

Isolated pendulous urethral injury following coitus: an uncommon urological emergency – a rare case report and mini review

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(Received: February 2020 Revised: March 2020 Accepted: April 2020)

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ABSTRACT

Fracture of the penis is an uncommon emergency urological condition that every urologist would come across in clinical practice. Though it classically involves a tear of Tunica albuginea, concomitant urethral rupture is observed in 10-20% cases. Rarely, isolated urethral injury without fracture of penis is encountered. Such an entity is more common after a vigorous sexual intercourse, resulting in urethral rupture without penile fracture. A 50-year-old male presented to the emergency department with a history of pain, penile swelling and bleeding per urethra following sexual intercourse. Penile Doppler revealed a tear in the tunica albuginea and was taken up for emergency exploration. On exploration, no tear was identified in the tunica albuginea of both corporal bodies. However, a defect was identified in the ventral aspect of the proximal penile urethra, which was repaired. Penile fracture is an uncommon surgical emergency. Isolated urethral injuries to the urethra without corporal involvement are even rarer. A high index of awareness and clinical suspicion are needed to diagnose such rarer emergencies and treat them appropriately. This case is presented for its rarity and to stress the need for inspection of the spongiosum in patients who present with the fracture penis.

Keywords: Urethra; hematuria; fracture; penis; coitus.

INTRODUCTION

Fracture of the penis, though uncommon, is one of the important emergency conditions that every urologist should be very familiar with. Penile fractures involve rupture of the tunica albuginea of one or both corpora cavernosa (1). Such emergencies present with an engorged penis, due to a rapidly expanding hematoma. Most cases are reported to be associated with a vigorous sexual intercourse when the penis is in a rigid erection phase. Fracture of the penis is a clinical condition that is easily diagnosed, but often under-reported as the patients feel embarrassed to reveal the real nature of incidence (2).

Concomitant urethral ruptures, though rare, are reported to be associated in 9-20% of penile fracture cases (3). Isolated urethral injury without fracture of penis is extremely rare. Only a very few of such cases are reported in literature. We report a rare case of penile trauma during sexual intercourse resulting in urethral rupture without damage to T. Albuginea. Penile Doppler was suggestive of the fracture of the edematous penis and the patient was taken up for exploration. Intra-operative findings suggested an intact corpora and a tear in the urethra and corpus spongiosum. Presence of blood at urethral meatus or hematuria should alert the treating physician about the possibility of an associated urethral injury. Most of the times diagnosis are made clinically and surgical procedures are performed without causing any further delay, obviating the need for further diagnostic investigations (4).

Our patient presented with a rapidly engorged penis following a vigorous sexual intercourse under the

influence of alcohol with typical features of fracture of penis and urethral bleed. This case reports the rarity of the condition and stresses on the need for a thorough examination of the spongiosum during exploration, to not miss out the concomitant urethral injuries. In a thorough pub-med search, this appears to be the second reported case of injury involving the pendulous urethra during coitus.

CASE REPORT

A 50-year-old male presented to the emergency department with a history of pain, penile swelling and bleeding per urethra following sexual intercourse in conventional man-on-top (Missionary) position with his wife. Local examination revealed a swollen, flaccid penis with ecchymosis and hematoma of the penile shaft (Fig 1A). There was blood noted at the urethral meatus. Penile Doppler revealed a tear in the tunica albuginea (Fig. 1B). The patient was taken up for emergency exploration.

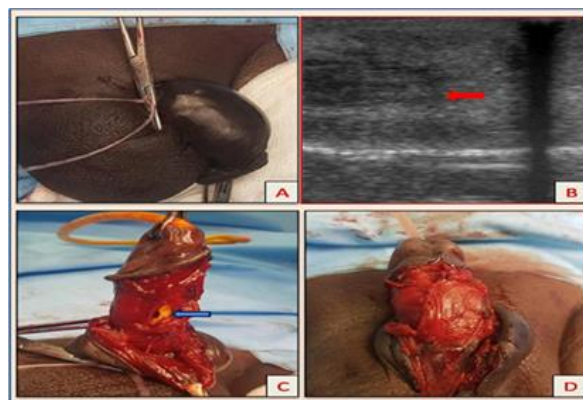


Fig. 1: A - Preop image showing swollen ecchymotic penis. B - Penile Doppler with tear in the tunica albuginea (red arrow). C- Penile degloving showing urethral rent (blue arrow). D - Darto's patch placed as water proofing second layer.

