



Outcome of Penile Fracture Repair – Our Experience

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Abstract

Introduction: Penile fracture is an uncommon urological emergency, best managed by early surgical intervention, but the data on subsequent sexual function is sparse. This study was designed to analyse the clinical spectrum and sexual function after penile fracture repair in Urology Department of BIRDEM General Hospital and other institutes in Dhaka, Bangladesh which were attended by the authors.

Materials and Methods: This is a prospective observational study extending from January 2013 to November 2024, which included all the patients admitted with the diagnosis of fracture penis. The clinical presentation, aetiology and the details of the surgical management were noted. Patients were followed up for 36 months. They were evaluated for the presence of penile nodules or curvature, and the erectile function was objectively recorded using the Sexual Health Inventory for Men (SHIM) questionnaire and the Erection Hardness Score (EHS).

Results: During the study, 22 cases of penile fracture received treatment. Median age at injury was 29 years, and injury due to rolling over the erect penis during morning tumescence (12/22) was the most common aetiology. Ultrasound was performed in 20 patients and could detect the injury with an 80% sensitivity. All cases were repaired through a subcoronal degloving incision. Patients were followed up 6 monthly for 36 months. Of the 22 patients, 18 were sexually active. The mean SHIM score was 21.36 ± 1.33 and the mean EHS was 3.21 ± 0.43 . Three of the 22 patients developed penile nodule. One of them had penile curvature which was not bothersome.

Keywords: Penile fracture, outcomes of penile fracture, erectile problem after penile fracture, repair of penile fracture.

Conclusion: Penile fracture remains primarily a clinical diagnosis. Although prompt diagnosis and an emergent surgical exploration provides good outcomes in terms of preservation of erectile function, patients should be apprised about the problems of penile nodule and curvature.

Introduction

Penile fracture, although a misnomer, refers to the disruption of tunica albuginea with rupture of the corpora cavernosa of the penis, usually in an erect state, resulting in sudden detumescence. The reported incidence of this entity is 1 in 175,000.^[1] The fracture penis most commonly results from injury during the

sexual intercourse or masturbation and from rolling over the erect penis on the bed and from falling onto the erect penis.^{1,2} All these result in an abnormal bending of the erect penis.

Typically, the patient hears a “click” that is followed by collapse of the erection with intense local pain and

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the formation of a hematoma with a characteristic “eggplant deformity” (blue discoloration and oedema of the penis, with bending of the penis to one side). There is a palpable tunical defect and the tear can be identified in a clinical examination by means of a “rolling sign.” A “rolling sign” results from a clot trapped in a well localized position under Buck’s fascia, which is felt as a discrete, smooth, fixed, tender, firm lump at the ‘fracture’ site over which the penile skin may be rolled. These characteristics are considered pathognomonic.^[3,4] Patients may present late due to fear and embarrassment and this delay may result in long term cosmetic and functional impairment. Fracture penis is one of the few urological emergencies, managed best by early surgical intervention. The data on the use of imaging, subsequent erectile function, and the development of penile plaque are sparse.

We report the clinical presentation, aetiology, surgical management, sexual function and complications in patients with penile fracture presenting to BIRDEM General Hospital and other institutes in Dhaka, Bangladesh which were attended by the authors.

Materials and methods

This is a prospective observational study extending from January 2013 to November 2024, which included all the patients admitted with the diagnosis of fracture penis. Data were retrieved from the patient presented with penile fracture in this period in Urology Department of BIRDEM General Hospital and other institutes in Dhaka, Bangladesh which were attended by the authors. The demographic profile, mode of injury, clinical presentation, and the imaging findings were recorded. The intraoperative findings and the method of repair were scrutinized. Patients were contacted telephonically and were asked to visit the outpatient department for clinical evaluation and evaluation of their sexual health. On the follow up visits, they were clinically evaluated for sexual health. The erectile function was objectively recorded using the Sexual Health Inventory for Men (SHIM) questionnaire,^[5] (also known as the International Index of Erectile Function [IIEF 5]). The erectile dysfunction (ED) severity was classified as: none (22–25), mild (17–21), mild to moderate (12–16), moderate (8–11), and severe (5–7). Concomitantly, Erection Hardness Score (EHS)^[6] was used to stratify the quality of erections after the repair. The patients were also asked about any complications and were examined to identify nodules/ plaque or curvature. Statistical analysis was

performed using Microsoft excel 2010 Descriptive statistics were applied, and values were presented as mean (standard deviation) and median (range).

