Original Research Article

New Indian Journal of Surgery
Volume 10 Number 5 / September - October 2019
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.10519.1

Penile Fracture: Our Experience in a Tertiary Care Hospital

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How to cite this article:

Suresh Kagalkar, Nirmala Devi. Penile Fracture: Our Experience in a Tertiary Care Hospital. New Indian J Surg. 2019;10(5): 463-468.

Abstract

Introduction: Penile fracture is rare, but it is a urological emergency that always requires immediate attention. Moreover, penile fracture has been reported more frequently in recent years. It may have devastating physical, functional, and psychological consequences if not properly managed in time.

Materials and Methods: The objective of this study was to highlight the causes, clinical presentations, and outcomes of cases of penile fracture. This was a Case Series extending from November 2011 to November 2015. Every patient underwent a thorough clinical evaluation and received proper treatment.

Results: In this study, 40 patients of penile fracture included, ages were 19 to 56 years. Vaginal intercourse was the most common mechanism of injury. Most of the patients (95%) were diagnosed clinically with a proper history and clinical examination. Thirty Six patients were treated surgically. The patients underwent six months of follow-up, and were evaluated with local examinations, questionnaires, and colour Doppler ultrasonography as necessary.

Conclusions: Although penile fracture is an under-reported urological emergency, its incidence is increasing. It is diagnosed based on a clinical examination, but ultrasonography can be very helpful in diagnosis. Especially in cases where treatment is delayed, surgery is preferable to conservative management, because it is associated with better outcomes and fewer long-term complications.

Keywords: Penile fracture; Penis injuries; Urological emergency; Doppler ultrasonography.

Introduction

Injuries to the genitalia are uncommon, in part because of mobility of penis and scrotum. Blunt phallic traumatic injuries is usually of concern only with an erect penis, when fracture of tunica albuginea may result. In general, prompt surgical reconstruction of most penile injuries usually leads to adequate and acceptable cosmetic and functional results.

Penile fracture is the disruption of the tunica albuginea with rupture of the corpus cavernisum. Fracture typically occurs during vigorous sexual intercourse, when the rigid penis slips out of the vagina and strikes the perineum or pubic bone, producing a buckling injury.[1]

The tunica albugenia is a bilaminar structure (inner circular, outer longitudinal) composed of collagen and elastin. The outer layer determines the strength and thickness of the tunica, which varies in different location along the shaft and is thinnest vetrolatarlly. The tensile strength of the tunica albuginea is remarkable, Strength of the tunica albuginea is remarkable, resisting rupture until cavernous pressure rise to more than 1500 mmHg.

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Received on 11.04.2018, **Accepted on** 16.08.2019

When the erect penis bends abnormally, the abrupt increase on intracavernosal pressure exceeds the tensile strength of the tunica albuginea, and a transverse laceration of the proximal shaft usually results.[2–4]

Whereas the penile fracture has been reported most commonly with sexual intercourse, It has also been described with masturbas cenarios in the Middle East, self–infected fractures predominate, the erect penis is forcibly bent during masturbation or as a means to achieve rapid detumscence, the practice of taghaandan (Zargooshi, 2000).[5]

It isreported that 91% of fractures in philadelphia, Pennsylania, were a result of sexual intercourse[2], Zargooshi (2000) described 69% of fractures in Kermanshah, Iran as being due to self—manipulation. The tunical tear is usually transverse and 1 to 2 cm in length.[5] The injury is usually unilateral, although tears in both corporeal bodies have been reported.[3] Although the site of rupture can occur anywhere along the penile shaft, most fracture are distal to the suspensor ligament. Injures associated with with coitus are usually ventral or lateral (Mydlo, 2001; Lee *et al*., 2007), where the tunica albuginea is the thinnest.[6,7]

The diagnosis of penile fracture is often straightforward and can be made reliably by history and physical examination, patient usually describe a cracking or popping sound as the tunica tears.

Materials and Methods

This was a case series extending for Nov 2011 to Nov 2015 including all patient admitted for fracture to the erect penis.

An effort was made to keep all patient in active follow up in the urology out patient department.

