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Penile fracture: Four case series report from a single institute

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Abstract

Introduction: Fracture of the penis is not a rare condition, as the sporadic reports of penile fracture give the impression of rare trauma. Penile fracture is rupture of one or both of the tunica albuginea, the fibrous coverings that envelop the penile corpora cavernosa, with a resultant corporal defect caused by trauma to the erect penis. In our study, we analysed different aspects of penile fractures, including different modes of occurrence and presentation. Our study also addressed the management and outcomes of penile fracture, with special reference to the preservation of sexual function.

Materials and Methods: This was a prospective observational study extending from January 2015 to December 2015, All patients admitted for blunt trauma to the erect penis were included in the study. During this period, 4 cases of penile fracture were treated in our institute. Each patient underwent a thorough clinical evaluation and received proper treatment. Penile fracture was mainly diagnosed on clinical grounds, based on a proper history and clinical examination. All the patients were managed by surgical exploration. Circumcoronal incision followed by degloving was done. Evacuation of the haematoma and repair of the tunical tear with absorbable sutures was done. All patients were catheterised before exploration. Minimum follow up was for 3 months. All patients were locally examined for wound-related complication, penile deviation, fibrotic scarring, skin necrosis or other related complications. Patients' sexual function was also evaluated. Both married and unmarried patients with a partner were evaluated.

Results: We treated all patients surgically. Mean age of presentation was 35.25 years. Vaginal intercourse was most common mode of injury. Patients presented in a mean time of 7 hours. Tunical defect was palpable clinically in two cases. Intra-operatively 3 patients had unilateral injury and one had bilateral injury. Right side was more commonly involved and mid-shaft was the most common site. There was one iatrogenic urethral injury. 3 patients had catheter removal after 48 hours and in one patient after 7 days. Post-operatively, one patient had mild wound infection and one had distal skin necrosis. All patients were followed at 2 weeks, one month and 3 months. At 3 months, only one patient had mild erectile dysfunction.

Conclusion: Penile fracture is a urological emergency, should be managed promptly. Diagnosis is usually clinical and surgery is the treatment of choice.

Keywords: Penile fracture, penile trauma, coital injury

1. Introduction

Fracture of the penis is not a rare condition, as the sporadic reports of penile fracture give the impression of rare trauma^[1]. The fracture is easy to recognise but timely reporting by the patient is important to get the appropriate treatment. Penile fracture is rupture of one or both of the tunica albuginea, the fibrous coverings that envelop the penile corpora cavernosa, with a resultant corporal defect caused by trauma to the erect penis. The usual cause is abrupt bending of the erect penis by blunt trauma, which may occur during overzealous sexual intercourse, masturbation, rolling over on the bed, or falling onto the erect penis. Commonly during vaginal intercourse patient's penis hits the partner's perineum or pubic symphysis. The presentation of penile fracture may vary depending upon the time interval between occurrence and treatment and on the presence of associated injuries. Delay in presentation is mainly due to fear and embarrassment. The patient hears a pop up or a click sound, followed by rapid detumescence of the erect penis and intense local pain. This is followed by hematoma, bruising, and deviation of penis. The characteristic deformity is known as 'eggplant deformity'^[2,3].

A tunical defect is usually palpable but sometimes due to massive hematoma it is not felt. Urethral or corpora spongiosum injury can be associated with fracture penis. The incidence of urethral injury is significantly higher in the USA and Europe (20%) than in Asia, the Middle East, and the Mediterranean region (3%) [3-7].

The diagnosis of this condition is usually clinical, based on high clinical suspicion and proper history taking and examination. However, novel imaging techniques like ultrasonography (USG) [8], retrograde urethrography (RGU) [2, 9], and the MRI help confirm the proper diagnosis when a diagnostic dilemma occurs [7]. Penile fracture is managed primarily by surgical exploration, removal of the hematoma, identification of the tunical defect and repair of the defect. Penile curvature, erectile dysfunction, priapism, urethral stricture, urethra-cutaneous fistula, penile skin necrosis etc. are some of the important complications that can occur either after surgical repair or if patient is managed conservatively. The incidence of complication is more if patient is managed conservatively.

In our study, we analysed different aspects of penile fractures, including different modes of occurrence and presentation. Our study also addressed the management and outcomes of penile fracture, with special reference to the preservation of sexual function.

2. Materials and Methods

This was a prospective observational study extending from January 2015 to December 2015, All patients admitted for blunt trauma to the erect penis were included in the study. During this period, 4 cases of penile fracture were treated in our institute. Each patient underwent a thorough clinical evaluation and received proper treatment. Penile fracture was mainly diagnosed on clinical grounds, based on a proper history and clinical examination. All the patients were managed by surgical exploration. Circumcoronal incision followed by degloving was done. Evacuation of the haematoma and repair of the tunical tear with absorbable sutures was done. All patients were catheterised before exploration. Minimum follow up was for 3 months. All patients were locally examined for wound-related complication, penile deviation, fibrotic scarring, skin necrosis or other related complications. Patients' sexual function was also evaluated. Both married and unmarried patients with a partner were evaluated.