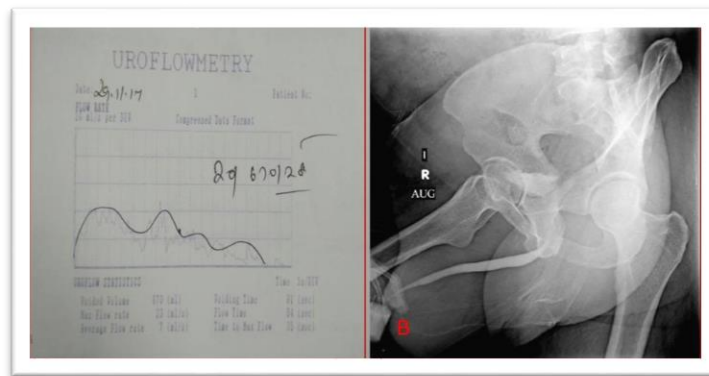


Fig. 2: A – Post-operative uroflowmetry. B – Post-operative Retrogradeurethrogram

A subcoronal circumferential incision was made and penile degloving done. On exploration, no tear was identified in the tunica albuginea of both corporal bodies. However, a defect was identified in the ventral aspect of the proximal penile urethra (Fig. 1C), which was confirmed on cystourethroscopy. The defect was repaired with continuous 4-0 monocryl sutures over a 16F Foley catheter and Dartos fascia was placed as second layer over the sutured urethra

(Fig. 1D). The redundant preputial skin was excised and circumcision completed. The wound healed well and the urethral catheter was removed after 10 days. Patient voided well post catheter removal. Uroflow was done after 6 weeks, which depicted a good flow (Fig. 2A). Retrograde urethrogram (RGU) was done 6 weeks after catheter removal, which showed a normal caliber anterior urethra (Fig. 2B).

Table 1: Summary of the overall list of isolated urethral injuries reported

Author	Published Year	No. of cases	Location of injury	Coital position
Mohapatra <i>et al.</i> ,	1990	3	Fossa Navicularis	Reverse position
De Mendonça <i>et al.</i> ,	2009	1	Fossa Navicularis	Reverse position
Patel <i>et al.</i> ,	2010	1	Peno-bulbar	Missionary position
Chiu	2015	1	Peno-bulbar	Missionary position
McArdle <i>et al.</i> ,	2017	1	Pendulous	Reverse position
Our study	2020	1	Pendulous	Missionary position

DISCUSSION

Penile fractures, though not so commonly encountered, need an emergency intervention, when diagnosed. The first ever-documented report of a penile fracture is credited to an Arab physician, Abul Kasem, in Cordoba over 1000 years ago (5). As the tunica albuginea is very thin and stretched out in an erect penis, a sudden flexion injury to the penis can cause a tear of the albuginea, resulting in fracture of the penis. Most of the times, the tunica albuginea is damaged. Urethral involvement in such cases is very rare. The overall reported incidence of urethral injury associated with injury to the corpus cavernosum is 10 to 38% (6). However, an isolated injury to the urethra, without involvement of Tunica albuginea, is even rarer.

The classic presentation of a penile fracture is a cracking sound, followed by sharp pain, detumescence, penile swelling, deformation and ecchymosis (7). If bleeding per urethral meatus or difficulty in urination occurs, concomitant urethral injury should be suspected. Isolated urethral injury without penile fracture during coitus is extremely rare. Overall, in PubMed search, we identified only 7 cases of isolated urethral injury following coitus (8-12). Mohapatra *et al.*, described three cases of fossa navicularis injury (8). In his study on the mechanisms of urethral injuries to the male urethra during

intercourse, he identified that an unusual form of sexual position, called as “Reverse Coitus” had a significantly high incidence of urethral injuries. In this unusual position, the male urethra becomes more prone to direct trauma from the symphysis pubis of the female partner. This might result in severe pain, bleeding and immediate detumescence. Mendonca reported that isolated urethral injuries are rare to be seen and may sometimes happen with a sudden detumescence without a snapping sound (9). Patel *et al.*, described such isolated urethral injuries in conventional missionary position of sexual intercourse as well (10). Chiu describes that the possible mechanisms of injury may be a result of dorsal bending due to a direct ventral force on the penis, tearing the corpus spongiosum and urethra, leaving the corpora cavernosa intact (11).

Chiu *et al.*, reported one case of isolated urethral injury of the bulbar urethra, where the injury was at the peno-bulbar junction when sexual intercourse was attempted at the Missionary position (11). None of the above-mentioned publications reported any injury to the pendulous urethra. McArdle *et al.*, reported the first case of isolated pendulous urethral injury following coitus (12). Our case report would probably be the second such case of isolated pendulous urethral injury reported so far and the first ever case of isolated pendulous urethral injury in a

missionary position to be reported in literature. Table 1 describes the list of published reports on isolated urethral injury following coitus.

