

Penile fracture - A surgical emergency: clinical presentation and surgical management

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Abstract:

Objectives: To highlight the management of patients with fracture of penis (FP) in terms of aetiology, clinical presentation, diagnosis, treatment and outcome.

Patients and Methods: This prospective observational study conducted at Combined Military Hospital (CMH) Lahore and Peshawar from January 2013 to January 2017, included all patients with fracture of penis. The data was analysed for etiology, mechanism, clinical presentation, treatment and complications.

Results: A total of 36 patients aged 16 to 58 (Mean $28 \pm SD 2.5$) years had fracture of penis. 83.3% patients presented early (within 6 hours of injury). The most common mechanism was aggressive manipulation of erect penis during masturbation (55.5%). Sudden swelling in all patients followed by rapid detumescence (88.8%) and popping sound (88.8%) were most common symptoms. All patients underwent surgical repair. The tear was on right side in 61.1% and on left in 38.9% cases. Mean Hospital stay was $3 \pm SD 1$ days. There was no urethral injury. Palpable nodule was found in 11.1% which resolved spontaneously. There was no residual deformity although 8.3% patients had Erectile Dysfunction (ED) of mild category.

Conclusion: Fracture of penis is a clinical diagnosis but ultrasonography is helpful. Early surgical repair gives good functional results and fewer long term complications.

Keywords: penile fracture, penile injury, masturbation, erectile dysfunction, tunica albuginea, corpora cavernosa

Introduction:

Fracture of penis is an uncommon surgical emergency due to a tear in tunica albuginea covering the corpora cavernosa. First ever case of fracture of penis was reported by Abul Kasem about a 1,000 years ago.¹ Fracture occurs when excessive force is abruptly applied to the long axis of erect penis e.g. during intercourse and vigorous masturbation.² In an erect penis the tunica albuginea becomes very thin (up to 0.25 mm), moreover the strain of sudden undue flexion of underlying engorged corpora can create pressures as high as 1,500 mmHg thus testing the limits of thinned out tunica which can then rupture causing loss of blood in subcutaneous tissue with resultant swelling, pain, hematoma and rapid detumescence.^{3,4} Patients usually present early but few

present late due to sheer embarrassment. The diagnosis is clinically evident but few cases may need to be investigated especially when the history is inconsistent or there is suspicion of urethral injury.⁵ Early evacuation of hematoma and repair of tunica defect give better functional results and reduce the incidence of penile deformity and erectile dysfunction.⁴

We evaluated the management of penile fracture in our setup in terms of mechanism, presentation, treatment and complications.

Material and methods:

All consecutive patients from January 2013 to January 2017 reporting to a consultant surgeon in Combined Military Hospital Lahore and Pe-

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Table 1: Baseline characteristics, etiology and presentation

Total Cases (n)	36
Age (in Years)	Mean 28 ± SD 2.5 (Range 16-58)
Marital status	Married : 88.8% (32) Unmarried : 11.2% (04)
Etiology of fracture:	
Masturbation	55.5% (20)
During Intercourse	16.6% (06)
Roll over on erect penis during sleep	16.6% (06)
Blunt injury to erect penis	11.1% (04)
Time from injury to presentation:	
Within 6 hours	83.3% (30)
6-24 hours	11.2% (04)
>24 hours	5.5% (02)

Table 2: Clinical Symptoms and Signs

Total cases (n)	36
Symptoms:	
Eggplant deformity	100% (36)
Rapid de-tumescence	88.8% (32)
Popping noise	88.8% (32)
Pain	83.3% (30)
Inability to pass urine	5.5% (02)
Signs:	
Hematoma/Bruising	94.4% (34)
Rolling Sign	88.8% (32)
Penile deviation	Left side [61.1% (22)] Right side [38.9% (14)]
Swelling without bruising	5.5% (02)

shavar with a suspected FP were included in this study. The data was collected regarding the age, marital status, mechanism resulting in injury (fracture), time delay between incident and presentation, clinical presentation (e.g. presence of audible popping or cracking sound, pain, rapid detumescence, deviation of penis, skin haematoma and a palpable gap in the shaft), diagnosis (clinical or assisted with a diagnostic tool), treatment (surgery/conservative), peroperative findings (site, size of tear and penile deviation), total hospital stay and post-operative complications (early and delayed).