Fig 1: Characteristic deformity after Penile fracture

3. Results

There were 4 patients in the study that were included and followed. The patients were between 21-50 years of age. Youngest patient was 22 years old and oldest was 46 years

of age. The mean age being 35.25years (Table 1). Of the 4 patients, 3 (75%) were married and only one (25%) patient was unmarried (Table 2). The most common mechanism of injury was vaginal intercourse (75%). Manipulation of penis during masturbation (25%) accounted for the other mechanism of injury (Table 3). The injury occurred between 8 PM and 9 AM next morning. Among these two injuries occurred at night and two in the morning hours (Table 4). The mean time of presentation to the hospital was 7 hours.

Table 1

Age (yrs)	
21-30	1 ((25)
31-40	2 (50)
41-50	1 (25)

Table 2

Marital status	
Married	3 (75)
Unmarried	1 (25)

Table 3

Mechanism of injury	
Vaginal intercourse	3 (75)
Masturbation	1 (25)

Table 4

Time interval from injury to presentation	
Patient 1.	10 hours
Patient 2.	2 hours
Patient 3.	4 hours
Patient 4.	12 hours

Values presented in bracket are percentage (%).

In all the cases, the patients came in the emergency department with clinical presentation involving pop-up sound (during intercourse/masturbation) followed by pain, rapid detumescence, development of swelling and discoloration and deviation of penis to one side. None of the patients had bleeding per urethra. The tunical defect was palpable in only two of the patients. In other two because of hematoma the defect could not be palpated.

The diagnosis was made on clinical grounds in all the cases. Radiological investigations were not done. All patients were surgically explored. Right corporeal tear was present in 2 cases, left side in one patient and bilateral tear was present in one patient. Mid-shaft injury was present in 3 patients and proximal shaft was involved in one patient only (Table 5). In one patient there was intra-operative iatrogenic urethral injury, which was closed with absorbable suture immediately over 16 Fr Foley's catheter. The repair of the tunical defect was performed with absorbable sutures in all the cases. A circumcoronal degloving incision was used.

Table 5: Intra-operative findings

i) Side of tunical defect	
Right	2 (50)
Left	1 (25)
Bilateral	1 (25)
ii) Site of injury	
Mid-shaft	3 (75)
Proximal shaft	1 (25)



Fig 2: Evacuation of hematoma after circumcoronal degloving incision

Post-operatively, one patient had mild wound infection and one patient had skin necrosis (Table 6). Both were managed conservatively. Catheter was removed after 48 hours in 3 patients and in the patient with iatrogenic urethral injury catheter was removed after 7 days. All the patients were followed at 2 weeks, one month and 3 months. On follow-up at 2nd week, visible scar, wound infection and skin necrosis resolved. No patient had penile deviation. At one month and 3 month follow up one patient had mild erectile dysfunction that was resolved with oral PDE-5 inhibitors (Table 7).

Table 6

Complications	
Intra-operative	
urethral injury	1 (25)
Post-operative	
Mild wound infection	1 (25)
Distal skin necrosis	1 (25)

Catheter removal	
After 48 hours	3 (75)
After 7 days	1 (25)

Table 7: Follow up after surgical repair

Clinical examination	
Visible scar	2 (50)
Penile deviation	0

Evaluation of erectile function	
None	3 (75)
Mild	1 (25)

Values presented in bracket are percentage (%).



Fig 3: Same patient as in figure 1 – Post-operative appearance

4. Discussion

Surgical repair of penile fractures was popularized in the 1980s after several studies demonstrated that long-term complications were reduced from 30% to 4% in surgically treated patients [10-12]. The current literature advocates immediate surgical repair upon presentation to the hospital. The usual cause of penile fracture is abrupt bending of the erect penis by blunt trauma, which may occur during sexual intercourse, masturbation, rolling over in the bed. Tunica albuginea ruptures due to its marked thinning (0.25–0.5 mm) during erection from a resting thickness of 2 mm along with simultaneous marked short-term pressure increase which approaches or exceeds the tensile strength of the tunica during acute abrupt bending of the erect penis. The mean arterial pressure of corpus cavernosum during erection is 100 mmHg. When the tunica is ruptured, mean arterial pressure of corpus cavernosum is 1500 mmHg or more. This overcomes the tensile strength of the tunica and fracture occurs [13].

The cause of penile fracture in our study was similar to other published studies with vaginal intercourse being the most common cause [1, 14-16]. In our study most of the patients were injured in the late night and early morning, which may reflect the circadian rhythm of testosterone secretion.