Results

During the study, 22 cases of suspected penile fracture received treatment. Each patient underwent a thorough clinical evaluation and received urgent surgical intervention. The diagnosis was based on clinical grounds after thorough history and physical examination. Ultrasonography (USG) was performed in 20 patients. Immediate surgical exploration was carried out in all cases.

Median age at presentation was 29 (range 18–65) years. Injury during the sexual intercourse occurred in six patients (27%). 12/22 (55%) patients had the penile fracture from due to rolling over the erect penis during morning tumescence, while 3/22 (14%) sustained the injury during masturbation. One patient (4%) was riding a motorcycle when he met with an accident and the semi erect penis hit the handle of the motorcycle.

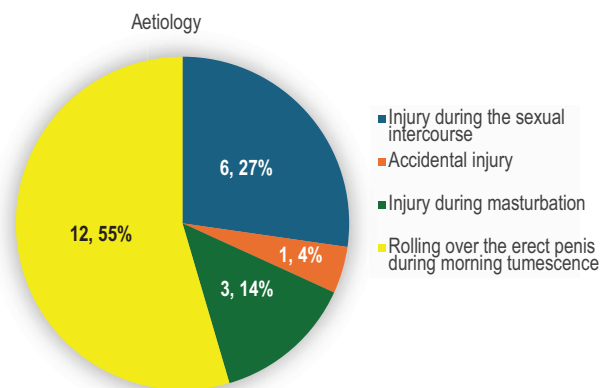


Figure 1: Aetiology of penile fracture of the study patients.

The interval from injury to presentation ranged from 6 to 120 hours. However, the majority (13/22, 59%) of the patients presented within 24 h of injury. Eighteen patients (82%) presented with an eggplant deformity with diffuse ecchymosis of the penis, while 4/22 (18%) of the patients presented with a localized hematoma. 16/22 (73%) patients reported a pop sound and a sudden detumescence of the erect penis followed by a localized hematoma or the classical egg plant deformity. Ultrasound was performed in 20 patients and in 16/20 (80%) was able to delineate the tunical defect. Patients were explored in an emergency setting

under either general or regional anaesthesia. The median size of the defect was 1.4 cm (range = 0.8-1.4). Eighteen patients (81.8%) had the injury on the ventrolateral aspect of the cavernosa while 4 patients had a tear on the dorsal aspect. All cases were repaired through a subcoronal degloving incision. The tunical defects were repaired with 4-0 vicryl sutures.

Patients were followed up 6 monthly for 36 months. Out of 22 patients, 18 patients were sexually active and 4 were inactive. The reasons for sexual inactivity were as follows: three patients had no active sexual partner, and one patient complained of ED and cited it as the cause for sexual inactivity. Average time to return to sexual activity was 5.6 months. The mean SHIM score was 21.36 ± 1.33 and the average EHS was 3.21 ± 0.43 . One patient had moderate ED (SHIM 8-11), four patients had mild ED (SHIM 17-21) and others had no ED. Eighteen patients (81.8%) had the EHS of 4 and three patients (13.6%) had the EHS of 3 and one patient (4.5%) had EHS of 2. One patient complained of penile curvature on erection which was $<20^\circ$ (measured using a clinometer in erect penis after the administration of sildenafil 50 mg along with visual stimuli) and did not affect penetration during sexual intercourse. On examination, 3 out of 22 patients (4.5%) were found to

have penile nodules which were small measuring 5-6 mm and felt like suture granulomas. None of the patients had Peyronie's plaque or had difficulty during intercourse due to the nodules.



