



## Functional outcomes following repair of fracture penis

<b>Dr.ChikkaMogaSiddaiahManohar</b>	Assistant Professor, Department of Urology, Institute of Nephrourology, Victoria Hospital Campus, Bangalore 560002, India.
<b>Dr.RamaiahKeshavamurthy</b>	Professor and Head, Department of Urology, Institute of Nephrourology, Victoria Hospital Campus, Bangalore 560002, India.
<b>Dr.VilvapathySenguttuvanKarthikeyan</b>	Senior Resident, Department of Urology, Institute of Nephrourology, Victoria Hospital Campus, Bangalore 560002, India.
<b>Dr.VenkateshShivakumar</b>	Assistant Professor, Department of Urology, Institute of Nephro Urology, Victoria Hospital Campus, Bangalore 560002, India.
<b>Dr.Sadanand Poojary</b>	Senior Resident, Department of Urology, Institute of Nephrourology, Victoria Hospital Campus, Bangalore 560002, India.

## ABSTRACT

**Introduction:** Penile fracture (FP) is characterised by disruption of the tunica albuginea with rupture of the corpus cavernosum caused by trauma to the erect penis. We evaluated the clinical presentation, operative details and erectile function and urinary outcomes after operative treatment of FP. **Methods:** FP (n=23) patients operated from January 2010 to April 2015 at a tertiary care urological centre were evaluated for mode of presentation, mechanism of injury, time to presentation, intraoperative findings and post-operative outcomes. Assessment for penile deformity, erectile function using International Index of Erectile Function-5 (IIEF) score at 3 and 6 months postoperatively and urinary symptoms using International Prostate Symptom Score (IPSS) was performed. **Results:** Mean ( $\pm$  SD) age was  $33.8 \pm 19.2$  years. Etiology of FP included vigorous sexual intercourse in 10 (43.5%), self-inflicted injury on erect penis in 7 (30.4%), accidental trauma to or fall on erect penis in 4 (17.4%) and during rolling over the bed in 2 (8.7%) patients. Median time from injury to presentation was 10 hours. Urethral injury was noted in 4 (17.4%) patients and immediate repair was done. Excluding the patient with delayed repair, the mean total IIEF 5 Score was 12.72 at 3 months and 18.36 at 6 months repair. Only the patient who presented 15 days after FP had ED. Patients with urethral injury had no post-operative urinary symptoms. **Conclusion:** Immediate surgical intervention has low morbidity, short hospital stay, rapid functional recovery, and no serious long-term sequel. Early surgical repair within 48 hours is associated with a good outcome.

## KEYWORDS

## INTRODUCTION

Penile fracture (FP) is an uncommon condition that is defined the disruption of the tunica albuginea with rupture of the corpus cavernosum caused by trauma to the erect penis. True incidence is probably higher than reported as many patients do not seek medical attention due to embarrassment or fear.<sup>1,3</sup> Immediate surgery results in faster recovery, decreased morbidity, lower complication rates, and lower incidence of long-term penile curvature.<sup>4</sup> Timing of surgery may influence long-term success. Early repair <8 hours of injury produces better long-term results and surgery delayed beyond 36 hrs after FP yields poor results.<sup>4</sup> FP with early or delayed presentation up to 7 days should be managed surgically.<sup>5</sup> Risk factors for ED following repair of fracture penis include age >50 years and bilateral corporal involvement.<sup>6</sup> ED of either a psychological or vascular origin can be encountered as a long-term sequel of surgical treatment of FP.<sup>6</sup> We evaluated the clinical presentation, operative details and long-term erectile function and urinary outcomes after operative treatment of FP.