Diagnosis was made clinically based on history and examination. Penile ultrasound was done by a consultant radiologist in difficult cases where history was atypical. An informed consent was obtained and all patients were explored under general or spinal anaesthesia. A sub-coronal de-

gloving incision was used in all cases. The defect in the tunica albuginea was identified and measured, hematoma drained followed by closure of defect with 3/0 absorbable suture applied in interrupted fashion with knots buried inside. No stitches were applied to the delicate corporal tissue. Appropriate sized Foley's catheter was inserted per-operatively and was continued for urine drainage post operatively for 48 hours. Patients were discharged once they were pain free and able to pass urine without discomfort. All patients were advised to refrain from sexual activity and penile manipulation for 4 weeks. Patients were followed up every 2 weeks for 2 months then monthly for 6 months. Patients were assessed for any long term complication such as penile deviation, scarring or nodules. Erectile dysfunction (ED) was assessed at 3 months using International Index of Erectile Function Version 5 (IIEF-5) score.

The collected data was analysed using statistical package for Social Sciences (SPSS) version 22. Age was calculated as mean and standard deviation. Categorical data was presented as frequency and percentage.

Results:

During the study period, a total of 42 patients presented with a suspected FP. Three patients had local superficial bruising only and three complained of pain only which got relieved with oral analgesics; these 6 patients underwent ultrasound of penis and no defect in tunica albuginea and/or hematoma was found. After excluding these 6 patients a total of 36 patients with FP were enrolled in the study.

The age at the time of presentation varied from 16 to 58 (Mean 28±SD 2.5) years. In them, 88.8% (32) were married and 11.2% (04) were unmarried. The time interval between the injury and presentation in hospital was within 6 hours in 83.3% (30), 7-24 hours in 11.2% (04) and more than 24 hours in 5.5% (02) cases [Table 1]. The most common mechanism leading to fracture was aggressive manipulation of erect penis during masturbation in 55.5% (20) patients. In them, 16 were married and 4 were

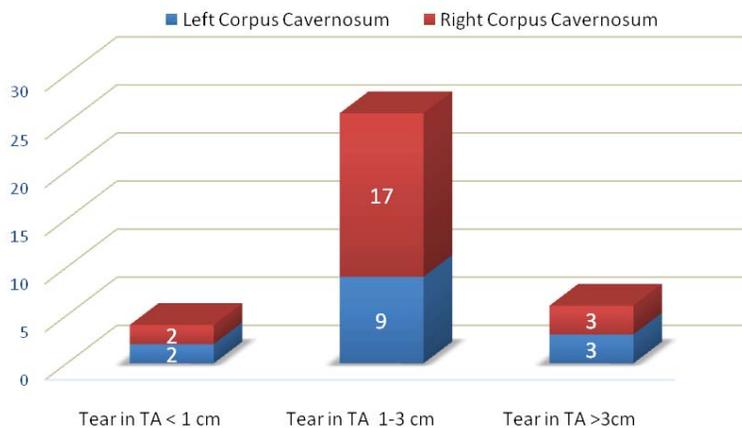


Figure 1: Injury pattern to penile shaft (TA = Tunica albuginea)

unmarried. The other mechanisms included intercourse [16.6% (06)], rolling over in bed on erect penis [16.6% (06)], forceful manual bending [5.5% (02)] and unexplained blunt trauma to erect penis [5.5% (02)]. Three patients (all aged more than 40) had taken oral sildenafil as sexual stimulant. Those who had fracture during intercourse sustained the injury when erect penis slipped out of vagina and hit the pubic bone or perineum while being reinserted.