Figure 2: Fracture of penis with swelling and discoloration (aubergine sign/eggplant deformity).

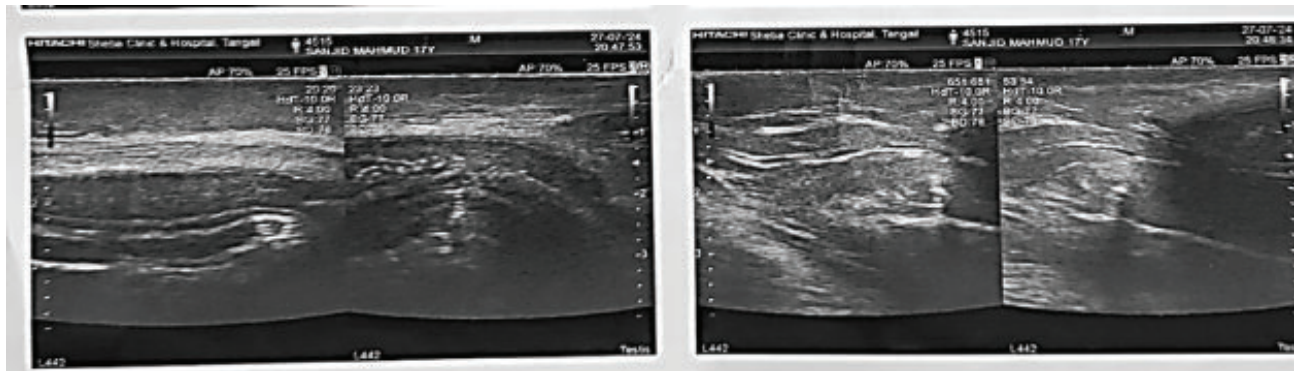


Fig.-3: Ultrasound of penis showing tear at tunica albuginea with haematoma formation near root of the penis

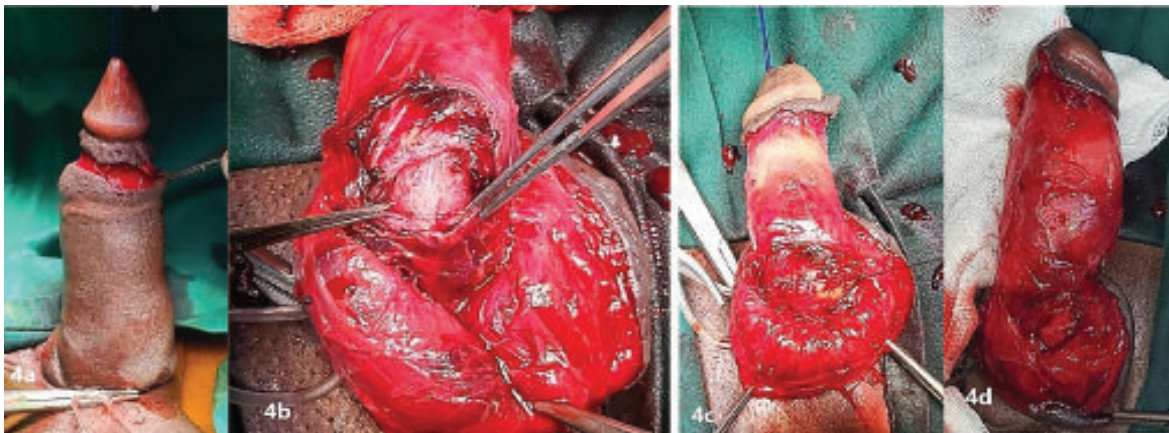


Fig.-4: Repair of penile fracture. a) Distal circumferential incision after applying tourniquet at root of penis. b) Exploration of site of tear. c) & d) repairing of the tear.

