outcomes of 150 patients. Urology. 2010; 76:1488-92.

Case Report and Figures are posted in Suppementary materials on www.aiua.it.

Correspondence

Gabriele Antonini, MD
Ettore De Berardinis, MD
Magnus Von Heland, MD
Riccardo Giovannone, MD
Vincenzo Gentile, MD
Department of Urology, "Sapienza" University. Rome, Italy

Emanuele Casciani, MD
Department of Radiology, "Sapienza" University, Rome, Italy

Patrizio Vicini, MD (Corresponding Author)
patriziovicini@gmail.com
Department of Urology, "I.N.I." Italian Neurotraumatologic Institute Grottaferrata, Rome, Italy

Salvatore Sansalone, MD
Giulio Garaffa, MD
Department of Experimental Medicine and Surgery, "Tor Vergata" University, Rome, Italy

Antonio Vitarelli, MD
Department of Urology, Bari University, Bari, Italy