During this period, 40 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. The mode of injury, time of presentation history of erotic distention, Penile swelling, bleeding per urethra etc assessed during examination. USG was performed in 38 cases, and RGU was performed in one case. Both surgical and conservative treatment strategies were employed. Distal degloving was performed in 35 cases, and a direct lateral incision was performed in one cases.

Evacuation of the haematoma and repair of the tunical tear with absorbable sutures was carried out. Limited distal circumcision was performed in 15 cases. Perioperative catheterisation was performed in 16 cases, including the two cases involving urethral injuries. In 18 cases, six months of follow-up were completed., The patients were locally examined for penile deviation, fibrotic scarring, nodules, or other wound-related complication. In the third month after treatment, each patient's erectile function was evaluated. patients with a partner were evaluated with the IIEF-5.[8] The sexual function symptom score global self assessment position while unmarried patients without a partner were evaluated with the GASP. The IIEF-5 instrument classifies the severity of erectile dysfunction (ED) into five categories: severe (5–7), moderate (8–11), mild to moderate (12–16), mild (17–21), and none (22–25). The GSAP contains self-assessment questions about the severity of ED adapted from the Massachusetts Male Aging Study, with patients providing their own global self-rating for ED. ED severity was rated as none, mild, mild to moderate, moderate, or severe, depending on whether the patients were able to attain and maintain an erection adequate for satisfactory sexual intercourse always/almost always, usually, sometimes (approximately half of the time), infrequently (with only a minority of attempts at sexual intercourse being successful), or never, respectively. Color Doppler studies were performed in patients with ED. Serial measurements of peak systolic velocity (PSV), end diastolic velocity (EDV), and resistive index (RI) were performed. Cavernous arterial insufficiency is likely when the PSV is <25 cm/s, as a PSV consistently >35 cm/sec defines normal cavernous arterial inflow. The vascular RI was defined as follows: RI=(PSV−EDV)/PSV. RI values > 0.9 have been associated with normal penile vascular function, while RI values < 0.75 are consistent with veno-occlusive dysfunction.[9]

Results

The patients were between 19 to 56 years old. The time interval from injury to presentation was 6-156 hours (mean, 37.66 hours; median, 28 hours). The most common mechanism of injury was vaginal intercourse (50). Masturbation (25) and rolling over on an erect penis during sleep (25%) accounted for the rest of the cases (Table 1). When the penile fracture occurred, four of the patients were having sexual intercourse with the woman on top, three were watching an erotic film during masturbation, and two had ingested sildenafil tablets as a sexual stimulant. The injury occurred between 12 AM and 7 AM in 11 patients, six of whom were injured in the early morning hours, between 3 AM and 7 AM.

In a majority of the cases, the clinical presentation involved an audible popping sound (85%), followed by pain (50%), rapid detumescence (95%), and the development of swelling and discoloration (90%). Two patients experienced bleeding through the urethra. A typical 'eggplant deformity' was seen in 65% of the cases. A palpable gap in the penile shaft (the 'rolling sign') and a deviation of the penis to the opposite side of the fracture were seen in 55% and 65% of cases, respectively.

Diagnosis was possible on the clinical grounds in 35 cases. One patient had a typical history, but the findings of a physical examination were not conclusive. USG was performed in 38 cases. A tunical tear was observed in 15 cases, and a tear of 2 to 3 mm was sufficient for diagnosis in the case in which a clinical diagnosis was not possible. RGU was performed in one case, in which the patient was suspected to have a urethral injury. The mean duration of transurethral catheterization was 13 days (Range: 10–16 days). The overall results were excellent.

Surgical treatment was provided in 36 cases, while Four case with a small tear was treated conservatively. A right corporal tear was observed in 12 cases and 24 cases had.

