



Penile fracture: a case series of 18 patients

Yohannis D. Molla, MD^{a,*}, Belay A. Erku, MD^a, Samrawit A. Kassa, MD^a, Hirut T. Alemu, MD^b, Desyibelew C. Mekonnen, MD^a

Introduction: Penile fractures are a rare urological emergency. It is defined as ‘rupture of the tunica albuginea of one or both corpora cavernosa. The corpus spongiosum and the urethra may also be involved in this process.’ The tunica albuginea is stiff and significantly thinner during erection than in the flaccid state, which is when injury generally happens.

Method: This case series was completed between January 2018 and January 2023 at the Department of General Surgery. Eighteen patients suspected of having penile fractures participated in were included this study. All patients were thoroughly evaluated upon hospital admission to identify the diagnosis, length of time since the accident, the site of the fracture, the extent of the penile hematoma, occurrence of blood at the external meatus, presence of urine retention, and intraoperative outcomes.

Results: The patients were between the ages of 24 and 70, with a mean age of 37. The duration before the presentation ranged from 7 h to 1 month (the median was 22 h). Sexual intercourse was the cause in 12 (66%) cases, rolling in the bed in three cases (16%), and blunt trauma in three cases (kicking and the edge of the bed) (16%). Pain and swelling were present in all of the patients. In 15 patients (or 83%), there was evidence of penile deviation. At presentation, 15 (72%) patients reported experiencing rapid detumescence, discomfort, and penile swelling after hearing a cracking (popping) sound. None of these individuals experienced urine retention or urethral hemorrhage, and all were emptied on their own following the episode. Physical examination showed penile ecchymosis, swelling, and substantial discomfort when the penile shaft was examined. All but three patients had an evident penile deformity. Surgery was performed under spinal anesthesia in 14 (77.7%) patients. Four patients with a delayed presentation (more than 1 week) were managed conservatively.

Conclusion: As a true urologic emergency, penile fractures should be treated immediately to reduce pain and swelling and ensure better functional and esthetic outcomes. Despite taking more time, a subcoronal circumcising degloving incision is the ideal method because it is exploratory and esthetically pleasing.

Keywords: emergency, penile fracture, tunica albuginea

Introduction

Penile fractures are a rare urological emergency^[1]. The tunica albuginea of either or both corpora cavernosa must rupture in order to be considered a problem. Involvement of the urethra and corpus spongiosum is also possible. Because the tunica albuginea is stiffer and thinner during erection than when it is flaccid, the injury often takes place during erection^[2]. Penile fractures are uncommon, making them an emergency for every patient who sustains one. When the penis is forced into an angle during sexual activity, these patients frequently report hearing a ‘cracking’

HIGHLIGHTS

- Penile fractures are a rare urological emergency. It is defined as ‘rupture of the tunica albuginea of one or both corpora cavernosa.’
- Penile fracture should be treated promptly as a true urologic emergency in order to reduce pain and edema as well as to ensure better functional and esthetic outcomes.
- Subcoronal circumcising degloving incision is the ideal method because it is exploratory and esthetic.

^aDepartment of Surgery, College of Medicine and Health Sciences and ^bUniversity of Gondar, Gondar, Ethiopia

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*Corresponding author. Address: College of Medicine and Health Sciences, University of Gondar, Gondar, P.O.BOX: 196, Ethiopia. Tel.: +968 363 058. E-mail: yderbew73@gmail.com (Y.D. Molla).

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sound. Other contributing factors include turning over in bed onto the erect penis, forcing bending to achieve detumescence, and blunt external trauma such as kicking^[1]. Many occurrences that have been observed in some Middle Eastern nations are the result of patients ‘kneading and snapping’ the erect penis to achieve quick detumescence in inappropriate circumstances. In one Iranian study, 269 of 352 patients (76%) who underwent this procedure, also known as ‘Taqandan,’ experienced penile fracture^[3]. Following a penile fracture, detumescence, discomfort, and subcutaneous hemorrhage usually appear immediately. Twenty percent of the cases may have urethral damage, which typically manifests as blood at the urethral meatus^[4].

The usual patient reports hearing a popping sound during sexual activity as the tunica ruptures, followed rapidly by discomfort, detumescence, and significant subcutaneous bleeding,

resulting in an ‘eggplant deformity.’^[5] It is routine practice to diagnose penile fractures based on their stereotypical clinical appearance. At the time of damage, patients frequently describe hearing a ‘pop’ or crackling sound coming from the erect penis. Some patients have compared the sound to the snapping of a glass rod or corn stalk^[6,7]. Penile fractures can be managed either surgically or without surgery. Ice packs, the insertion of a Foley catheter, and anti-inflammatory medications are all nonoperative treatments for penile fractures^[8]. Rapid functional recovery, a short hospital stay, low morbidity, and no significant long-term effects are the benefits of immediate surgical surgery^[9]. Nonabsorbable sutures should be avoided since they are more likely to cause scarring^[10]. Here, we present our experience with penile fractures at our tertiary hospital.