While most of the reports suggest an anterior urethral injury after coitus, Cheng *et al.*, reported an unusual complication of coitus related urethral injury, where he reports an isolated urethral injury at the level of prostatic urethra with active bleeding from the prostatic fossa (13). He also suggested that such a rare entity should be borne in mind by the treating urologists when no definite cause for anterior urethral bleed is identified on exploration. However, such posterior urethral injuries during coitus are extremely rare to be seen.

Most of the cases of urethral injuries are diagnosed clinically, but a confirmation of the diagnosis is done with either a retrograde urethrogram or a Doppler Ultrasonogram of the penis. Though retrograde urethrography might demonstrate extravasation of contrast material, it is more invasive. On the other hand, Doppler Sonography is an investigation that is easy to perform, readily available at most centers, relatively non-expensive and non-invasive. However, it has its own limitations. Guler *et al.*, in their publication, observed that Sonography was associated with an increased observer dependency (14). Moreover, the presence of edema and hematoma at the corpora would obscure vision and further distort the image contrast. They also concluded that a rupture of the pendulous urethra would be very difficult to be seen with a Doppler sonography. Magnetic resonance imaging (MRI) is an excellent modality for imaging patients with penile trauma (15). The integrity of the Tunica albuginea, the extent and location of rent in tunica and injuries to the urethra and corpus spongiosum can be diagnosed with a high degree of accuracy with MRI (16-18). Because of its multi-planar capability and a better tissue contrast in the images, MRI plays a significant role in making a diagnosis in such patients (19). Kirkham, in his review paper on the role of MRI in the penis, concluded that a higher degree of pre-operative localization of the tear in tunica could help the treating surgeon to limit the extent of degloving of the penis that could considerably lessen the incidence of overall morbidity (20). Because of a higher cost, non-availability in many centers, need a prolonged duration to lie down for the MRI scan to complete (especially in acutely ill patients), MRI scan has not gained wide popularity among many practicing urologists. While MRI has a high specificity in diagnosing a tunical tear, it has a poor sensitivity and specificity in identifying a urethral injury. Sokolakis, in his 10-year study on 43 patients with penile fracture, compared the findings of pre-operative MRI imaging with intra-operative findings (21). He concluded that the overall sensitivity and specificity

in diagnosing urethral injury were 60% and 78% respectively.

Derouiche *et al.*, in one of the largest study on patients of penile fractures, observed that a proper clinical examination is the key to an accurate diagnosis. They concluded that there was no need for preoperative evaluation in the form of retrograde urethrogram or sonography to make a diagnosis of penile fracture with associated urethral injuries (22).

The tunica albuginea thickness varies from 2 mm in the flaccid state to 0.5-0.25 mm in the erect state (23). The thinned-out tunica albuginea is thus susceptible to injury. Any significant impact on the dorsum of the penis can often lead to fracture. Usually, penile fracture involves a tear occurs in only one of the corpora cavernosa and its surrounding tunica albuginea. However, the corpus spongiosum and the urethra can also be involved. Since the urethra is relatively fixed between the urogenital diaphragm and the glans, thus becoming susceptible to rupture (24).

Surgical treatment for penile fracture and/or urethral injury should be done as soon as possible, as this led to fewer complications and better outcomes (25). The key to a better outcome is a prompt diagnosis and an early, appropriate treatment.

CONCLUSION

Isolated penile urethral injury is an uncommon surgical emergency that every urologist may come across in his or her clinical practice. A high index of awareness and clinical suspicion are needed to diagnose such rarer emergencies and treat them adequately and appropriately. Physicians should be even more careful when patients present with gross hematuria or voiding difficulty after sexual intercourse, even if there are no clinical or radiological features to support their clinical assessment. A retrograde urethrogram may help us diagnose the condition, but is invasive. Doppler imaging remains the immediate gold standard evaluation for diagnosing such conditions. MRI of the penis is done for patients when Doppler is inconclusive. Early surgical exploration and repair with double reinforcement is the accepted treatment for isolated urethral injuries.

CONFLICT OF INTEREST: None.

REFERENCES

1. Jack, G. S., Garraway, I., Reznichuk, R., Rajfer, J. Current treatment options for penile fractures. *Rev Urol.* 2004; 6(3): 114-120.
2. Waseem, M., Upadhyay, R., Kapoor, R., Agyare, S. Fracture of the penis: an atypical presentation. *Int J Emerg Med.* 2013; 6(1): 32.
3. Hoag, N. A., Hennessey, K., So, A. Penile fracture with bilateral corporeal rupture and complete urethral disruption: case report and literature review. *Can Urol Assoc J.* 2011; 5(2): E23-E26.