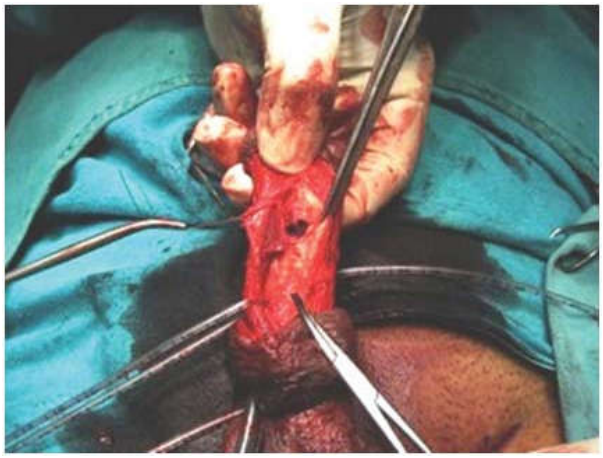
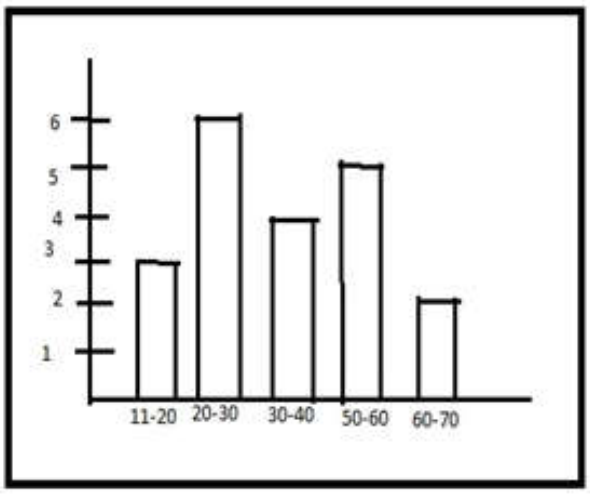


Fig. 1: Penile Fracture and Trauma Treatment

Table 1: Patient characteristics and etiology (n = 20)

General characteristics of patient	Value
Age (yr) 11–20	4 (10%)
21–30	16 (40%)
31–40	5 (12.5%)
41–50	7 (17.5%)
51–60	8 (20%)
Marital status Married	30 (75%)
Unmarried	10 (25%)
Mechanism of injury Vaginal intercourse	10 (25%)
Rolling over on erect penis during sleep	5 (12.5%)
Masturbation	5 (12.5%)



Graph 1: Values are presented as number (%)

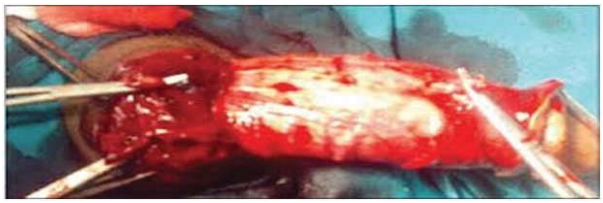


Fig. 2: False Fracture of Penis

Table 2: Surgical technique (n = 19)

Technique	Value
Anesthesia General anesthesia	12 (30%)
Spinal anesthesia	4 (10%)
Local anesthesia	3 (7.5%)
Incision Distal circumcising (degloving) incision	20 (50%)
Direct lateral incision	4 (10%)
Suture material Absorbable	19 (47.5%)
Nonabsorbable 0 Repair Continuous	4 (10%)
Interrupted	15 (37.5%)
Circumcision Done	12 (30%)
Not done	7 (17.5%)
Catheterization Done	16 (40%)
Not done	3 (7.5%)

Values are presented as number (%).

Table 3: Postoperative outcome (n = 19)

Postoperative event	Value
Antibiotics, analgesics and compressive dressing	19 (47.5%)
Erection suppressant Oral estrogen	6 (15%)
Oral diazepam	9 (22.5%)
None	4 (10%)
Complications Mild wound infection	2 (05%)
Distal skin necrosis	2 (05%)
Catheter removal	
(n = 16) After 48 hours	14 (35%)
After 7 days	2 (5%)
Discharge	
At third postoperative day	15 (37.5%)
After third postoperative day	4 (10%)

Values are presented as number (%).