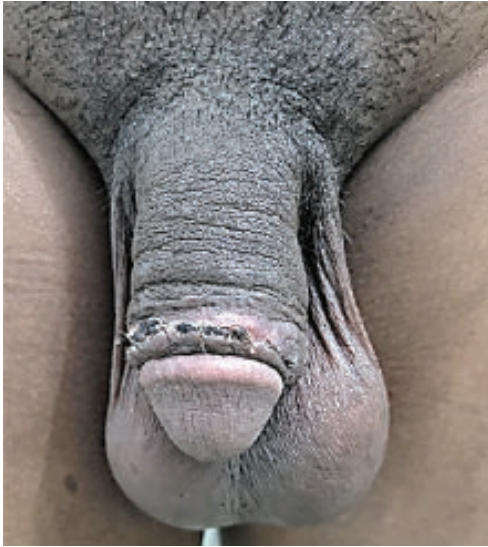


Fig.-5: Outcome 2 weeks after repair.

Discussion

Abu al Qasim al Zahrawi, an Arab physician, was the first to document a case of penile fracture more than 1000 years ago.^{1,2} Malis and Zur in 1924 described the first case of fracture penis noted in the modern medical literature.³ Penile fracture, once a rare urological emergency, has lately become a frequent presentation in the emergency room and involves the rupture of tunica albuginea and the underlying corpora cavernosa of an erect penis due to an external bending force. In our study, we found 22 cases between January 2013 to November 2024. Tunica albuginea thins out (0.25–0.5 mm, as compared to a resting thickness of 2 mm) during erection and ruptures due to a marked short term increase in intra cavernosal pressure which approaches or exceeds the tensile strength of the tunica.⁴ Fracture penis is usually caused by abrupt bending of the erect penis due to trauma. The most commonly encountered causes include sexual intercourse, masturbation, and rolling over in the bed over the erect penis.^{1,6} The meta analysis by Amer et al. found sexual intercourse as cause of fracture penis in 46% of the patients followed by forced flexion (21%) and masturbation (18%) in a pooled data of over 3000 patients.⁷ The aetiology of trauma has been differently reported from various regions. Trauma sustained during sexual intercourse is reported as the main cause of penile injury in America; manipulating the erect penis (a practice known as “taghaandan”) to achieve detumescence is reported as a major cause in the Middle East,^{8,9} whereas rolling over an erect penis in

bed and masturbation are the most common causes in Japan.¹⁰⁻¹² In our series, the most common cause was (55%), due to rolling over the erect penis during morning tumescence. This deviation of aetiology from most of the study may demand further social and psychological study of the patients. Mahapatra et al. have attributed this timing of fracture to the circadian rhythm of testosterone which may or may not be the case.^[13] The diagnosis is usually made by a thorough clinical history and a good clinical evaluation. 16/22 (73%) patients reported a pop sound and a sudden detumescence. 82% percent of the patients in our series presented with an eggplant deformity with diffuse ecchymosis of the penis while 18% of the patients presented with a localized hematoma.

USG of the penis is the most performed investigation, and it can reveal the defect in tunica albuginea if performed by an experienced radiologist.^{14,15} In our series, the USG had a sensitivity of 80%. USG is primarily being used as a tool to prevent medicolegal hassles. Another probable reason for obtaining an USG as a routine is to avoid unnecessary surgery and its consequences. However, based on these data, we do not advocate use of USG as a method of preoperative diagnosis as it may miss almost 20% of the cases. A penile Doppler may be helpful in picking up the diagnosis of thrombosis of dorsal vein and vessel injury, however a normal penile Doppler does not rule out penile fracture. This poor sensitivity can result from various reasons: cursory examination in a busy emergency setup, obscuring of the defect by the hematoma and at times being performed by an ultrasonologist with limited experience.¹⁶ The European Association of Urology (EAU) Guidelines state that MRI is superior to USG in determining the defect size and location. However, the cost and availability restrict its use in routine practice.¹⁷

In one study, the defect in tunica is usually transverse and 1–2 cm in length.¹⁸ Fracture is usually unilateral, although tears in both the corporeal bodies occur in 10% of the injuries.¹⁹ Bilateral corporeal injuries are more commonly associated with urethral injury.¹³ Most of the penile fractures are located distal to the suspensory ligament, and majority of the coital injuries are located ventrolateral aspect,²⁰ where the tunica albuginea is the thinnest.²¹ In our series, ventrolateral corpora was injured in eighteen patients (81.8%), while in 4, the tear was present on the dorsolateral side.