‘This case series has been reported in line with the PROCESS Guideline’^[11].

Method

This case series was performed at the Department of General Surgery at a tertiary hospital. All patients with penile fractures who presented between January 2018 and January 2023 were included in the study. In order to determine the diagnosis, the time since the injury, the location of the fracture, the amount of the penile hematoma, the presence of blood at the external meatus, and any evidence of urinary retention, all patients were reviewed by careful history-taking and a comprehensive clinical examination upon admission to the hospital. Before the procedure, all patients were resuscitated, and a 16-Fr Foley catheter was placed. Surgery was done under spinal anesthesia in 14 (77.7%) patients. The penile skin and the dartos were both degloved circumferentially. All patients were operated on by urologists and general surgery residents. Four patients with a delayed presentation (more than 1 week) were managed conservatively. The procedure included removing the hematoma, locating the defect(s), closing the defect(s) with a continuous 4/0 Vicryl/3/0 Vicryl absorbable suture while controlling bleeding, closing Buck’s fascia in a longitudinal direction with interrupted 4/0 chromic sutures, skin closure interrupted with 4/0 chromic sutures, wound dressing, and penile bandage application. All of our patients (Figs 1, 2) had a single defect; none of them also had urethral injuries.

Result

A total of 18 patients were included in the study. The patients’ ages ranged from 24 to 70 (with a mean of 37). The duration of the presentation ranges from 7 h to 1 month (median, 22 h). Table 1 shows that sexual activity was the cause in 12 (66%) instances, rolling in bed in three (16%), and physical trauma in three (16%) cases (kicking and edge of bed). Clinically, pain and swelling were present in all of the patients. Fifteen individuals (83%) had a penile deviation. Thirteen (72%) patients reported experiencing rapid detumescence, discomfort, and penile swelling after hearing a cracking (popping) sound. None of these individuals experienced urine retention or urethral hemorrhage, and all were emptied on their own after the episode (Table 2).

A physical examination showed penile ecchymosis, swelling, and substantial discomfort when the penile shaft was touched. All but three patients had evident penile deformities (Figs 3, 4) as well. In 10 cases, the location of the rupture was determined using

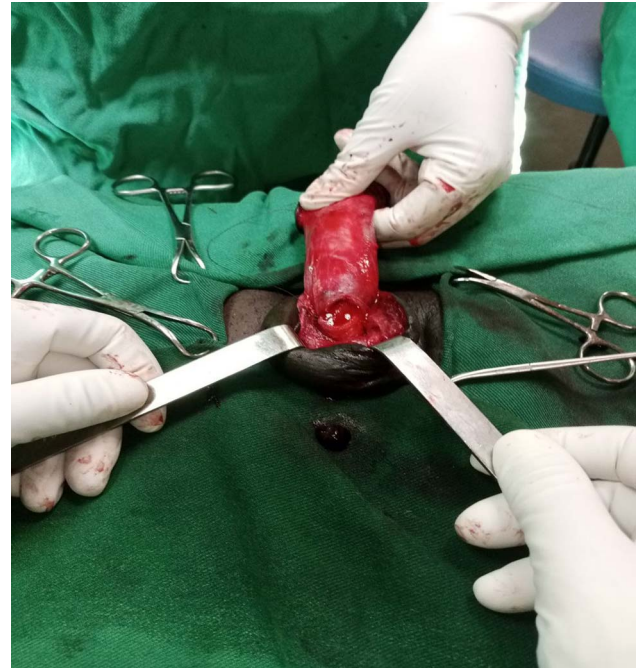


Figure 1. Intraoperative picture showing a 2 cm defect on the tunica albuginea in a patient with penile fracture.

the distinctive rolling indication. In five individuals, blood extravasated along the facial planes into the scrotum and pubic region as a result of the rupture of Buck’s fascia, and in these cases, the rolling sign was less obvious. In our review, there was one patient with a dorsal vein rupture mimicking a penile fracture at presentation.

Urine analysis revealed the absence of microscopic hematuria in all the patients. Caverosography, urethrography, or MRI were not performed in any cases. However, ultrasound (US) was performed in seven patients: in the first patient, there was a 1 cm tunica albuginea defect of the right proximal penis with a 3 × 2.4 cm hematoma collection extending into the subcutaneous tissue; in the second patient, there was a 2.2 cm right posterolateral tunica albuginea defect about 3 cm away from the root with an adjacent communicating collection; and in the third patient, only soft tissue swelling with a loculated hematoma was observed, although the patient had a defect intraoperatively. In



Figure 2. Intraoperative picture showing a defect in another patient.