The age of presentation varied from 22-46 years in our study. In study by Ishikawa T *et al.* the minimum age of presentation was 15 years and age varied upto 55 years [1]. De Giorgi G *et al.* studied 10 patients between 23-42 years of age [14]. Mydlo JH *et al.* had patients from 18-38 years old in their study [16].

The time interval from injury to presentation varied from 2-12 hours in our study. De Giorgi G *et al.* reported 1-10 hours reporting time [14]. Ishikawa T *et al.* reported that the patients came 2-23 hours after the injury occurred [1]. Mydlo JH *et al.* reported 6-72 hours as the time of patient presentation [16].

In our study, 3 patients were married and one patient was unmarried. R K Sinha Mahapatra *et al.* had 15 married and 5 unmarried patients in their series [17].

The diagnosis of penile fracture can be made through proper history and clinical examination. In our study, all patients were diagnosed on history and clinical examination. Radiological investigation were not done to confirm the diagnosis. However, recently various studies have done defining the diagnostic role of USG [4, 6, 8, 18], cavernosography [6, 19], RGU [2, 9], and magnetic resonance imaging [9, 20].

Penile fracture is primarily managed surgically by immediate exploration. The surgical repair of penile fracture was first described by Fetter and Gartmen [21] in 1936 and became more popular in the 1980s [7], after several studies demonstrated that the rate of long-term complications was reduced from 30% to 4% in surgically treated patients [6]. Multiple contemporary publications have confirmed that suspected penile fractures should be promptly explored and surgically repaired. In our study, we managed all patients by surgical exploration. However, there are studies in which patients were managed conservatively. Muentener *et al.* [22] compared surgical and conservative treatment strategies and reported success rates of 92% and 59%, respectively. Yapanoglu *et al.* [23] and Gamal *et al.* [24], in two similar studies, found that immediate surgical repair resulted in good outcomes and was superior to conservative treatment.

Mydhlo JH treated 29 patients surgically and managed 5 patients conservatively [16].

In our study, we used circumcoronal degloving incision for surgical exploration in all the cases as our standard approach. Ishikawa T *et al.* and Mydhlo JH also advocated the same [1, 16]. However, some authors have used small lateral incisions for localized haematomas or palpable tunical defects [17, 25]. In addition to being the most cosmetically favourable type of incision, a circumcoronal degloving incision readily allows exposure to the entire tunica bilaterally, facilitating the diagnosis and repair of coexisting urethral and contralateral injuries [26].

The decision to place a Foley catheter is operator-dependent. We, in our study, catheterised all patients as standard protocol. Some surgeons have reported routinely catheterizing their patients overnight, whereas others have advocated using a urethral catheter only when injuries are close to the urethra [5, 6, 9, 16]. The use of a catheter helps the intraoperative dissection without harming the urethra, facilitates the application of a pressure dressing, prevents postoperative wound contamination, and is unlikely to be harmful. However, in our study we had one iatrogenic small urethral injury that was repaired immediately and one patient had wound infection that was managed conservatively.

Wide mobilization of the foreskin may place the distal prepuce at risk for ischemia [3]. In our study one patient had distal skin necrosis, although he was circumscribed. R K Mahapatra *et al.* found distal skin necrosis in two cases where a distal degloving incision was made but circumcision was not performed [17].

In our study we used diazepam post-operatively to prevent erections. However, a lack of consensus exists regarding the need for postoperative suppression of penile erection with diazepam. This approach has been routinely used in some studies, but declared to be unnecessary in others [27].

The immediate postoperative outcomes vary in different case series. In our series of 4 patients, 2 patients were discharged on the fifth postoperative day, with the exception of 2 patients who developed complications. One had mild wound infection and other had distal skin necrosis. Both were managed conservatively and discharged between the 7th and 10th postoperative day. Catheter was removed after 48 hours in three patients and after 7 days in one patient who had iatrogenic urethral injury.

Different studies follow different protocol for follow up. In our study all the patients were followed at 2 weeks, one month and 3 months. On follow-up at 2nd week, visible scar, wound infection and skin necrosis resolved. No patient had penile deviation. At one month and 3 month follow up one patient had mild erectile dysfunction that was resolved with oral PDE-5 inhibitors. A study performed by Nane I *et al.* [28], evaluating the long-term erectile status of patients in whom penile fracture was immediately repaired, noted ED in eight out of 36 patients after a mean follow-up period of 3.6±1.9 years. ED in the above patients was due to cavernosal and/or penile arterial insufficiency. Other reported complications include urethral stricture, urethra cavernosal fistulae [4], urethrocuteaneous fistula [29]. However, our study does not report any such complications.

5. Conclusion

Penile fracture is a urological emergency, should be managed promptly. Diagnosis is usually clinical and surgery is the treatment of choice.

The limitation of our study is small numbers of patients with relatively short follow-up period. Studies with larger number of patients and a longer follow-up to detect long term sequelae of fracture penis are recommended.

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