All patients noted swelling of the penis which was maximum around the coronal part of penile shaft (Eggplant deformity). There was audible popping noise and rapid detumescence in 88.8% (32) patients. Pain was experienced in 83.3% (30) while 5.5% (02) patients were unable to pass urine. No patient complained of bleeding from urethra. On examination, 94.4% (34) had visible bruising and palpable hematoma of penile shaft. Bruising also extended into the anterior half of the scrotum in 3 cases however the testes were normal. Due to swelling and hematoma, there was visible deviation of the penis to left in 61.1% (22) and right in 38.9% (14) cases. A palpable defect/gap was felt in the penile shaft at the site of tear (Rolling sign) in 16.6% (06) cases [Table 2]. Diagnosis was made on clinical grounds with typical history and classical signs on examination. Two patients with inconsistent history underwent ultrasound and a defect was noted in tunica along with hematoma. Two patients who were unable to pass urine underwent retrograde urethrogram (RU) to assess urethral

injury however none was found.

On surgical exploration by subcoronal degloving approach, a tear was found in the tunica albuginea with a hematoma in the underlying corpus cavernosum. The tear was on right side in 61.1% (22) and on left in 38.9% (14) cases [Figure 1]. No bilateral tear was found. There was no injury to corpus spongiosum or urethra.

Mean stay in hospital was 3±SD 1 days. The subcutaneous bruising and swelling settled by 04 weeks. There was no residual deformity. There were 11.1% (04) patients who complained of a palpable nodule at the injury site. It settled in all cases by 12 weeks. ED was assessed at 03 months. The mean IIEF-5 score in 91.6% (33) patients was 23±SD 1 (Normal 22-25). Three patients complaining of ED had a score of 18, 18 and 19 respectively; all three were in Mild ED category (17-21). These 3 patients were referred to urology for further assessment.

Discussion:

Penile fracture “faux pas” is a condition in which one or both of the tunica albuginea (a thick fibrous sheath enveloping corpus cavernosa) rupture due to rapid excessive blunt force exerted to the long axis of an erected penis. The tunica albuginea measures 2 mm in a flaccid penis but gets thinned out to 0.25 mm during erection. Erection converts the safe flaccid penis into a vulnerable stiff organ where pressures in corpora cavernosa rises in excess of 1500 mmHg.^{1,4} De Rose et al suggested structural anomalies of the tunica albuginea as a predisposing factor in fracture of penis.⁶

The Etiology of FP is variable related to geographical areas. A meta-analysis revealed vigorous sexual intercourse (46%) as main cause in Western countries while forced flexion (21%) and masturbation (18%) were more common causes in Eastern countries⁴. Boujnah et al found masturbation as a primary cause in 91% of his patients.⁷ The reason for difference of cause in West and Muslim countries could be due to strict prohibition of extramarital sex. The longer time it takes to reach orgasm by manipulation

than by coitus makes the penis more prone to injury. Forceful bending by self to achieve rapid detumescence of penis – a practice called “taq-naadan” was found to be a major cause (76%) in certain Muslim countries like Iran.⁸ In our study we found only 16.6% cases of FP related to sexual intercourse and 55.5% to masturbation. There was no case of forced self-bending in our series. The view whether any particular sexual position during intercourse is responsible for increase chances of FP is controversial. Tijani et al in his study postulated that “woman on top” position resulted in more FP than any other position, probably due to sudden buckling of erect penis against the weight of the female partner.⁹ However the meta-analysis by Amer et al failed to relate FP during sexual intercourse to a particular position.⁴ In our study, 66.6% patients who had FP during sexual intercourse had man on top “missionary” position. In such position fracture probably resulted when the erect penis hit the pubis or perineum while being re-inserted during sexual intercourse.

The distinctive clinical features include a click/pop, pain, deformity, bruise, hematoma, deviation and a palpable gap in the penile shaft. The physical appearance of the fractured swollen penis has been described as an “eggplant deformity” or “aubergine sign” is the name by which injured swollen penis has been described.^{8,10} The ecchymosis may spread to the scrotum, perineum, and suprapubic area if Buck’s fascia integrity is broken. History of sudden click, pain, ecchymosis, hematoma and deviation to the opposite side of injury, were the most common features in our study.

Urethral bleeding and a difficulty to pass urine indicate urethral involvement.⁵ We had 5.5% cases unable to pass urine however none had urethral bleed and no urethral injury was found in any such case. El-Sherif et al reported low incidence of urethral injuries in non coital FP.¹¹ Since our study also had lower number of FP attributed to coitus, we assume that could be reason for having no urethral injury in our series.