A tear in the proximal third of the penis. Repair was performed using absorbable sutures in all cases (Table 2). Urethral injury was observed in two cases; in one case, the urethral injury was detected preoperatively by RGU, and in the other case it was detected during exploration.

Table 4: Follow-up after penile fracture repair (n = 20)

Follow-up	No. of case
Clinical examination (at third week)	(n = 20)
Small non-tender nodule	20
Visible scar	5
Penile deviation/chordee	0
Evaluation of erectile function (at third month)	(n = 18)
IIEF-5/GSAP No ED	16
ED	2

Two patients showed distal skin necrosis and were managed conservatively. Follow-up was planned, involving a clinical evaluation during the third week and an evaluation of sexual function during the third month. At the first follow-up, all of the patients were evaluated, and two patients found to have a small nodule, which regressed spontaneously. At the second follow-up, 18 patients were evaluated, of whom 16 patients answered the IIEF-5 questionnaire (range of scores, 14–25; mean, 22; median, 22). Two patients complained of ED, with IIEF scores of 14 and 17, respectively. On further evaluation, one of these patients was found to exhibit cavernosal insufficiency (PSV = 25 cm/s).

Discussion

The tunica albuginea, 2 mm thick in the flaccid state, is one of the toughest fasciae in the human body. Its thickness is reduced to 0.25–0.5 mm during erection and becomes vulnerable to traumatic injury.[10–12] Most penile lesions occurs as a result of sexual activity, i.e., 'a false step' during coitus, e.g. during impact of the erect penis against female perineum or the pubic symphysis. The rupture is usually followed by haematoma that can spread to the scrotum, perineum and supra-pubic area when Buck's fascia is disrupted. No concomitant urethral or corpora cavernosa injury was seen in any of our patient.

The typical history and clinical Presentation of fractured penis usually make adjunctive imaging studies unnecessary, Ultrasonography although noninvasive and easy to perform.[10,11] Our literature review found that no data have been published regarding the time of occurrence of penile fractures. Most of the patients in our series were injured in the late night and early morning, which may reflect the circadian rhythm of testosterone secretion. The diagnosis of penile fracture can be reliably made through a proper history and physical examination, as in 95% of our cases. However, numerous recent studies have assessed the diagnostic role of various imaging modalities, such as USG[4,13,14], cavernosography[15,16], RGU[17,18], and magnetic resonance imaging.[6,19] We found USG to be a very helpful tool in the diagnosis of penile fracture. USG was able to show a tunical fracture in 38 out of the 40 cases in which USG was performed and in one case, was able to show a 2–3 mm tear that confirmed the diagnosis despite an inconclusive clinical examination. In an article by Agarwal *et al.*[11], USG was found to be sensitive in only 50% of cases. The results of USG are operator-dependent and USG requires specific expertise, which may explain the relatively poor results of USG in the previous study. RGU is highly sensitive, but is not essential for the diagnosis of urethral injury, since a history suggestive and proper surgical exposure with intraoperative retrograde instillation of methylene blue may be sufficient to diagnose urethral injury.

Immediate surgical reconstruction result in faster recovery, decreased morbidity, lower complication rates, and lower incidence of long-term penile curvature.[20–22]

In our series, surgical exploration was performed in 36 cases[16], while conservative management was employed in four case involving a small fracture with no signs of swelling or deviation. Hinev[21] has recommended conservative management when the cavernosal body is intact. Saita H, *et al.* found that spontaneous healing without complications is probable for tears in the tunica albuginea without extensive haematoma or concomitant urethral injury, which may explain the outcome of our case. Agarwal *et al.*[11] also reported a similar case in their case series. The conservative management of penile fracture has been associated with penile curvature in more than 10% of patients, abscess or debilitating plaques in 25% to 30% of patients, and significantly longer hospitalization times and recovery.[23,24]

In contrast to the above mentioned reports, the conservatively treated patient in our case series had a very good outcome. The proper selection of patients for conservative treatment may have led to the good outcome of conservative treatment in this case.

In out study, distal skin necrosis in two out of three cases seen where a distal degloving incision was made but circumcision was not performed. The differential diagnosis of penile fracture may

include false fracture or rupture of the dorsal vein or the artery of the penis.[25–28] An incidence of 4% to 10% false fractures has been reported[18], but we did not observe any such cases in our series.