4. Bali, R. S., Rashid, A., Mushtaque, M., Nabi, S., Thakur, S. A., Bhat, R. A. Penile fracture: experience from a third world country. *Adv Urol*. 2013; 2013: 708362.
5. Pandyan, G. V., Zaharani, A. B., Al Rashid, M. Fracture penis: an analysis of 26 cases. *Scientific World Journal*. 2006; 29 (6): 2327-2333.
6. Rahman, M. J., Faridi, M. S., Mibang, N., Singh, R. S. Penile manipulation: The most common etiology of penile fracture at our tertiary care center. *J Family Med Prim Care*. 2016; 5(2): 471-473. doi:10.4103/2249-4863.192347
7. Yunusa, B., Wullie, K., Willie, S. E., Konneh, S., Sherriff, S., Cassell, A., et al. Penile Fracture: Delayed presentation, primary urethral repair and satisfactory outcome. *Case Rep Urol*. 2019; 4 pages.
8. Mohapatra, T. P., Kumar, S. Reverse coitus: mechanism of urethral injury in male partner. *J Urol*. 1990; 144: 1467-1468.
9. De Mendonca, R. R., Bicudo, M. C., Sakuramoto, P. K., Bezerra, C. A., PompeoA, C., Wroclawski, E. R. Isolated anterior urethral trauma in man after coitus: a case report. *Einstein*. 2009; 7: 503-505.
10. Patel, A., Kolkin, L. Isolated urethral injury after coitus-related penile trauma. *J Trauma*. 2010; 68: 89-90.
11. Chiu, H. C., Chang, C. H., Hsieh, P. F. Isolated urethral rupture related to sexual intercourse in male and literature review. *Urology Journal*. 2015; 12(6): 2462-2464.
12. McArdle, B. J., Wille, M. A., Hollowell, C. M. Isolated spongy urethral rupture from abrupt coital distractive force. *J Radiol Case Rep*. 2017; 11(2): 23-27.
13. Cheng, Y. S., Lin, J. S., Lin, Y. M. Isolated posterior urethral injury: an unusual complication and presentation following male coital trauma. *Asian J Androl*. 2006 May; 8(3): 379-381.
14. Guler, I., Ödev, K., Kalkan, H., Simsek, C., Keskin, S., Kilinç, M. The value of magnetic resonance imaging in the diagnosis of penile fracture. *IntBraz J Urol*. 2015; 41(2): 325-328.
15. Murray, K. S., Gilbert, M., Ricci, L. R., Khare, N. R., Broghammer, J. Penile fracture and magnetic resonance imaging. *IntBraz J Urol*. 2012; 38: 287-288.
16. Uder, M., Gohl, D., Takahashi, M., Derouet, H., Defreyne, L., Kramann, B., et al. MRI of penile fracture: diagnosis and therapeutic follow-up. *Eur Radiol*. 2002; 12: 113-120.
17. Abolyosr, A., Moneim, A. E., Abdelatif, A. M., Abdalla, M. A., Imam, H. M. The management of penile fracture based on clinical and magnetic resonance imaging findings. *BJU Int*. 2005; 96: 373-377.
18. Suzuki, K., Shimizu, N., Kurokawa, K., Suzuki, T., Yamanaka, H. Fracture of the penis: magnetic resonance imaging of the rupture of the corpus cavernosum. *Br J Urol*. 1995; 76: 803-804.
19. Yokogi, H., Mizutami, M., Ishibe, T. Magnetic resonance imaging of a penile fracture. *Acta Urol Belg*. 1992; 60:93-95.
20. Kirkham, A. MRI of the penis. *Br J Radiol*. 2012; 85(1): S86-S93.
21. Sokolakis, I., Schubert, T., Oelschlaiger, M., Krebs, M., Gschwend, J. E., Holzapfel, K., et al. The role of magnetic resonance imaging in the diagnosis of penile fracture in Real-life emergency settings: Comparative analysis with intraoperative findings. *J Urol*. 2019; 202(3): 552-557.
22. Derouiche, A., Belhaj, K., Hentati, H., Hafsia, G., Slama, M. R., Chebil, M. Management of penile fractures complicated by urethral rupture. *Int J Impot Res*. 2008; 20(1): 111-114.
23. Tsang, T., Demby, A. M. Penile fracture with urethral injury. *J Urol*. 1992; 147(2): 466-468.
24. Brotzman, G. L. Penile fracture. *J Am Board Fam Pract*. 1991; 4: 351-353.
25. Biserte, J., Nivet, J. Trauma to the anterior urethra: diagnosis and treatment. *Ann Urol* 2006; 40: 220-232.