Amer et al. in a meta-analysis study mentioned

that thirty one authors used no imaging to diagnose fracture penis, emphasizing that an accurate diagnosis is possible based on clinical assessment alone.⁴ Meanwhile 22 authors used various imaging modalities to confirm the diagnosis including ultrasonography (US), cavernosography, retrograde urethrography and Magnetic Resonance Imaging (MRI).¹² European Association of Urology guidelines suggest that imaging (US or MRI) may be useful in diagnosing fracture penis.¹³ Moreno et al. emphasized that complementary tests were helpful but they were not definitive.¹⁴ In our study, 94.5% of the cases were diagnosed clinically. Retrograde urethrography to assess urethral damage was done in 5.5% patients only who were unable to pass urine. Hence we do not recommend it routinely, as it is an invasive procedure and complications like priapism have been reported.¹⁵

The mid shaft fractures were common in our study as compared to the other studies where proximal shaft fractures has been found and explained by proximal location of the fulcrum of the erect penis.^{1,8} We can explain it by considering masturbation as the main precipitating cause in our study rather than coitus as in other studies.

Conservative management of fracture penis is not recommended.¹⁶ A pooled analysis was done by Amer et al. to compare early surgical intervention with conservative management.⁴ It showed that early surgical intervention is better in reducing the morbidity and long terms complications such as ED (P value < 0.00001), painful plaques and nodules (P value < 0.05), penile curvature (P value < 0.0001) and painful erection (P value < 0.0001). Similarly, Mazaris et al also recommended early surgical intervention in all cases of fracture penis (FP).¹⁷ The World Health Organization also recommends that all acute injuries to the tunica albuginea be repaired immediately by surgical intervention with synthetic, absorbable, inverted knot sutures as non-absorbable sutures may cause painful, palpable suture knots.¹⁸ Most of the studies recommended the use of absorbable sutures but studies exist in literature where the authors

have used non-absorbable nylon sutures with no long term complications.⁵ A study by El-Assmy et al compared absorbable and non-absorbable sutures and concluded that non-absorbable sutures has higher tendency of painful nodules/scar formation (P value 0.001).¹⁹ We urgently explored all the cases, drained haematoma, secured haemostasis, and repaired the tear using absorbable synthetic suture with inverted knots.

There is variable data comparing immediate versus delayed surgical intervention. A meta-analysis performed by Wong et al showed no difference in terms of long term complications between immediate and delayed surgical intervention.²⁰ Kozacioglu et al with a mean surgical delay of 11.3 ± 8.5 hours from presentation to operation also concluded that no difference was found in terms of erectile dysfunction, curvature or nodule formation between early and delayed surgical intervention group.²¹ Similarly El-Assmy et al found no long term complications even with a surgical delay up to 7 days.²² We however opted for early surgical intervention and mean delayed in our series from presentation to operation was 3.5 ± 1.5 hours.

A lack of multi-centre prospective comparative studies will always be a limitation to discuss rare conditions such as this. The reality is that such studies would take an extremely long time even in a multi-institution setting. Nevertheless, this study has emphasised the compelling need for penile fractures to be treated surgically in a timely manner so as to minimise physical and psychological morbidity as well as reduce the chances of long term complications.

Conclusion:

Fracture penis is a rare urological emergency which can be easily diagnosed clinically without diagnostic aid. Early surgical intervention has good functional results and lower long term complications.

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Role and contribution of authors:

Dr Muhammad Jamil, MBBS; FCPS (Pak); MRCS (Eng); OJT Vascular (UK), Consultant Vascular Surgeon and Associate Professor of Surgery, Writing, Study conception, Data collection, Analysis, Critical review and revision, Final approval of the article, Accountability for all aspects of the work

Dr Muhammad Saeed, MBBS, FCPS, Consultant anaesthetist, collected the data and references and helped in discussion writing

Dr Rashid Usman, MBBS (KEMU); MRCS (UK); FCPS (Pak), Consultant Vascular Surgeon & Assistant Professor of Surgery, Writing, Data collection, Investigation, Critical review and revision, Final approval of the article, Accountability for all aspects of the work

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