Table 1**Causes of penile fracture mentioned by the patients**

Etiology	Number of patients (n = 18)
Sexual intercourse related	12 (66%)
Rolling over in the bed	3 (16%)
Blunt trauma	3 (16%)

four patients with delayed presentation (more than 1 week), the US showed only hematoma collection with no discontinuity on the tunica (among them, one patient had dorsal vein rupture).

Fourteen (77%) patients were operated on, and all of them had a single defect with no urethral injury. After the anesthetic wore off on the first postoperative day, the urethral catheter was removed. The average length of stay in the hospital was 4 days (4 + 2). Patients were instructed to take their antibiotics as prescribed for another week, abstain from sexual activity for 6 weeks, and return in 3 months to assess their erection status, the presence of a penile nodule, and the curvature of their erections. If any signs of infection were present, an earlier appointment was advised. At the 3-month follow-up at the surgical referral clinic, none of the patients had any discernible deformity. Neither impotence nor painful erections were mentioned by any of the patients.

Discussion

Penile fractures were first described by Malis in 1925^[12]. With a prevalence of 1 in 175 000 in urology clinics, penile fracture is a rare presenting complaint. It is known as ‘traumatic rupture of the tunica albuginea of the corpora cavernosum.’ It is usually associated with sexual activity and was also observed in the majority of our patients. Other contributing factors include masturbation, turning over in bed onto the erect penis, forcing bending in order to achieve detumescence, and external blunt trauma^[1-13]. The strain of buckling in an engorged corpora can ‘generate pressures in excess of 1500 mmHg, thus exceeding the limit of the thinned tunica.’ The tunica is very thin in the erect penis (as little as 0.25 mm), making it more susceptible^[14]. According to some authors, cavernosal injuries to the unerect penis should not be called ‘fractures’ because the flaccid penis does not have a fulcrum for snapping and possesses a relatively thick tunica albuginea that serves as a protective mechanism^[15]. The majority of our patients also experienced this rapid bending of the erect penis during sexual activity. Other often reported methods of fracture include kneading or violently bending the penis to produce detumescence^[2]. Overall, impacting the female pelvis during sexual activity was the most frequently reported

Table 2**Clinical presentation of patients with penile fracture**

Clinical presentation	Number of patients (n = 18)
Pain and swelling	18 (100%)
Penile deviation	15 (83%)
Rapid detumescence	13 (72%)
Rolling sign	10 (55%)
Blood extravasated along the facial planes	5 (28%)
Urethral bleeding/retention	0

**Figure 3.** Gross appearance of the penis in a patient with penile fracture.

cause of penile fractures, accounting for nearly 80% of cases^[9] and, in our case, 66%. About 50% of penile fractures in some series are caused by the taghaandan maneuver, which involves forcefully bending the shaft of an erect penis to cause rapid detumescence^[16]. However, this maneuver is not practiced in our country, which may partially explain the rarity of this condition. Although there are alternate reasons, such as rough masturbation or rolling over in bed onto the elevated penis, these etiologies are unusual in Western countries^[9]. The term ‘eggplant deformity,’ which describes the combination of localized penile swelling, discoloration, and deviation toward the opposite side of the fracture, is frequently used to describe the overall appearance of a fractured penis (Figs 3, 4)^[6,7]. Corporal tear is frequently found by palpating the surrounding hematoma during a manual examination of the penis. A hard, immovable hematoma that is felt when the penile skin is rubbed over it is referred to as a ‘rolling sign’^[17]. Less frequently, scrotum, suprapubic, and perineal edema brought on by hematoma extravasation outside Buck’s fascia can accompany penile fracture, which was seen in five of our patients^[8]. Voiding symptoms, such as dysuria, urine retention, and gross hematuria, albeit unusual, should be investigated since they could be signs of urethral damage. Urine analysis should be done to check for microscopic hematuria, which may indicate a nonobvious urethral injury^[8-17]. None of our patients had bleeding per meatus, difficulty in urination, or microscopic hematuria.