In the meta analysis by Amer et al., it has been reported that an associated urethral injury should be suspected

in patients with gross haematuria, microscopic haematuria or who are unable to micturate.¹ The meta analysis reported the incidence of urethral injury with penile fracture at 6.1%. In our study, no patient suffered from the urethral injury. Derouiche et al. have reported the use of suprapubic catheter in patients with urethral injury.²²

The treatment of penile fracture has undergone a paradigm shift over the decades with earlier reports recommending conservative management with bed rest, pressure dressings, use of ice packs and prolonged catheterization along with antibiotics, fibrinolytics, oestrogens, and diazepam for suppressing the erections.²³ Such treatments, though in vogue for a long time, often had disastrous results. Such a conservative treatment may result in erectile dysfunction, penile deformities, and consequential suboptimal coitus in 10%–30% of the patients.²⁴ The review by Kalash and Young and Hinev et al. recommended immediate surgical repair of all the cases of penile fracture as this provides a chance for complete recovery, even in the presence of a concomitant urethral injury.¹⁸ Emergent repair was undertaken in all cases in our series, which is now considered the best method for managing the fracture penis.^{25,26}

The incision used for repair of the fracture is variable and is surgeon dependent. Distal circumcoronal degloving incision is the most used incision, although occasionally a small lateral incision may be useful for small palpable defects.^{27,28} The degloving incision allows for exposure of both the corporal bodies and the spongiosum for ready diagnosis and management of the concomitant urethral injuries. At the same time, it preserves the cosmesis of the penile skin.^{29,30} We operated all patients with a circumcoronal degloving incision. EAU recommends early repair of penile fracture with the closure of defect in tunica albuginea by either the degloving or the longitudinal incision.^{31,32}

Different authors have reported different follow up protocols. We followed up the patients 6 monthly for 36 months. The average time to return to sexual activity was 5.6 months. The mean SHIM score was 21.36 ± 1.33 and the average EHS was 3.21 ± 0.43 . One patient had moderate ED (SHIM 8-11), four patients had mild ED (SHIM 17-21) and others had no ED. 3/22 (4.5%) patients developed penile nodule, while one patient complained of curvature (<20 degrees) although both the problems were not found to be bothersome. Common causes of ED after fracture penis are

cavernosal arterial insufficiency and veno-occlusive dysfunction.³³ In a personal series of 170 patients Zargooshi reported that the early repair of fracture penis results in erectile function comparable to that of the control population.²⁵ Acikgoz et al. found no statistically significant difference in patients operated within 24 h or after 24 h (Median IIEF 5 score of 22.65 in the 17 patients who were operated more than 24 h after the injury versus 23.78 of the 39 patients who were managed surgically within 24 h of the incident).²⁶ Interestingly, they also found that 2 patients who were not operated in their series also did not develop ED, penile curvature or penile nodule. Other complications in neglected cases may include urethral cavernosal fistulae and stricture urethra.³² In our series, none of the patients developed urethral strictures or fistulae. However, follow up protocols need to be standardized to detect these complications at the earliest. The limitations of our study include attrition of patients and cross sectional follow up.

Conclusion

Penile fracture is truly a urological emergency, and the diagnosis primarily remains clinical. Prompt diagnosis and an emergent surgical exploration provide good outcomes in terms of preservation of the sexual function. Long term problems of penile nodule/plaque and curvatures should be discussed with the patient, and they should be counselled regarding the same.

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