Surgery and its timing influences its long-term success. Patients undergoing repair within eight hours of injury have been found to have significantly better long-term results than patients who underwent surgery 39 or more hours after the fracture occurred.[2,18] In our study, the range of the time interval from injury to operation was 10 to 160 hours (mean ± standard deviation, 43.27 ± 38.06 hours; median, 31 hours). One patient underwent surgery 160 hours after trauma, and the only complication was a mild wound infection. The two patients who had ED in the follow-up were operated on 17 and 88 hours after injury. Thus, in our study, delays in surgery did not seem to have a particularly strong effect on the outcome. Moreover, a lack of consensus exists regarding the need for postoperative suppression of penile erection with diazepam or oestrogen; this approach has been routinely used in some studies, but declared to be unnecessary in others.[28] The use of diazepam helps prevent early erections that might have harmful effects, and helps to allay the anxiety that may occur with such trauma. In our series, All the patients were given antibiotics to prevent infection and antierectile medication to reduce the possibility of fracture recurrence. Analgesics were given as and when required.

No definite protocol regarding the use of erectile suppressants was followed, and they were used according to the surgeon's preference. In this regard, no supportive evidence available. However, pain during erection causes detumescence in and of itself, meaning that the use of such drugs is unnecessary. The immediate postoperative outcomes also have varied in different case series. In our series, all patients were discharged on the third postoperative day, with the exception of four patients who developed complications.

Two had mild skin infections and two had distal skin necrosis. All were managed conservatively and discharged between the fifth and tenth postoperative day. Different follow-up protocols and strategies have been reported in different published series. In this study, the first follow-up was in the third week after the operation, and all patients underwent clinical evaluation. Two had a small non-tender nodule over the injury site, and both nodules had resolved spontaneously by the next follow-up. Five patients had visible scars: four had direct lateral incisions and one had skin necrosis in the postoperative period. The next follow-up was at the third month, and only encompassed 18 patients. In this follow-up, postoperative sexual function was evaluated.

Two patients had ED with low IIEF scores. On further evaluation with a Doppler study, one patient was found to have normal vascular flow and the other was found to exhibit cavernosal insufficiency. The most common causes of ED after penile fracture are corporeal veno-occlusive dysfunction, site-specific leaks, and cavernous artery insufficiency.[28] Zargooshi[5], in a personal surgical series incorporating 170 patients, reported that the surgical management of penile fractures resulted in erectile function comparable to that of a control population. A study performed by Nane *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] A case of urethrocutaneous fistula following penile fracture has also been reported.[12] However, our prospective study did not contain any such complications.

Conclusion

Immediate surgical reconstruction results in faster recovery, decreased morbidity, lower complication rates penile fracture is a urological emergency, should be managed promptly. Delay in presentation is mainly due to fear and embarrassment. Mechanism of injury depends on socio cultural characteristic, masturbation habits and indulgence in sexual activities. Diagnosis is usually clinical, but, USG is helpful. Surgery is the treatment of choice. However, conservative treatment may be given in properly selected patients. Early intervention gives better outcome, but, surgery should be offered in delayed presentation also to prevent long term sequelae.

Conflict of Interest: No potential conflict of interest relevant to this article was reported.

References

1. Zargooshi J. Penile fracture in Kermanshah, Iran: report of 172 cases. J Urol. 2000;164:364–6.
2. Morey AF, Dugi DD. Genital and lower urinary tract trauma. In: Wein AJ, Kavoussi LR, Partin

AW, Novick AC. editors. Campbell-Walsh urology. 10th ed. Philadelphia: Elsevier-Saunders, Co.; 2012.pp.2507–2520.