The ability of US to diagnose penile fractures is quite limited. The rarity of these lesions frequently makes precise diagnosis



Figure 4. Gross appearance of the penis in a patient with penile fracture (AKA eggplant appearance).

impossible because it is a sonographer-dependent procedure whose interpretation depends on the sonographer's experience. Small disturbances in the albuginea in the presence of hematoma at the location of the fracture may be difficult to notice^[18,19]. Due to the rarity of this lesion, only a small percentage of radiologists are skilled in accurately diagnosing penile fractures. Blood clots and edema at the fracture site prevent a thorough inspection, making it easy for an untrained radiologist to miss minor albuginea lesions^[19,20]. In our study, seven patients underwent US scans, and the defect was missed in one patient. Corpus cavernosum lesions can be seen on MRI. Its great accuracy can distinguish between the intensity of the tunica albuginea (low intensity) and the corpora cavernosa vascular sinusoids (high intensity), enabling a correct diagnosis. However, it is an expensive exam, and it may not be available in some hospitals^[21,22]. About 20% of penile fracture cases involve urethral damage, which typically manifests as blood at the urethral meatus, although none of our patients had a urethral injury. A retrograde urethrogram should be carried out when urethral damage is suspected. Any partial or whole urethral disruption

needs to be fixed right away^[4]. It has been suggested that cavernosography can help in the diagnosis of cavernosal rupture. It is a straightforward technique that can be carried out without complicated equipment on the operating table. Some writers highly advise preoperative cavernosography to identify the injury location and aid in the development of therapy recommendations^[23]. Although physical intrusion is diagnostic, there is a chance it could be erroneous. Negative results are always observed because a clot quickly seals the corporeal defect^[24,25]. Although rare, dorsal vein and/or artery rupture is one of the differential diagnoses that should be considered in patients with penile fracture as it has implications in the management^[26].

Two techniques are used to manage penile fractures: First, conservative management, which includes ice packs, Foley catheterization, and anti-inflammatory medications, was initially thought to be the mainstay of management for patients with penile fractures^[27], and the condition was linked to a comparatively high morbidity rate. Antibiotics, fibrinolytic drugs, penis splints, compression bandages, and erection-inhibiting estrogens have all been utilized to lessen the long-term effects of penile fractures, but the long-term complication rates have remained at around 30%^[28]. Even though immediate treatment is still advised in cases of delayed presentation (48 h after the injury), there is still a higher risk of long-term consequences^[8-29].

Rapid functional recovery, minimal hospital stay, low morbidity, and no significant long-term effects are the benefits of immediate surgical surgery. Avoid using nonabsorbable sutures since they are more likely to cause scarring^[30]. There is still disagreement on the kind of incision that should be utilized to treat penile fractures. It was suggested to make longitudinal incisions across the suspected fracture site, parapenile incisions exposing the shaft, or even inguinoscrotal incisions^[31]. Every incision has advantages, although we typically recommend a degloving circumcising incision. As a result, it is possible to assess all three corporal bodies, treat damage anywhere along the shaft's length, and, if necessary, separate or restore the neurovascular bundle^[32]. Since there is a chance of phimosis following the operation due to the extreme penile swelling, we also advise circumcision at the end of the treatment if the patient is not already circumcised. It is advised to make a midline penoscrotal incision to drain the hemorrhage and repair the corpora if tissue edema and a hematoma prevent the use of a degloving incision^[33]. A penoscrotal incision may be advised if the predominant hemorrhage is in the penoscrotal region and the presumed site of injury is deeper^[34]. All of our patients that were operated on were operated via circumcising degloving incision, and all of our patients were previously circumcised. Therefore, we recommend surgical intervention in patients with suspected penile fractures, especially those presented within 48 h of the injury. For those patients with a delayed presentation or those who are not fit for surgery, conservative management is a reasonable option. Finally, all of our patients claimed that they were satisfied with the care they were provided.

Limitation of the study

The number of patients included in the study was relatively small as some of the operated patients were lost to follow-up after the surgery. The duration of the follow-up was also short.

Strength of the study

It was the first study on the topic, and it will serve as a reference for future studies.

Conclusion

A penile fracture should be treated promptly as a true urologic emergency in order to reduce pain and edema as well as to ensure better functional and esthetic outcomes. Despite taking more time, subcoronal circumcising degloving incision is the ideal method because it is exploratory and esthetic. A subdartos flap should be made and put between the repairs of the corpus spongiosum and corpora cavernosa if a concurrent urethral injury has been treated in order to prevent the development of future fistulas.

Ethical approval

An ethical clearance was obtained from the Ethics Review Committee of the School of Medicine, College of Medicine and Health Science, University of Gondar Research, with reference number SBMLS/679/2023.

Consent

Written informed consent was obtained from the patients for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request. Written informed consent was obtained from the patient's parents/legal guardians for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

Y.D.M.: conceptualization, proposal writing, and result writing; H.T.A.: data collection and entry; S.A.K.: data collection and clearing; B.A.E.: revised the case series; D.C.M.: data analysis and revision.

Conflicts of interest disclosure

There were no declared conflicts of interest that would have affected this article.

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