

Non sex-related subtotal rupture of the corpus cavernosum without urethral injury: A case report and literature review

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DISCUSSION

Penile fracture is an uncommon presentation to Urology Departments with an incidence of 1 in 175.000 (3). Nevertheless it is a well-known urological emergency since centuries. The first cases of penile fracture was reported by *Abul Kasem an Arab physician in Cordoba*, over 1000 years ago (4).

Penile fractures can be diagnosed from a history and physical examination because of its findings are typically (5). The patients report an audible 'popping' sound, rapid detumescence and penile pain. There are 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 (6). So, only a history and physical examination can be enough for diagnosis. But diagnosis is straightforward when classical historical and physical examination findings are present. However, atypical presentations can make the diagnosis difficult. For that reason, there is still controversy about the need for a preoperative evaluation with cavernosography, retrograde urethrography, magnetic resonance imaging, and cysto-urethroscopy (2) although these invasive tests are not necessary in most cases because ultrasound is sufficient. Ultrasound is a simple, efficient, and non-invasive imaging method to assist in the diagnosis of penile fracture (7) that can be diagnosed by ultrasound in 86 % of cases (8). Retrograde urethrography is a valuable tool to evaluate urethral injuries. Magnetic resonance imaging (MRI) can be useful in assessing penile fracture but its use are limited because of cost (9). Though soft tissue details in multiple planes are best shown by MRI, from a practical aspect, USG scores over MRI in terms of cost, availability and time consumed for the procedure (7). False diagnosis rate mimicking penile fracture is 4-10% (9). The most common cause that mimic penile fracture is dorsal penile artery and vein injury (5, 10, 11). In this cases cavernosography can be necessary for the differential diagnosis (10).

Penile fracture may occur as a result of sexual intercourse or some manual manipulations. In a meta-analysis with 1,948 cases examined in 58 studies, the causes of penile fracture were as follows (rate, case number): sexual intercourse 46% (908), forced flexion 21% (403), masturbation 18% (345), rolling over 8.2% (159), non-assessable 3.3% (61), blunt trauma 3% (58), others 0.7% (14) (12). Interestingly, etiological causes of penile fracture vary according to regions. For example, 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 (6). Against it, in Middle East countries, a common cause of penile fracture is self-inflicted injury. This is a practice termed '*taghaandan/taqnaadan*' and occurs when the erect penis is bent or struck to achieve rapid detumescence (13, 14). The most prevalent example of this practise (*taqnaadan*) is one Iranian study where 269 of 352 (76%) patients suffered a penile fracture in the process (15). Urethral injury (partial or complete rupture) may also accompany in penile fracture. According to the meta-analysis of *Amer et al.*, urethral bleeding rate was 5.6%, urethral injury rate was 6.1% (12). This condition showed that hematuria is highly indicative of urethral rupture. Thus, many studies argued that there is no need to urethrography for urethral injury recommending when the absence of clinical sings such as urinary symptoms or hematuria (16-19). Nevertheless some studies suggested routinely flexible ureteroscopy before urethral catheterization in the operating room (2).

In this case that we presented, there was a subtotal rupture of the right corpus cavernosum. But even so, there was no urethral injury. The reason for this may be the development of penile fracture depending on manual manipulation (no sexual intercourse). This was a penis fracture with low-energy nature. According to literature data, urethral injury rate is higher in the penis fracture with low-energy than high-energy penis fracture. The incidence of urethral injury is 3% in the Eastern world, mostly due to its low-energy nature (13), but this proportion rises to 38% in European countries and the USA, because penile fractures are often a result of high-energy injuries (20). There are other literature data supporting this condition. For example, in a review of 183 reports, a total of 1331 penile fracture cases were found between the years 1935 and 2001. Most cases were caused by direct blunt trauma to the erect penis during sexual intercourse in the Western world, whereas manual manipulations at masturbation or kneading the penis to achieve detumescence were the most frequent causes in Middle Eastern countries (1). Nevertheless complete urethral rupture is rare and it is almost always associated with bilateral corporeal injury. Urethral rupture is usually partial, rarely complete. Complete urethral rupture and disruption of both corpora is rare in the literature (16-19). The treatment of penile fracture can be conservative or

surgical. Conservative treatments have included compression bandages, ice packs, fibrinolytics, anti-inflammatories, sedatives and anti-androgens (5, 6). 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 (21, 22).

Early surgical measures involve repair of the torn tunica after haematoma removal and this has been proven to be better than conservative measures (5, 23). This reduces the chance of angulation deformity that can occur if fibrous plaque is formed due to delay in surgery. In the earlier reports, conservative methods such as cold applications, anti-inflammatory drugs and suppression of erection have been preferred for the treatment of penile fractures. However, early surgical repair of corpus cavernosum is the gold standard since it decreases the complication rates (24). A systematic review has confirmed that overall early surgery also results in significantly fewer complications versus delayed surgery ($p < 0.00001$). Rates of penile curvature are also significantly lower in patients having emergent rather than delayed surgery in this meta-analysis ($p = 0.0004$) (12). Our results in this case are also consistent with the literature data on the early surgical treatment on penile fracture.

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