3. Walton JK. Fracture of the penis with laceration of the urethra. Br J Urol. 1979;51:308–9.
4. Eke N. Fracture of the penis. Br J Surg. 2002;89:555–65.
5. Zargooshi J. Penile fracture in Kermanshah, Iran: the longterm results of surgical treatment. BJU Int. 2002;89:890–4.
6. Jack GS, Garraway I, Reznichek R, Rajfer J. Current treatment options for penile fractures. Rev Urol. 2004;6:114–20.
7. Derouiche A, Belhaj K, Hentati H, Hafsia G, Slama MR, Chebil M. Management of penile fractures complicated by urethral rupture. Impot Res. 2008;20:111–4.
8. Rosen RC, Riley A, Wagner G, *et al.* The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. Urology 1997;49:822–30.
9. Feldman HA, Goldstein I, Hatzichristou DG, *et al.* Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. J Urol. 1994;151:54–61.
10. Naroda T, Yamanaka M, Matsushita K, *et al.* Evaluation of resistance index of the cavernous artery with colour Doppler ultrasonography for venogenic impotence. Int J Impot Res. 1994;6:D62.
11. Koga S, Saito Y, Arakaki Y, *et al.* Sonography in fracture of the penis. Br J Urol. 1993;72:228–9.
12. Agarwal MM, Singh SK, Sharma DK, *et al.* Fracture of the penis: a radiological or clinical diagnosis? A case series and literature review. Can J Urol. 2009;16:4568–75.
13. Mahapatra RK, Ray RP, Mishra S, *et al.* Urethrocutaneous fistula following fracture penis. Urol Ann. 2014;6:392–4.
14. Miller S, McAninch JW. Penile fracture and soft tissue injury. In: McAninch JW, editor. Traumatic and reconstructive urology. Philadelphia: W.B. Saunders 1996.pp.693–8.
15. Malis J, Zur K. Der fractura penis. Arch Klin Chir. 1924;129:651.
16. Hoekx L, Wyndaele JJ. Fracture of the penis: role of ultrasonography in localizing the cavernosal tear. ActaUrolBelg. 1998;66:23–5.
17. Karadeniz T, Topsakal M, Ariman A, *et al.* Penile fracture: differential diagnosis, management and outcome. Br J Urol 1996;77:279–81.
18. Abolyosr A, Moneim AE, Abdelatif AM, *et al.* The management of penile fracture based on clinical and magnetic resonance imaging findings. BJU Int. 2005;96:373–7.
19. Fetter TR, Gartmen E. Traumatic rupture of penis. Case report. Am J Surg. 1936;32:371–2.
20. Yapanoglu T, Aksoy Y, Adanur S, *et al.* Seventeen years' experience of penile fracture: conservative vs. surgical treatment. J Sex Med. 2009;6:2058–63.
21. Gamal WM, Osman MM, Hammady A, *et al.* Penile fracture: long-term results of surgical and conservative management. J Trauma. 2011;71:491–3.
22. Hinev AI. Re: penile injury. J Urol 2002;167:1802–3. 24. Orvis BR, McAninch JW. Penile rupture. UrolClin North Am. 1989;16:369–75.
23. Mydlo JH. Surgeon experience with penile fracture. J Urol. 2001;166:526-8; discussion 528–9.
24. Feki W, Derouiche A, Belhaj K, *et al.* False penile fracture: report of 16 cases. Int J Impot Res 2007;19:471–3.
25. Armenakas NA, Hochberg DA, Fracchia JA. Traumatic avulsion of the dorsal penile artery mimicking a penile fracture. J Urol. 2001;166:619.
26. Bar-Yosef Y, Greenstein A, Beri A, *et al.* Dorsal vein injuries observed during penile exploration for suspected penile fracture. J Sex Med. 2007;4:1142–6.
27. El-Sherif AE, Dauleh M, Allowneh N, *et al.* Management of fracture of the penis in Qatar. Br J Urol. 1991;68:622–5.
28. Penson DF, Seftel AD, Krane RJ, *et al.* The hemodynamic pathophysiology of impotence following blunt trauma to the erect penis. J Urol. 1992;148:1171–80.
29. Nane I, Tefekli A, Armagan A, *et al.* Penile vascular abnormalities observed long-term after surgical repair of penile fractures. Int J Urol. 2004;11:316–20.