## MATERIALS AND METHODS

This study was performed at a tertiary care urological centre in South India catering to around 40000 urological patients per year. Patients operated for FP from January 2010 to April 2015 were included from institutional database and were followed up for outcomes and complications. The mode of presentation, mechanism of injury, time to presentation and pre-operative penile ultrasound if performed, treatment, intraoperative findings and post-operative complications were recorded. Follow up

assessment included assessment for penile deformity and erectile function using International Index of Erectile Function-5 (IIEF) score at 3 and 6 months postoperatively. Erectile dysfunction (ED) was classified based on IIEF score and urinary symptoms were assessed using International Prostate Symptom Score (IPSS).<sup>7</sup>

## RESULTS

A total of 23 patients with a mean ( $\pm$  SD) age of  $33.8 \pm 19.2$  (range: 19-54) years presented with FP and it included 12 (52.2%) patients from urban and 11 (47.8%) patients from rural area.

## Clinical presentation and time to surgery

Etiology of FP included vigorous sexual intercourse in 10 (43.5%), self-inflicted injury on erect penis in 7 (30.4%), accidental trauma to or fall on erect penis in 4 (17.4%) and during rolling over the bed in 2 (8.7%) patients. The median time from injury to presentation in the hospital was 10 hours (range: 4-360 hours). Patients presented with penile swelling in 16 (69.6%), penile pain and swelling in 12 (52.2%), detumescence in 4 (17.4%) and urethral bleed in 2 (8.7%). All FP were diagnosed based on history and clinical examination (Fig. 1). Tunical tear was identified clinically in all patients. Preoperative ultrasonography was done in 4 (17.4%) patients; all patients had hematoma and tunical tear was identified in 3 (75%) patients. The time period between injury and surgery was <6 hours in 7 (30.4%), 6-12 hours in 5 (21.8%), 12-24 hours in 6 (26.1%), 24-48 hours in 4 (17.4%) and 15 days in 1 (4.3%) patients.

### Operative details and length of hospitalization (LOH)

We used a subcoronaldegloving incision in our patients after spinal or general anesthesia. Right corpus injury was noted in 13 (56.5%) and left corpus injury in 7 (30.4%) patients. Bilateral corporal tears were observed in 3 (13.1%) patients. Urethral injury was noted in 4 (17.4%) patients. Location of urethral injury was distal bulbar urethra in 2 (50%) and mid bulbar urethra in 2 (50%) patients. Two (66.7%) patients with bilateral corporal tears had urethral injury. For FP patients underwent primary repair using 4-0 vicryl interrupted sutures (Fig. 2,3). Patients with urethral injury underwent primary repair of the urethra at same time as repair of the tunica with interrupted 5-0 polydioxanone sutures over a 14 French siliconised latex urethral catheter. The median (IQR) LOH was 3 (4) days after surgery for FP. The patient with delayed presentation (>15 days) had a prolonged LOH of 8 days due to wound infection on third postoperative day.

### Follow-up

Out of 23 patients, 17 (73.9%) patients were available for follow up. The median (IQR) follow-up period was 24 (12) months and 16 (94.1%) patients reported achieving adequate erection for intercourse without ED. None of the patients reported voiding dysfunction or deformity of the penis. Excluding the patient with delayed repair, the mean total IIEF 5 Score was 12.72 at 3 months and 18.36 at 6 months repair. Patients with urethral injury had no post-operative urinary symptoms. Only the patient who presented 15 days after FP had moderate ED. Including this patient, the mean total IIEF 5 score was 13.4 at 3 months and 19.4 at 6 months (Fig. 4). The mean ( $\pm$  SD) IPSS was  $7.2 \pm 4.1$ . The mean maximal flow rate was 25.1 ml/sec (25-32 ml/sec) at 6 months after. Risk factors for ED following repair of FP included age more than 50 years, bilateral corporal involvement and delayed presentation.

### DISCUSSION

The first documented report of FP dates back to more than 1000 years.<sup>3</sup> FP occurs due to buckling injury caused during vigorous sexual intercourse when the rigid penis slips out of the vagina and strikes the perineum or pubis.<sup>8</sup> Diagnosis of FP is based on the typical history of popping followed by rapid detumescence, acute swelling, pain and penile deformity.<sup>3,8</sup> Patients delay coming to the hospital due to fear and embarrassment.<sup>1-3</sup>

### Mechanism of injury

Sexual intercourse (46%) followed by masturbation (18%) and rolling over the bed on an erect penis (8.2%) were the commonest reported causes of FP.<sup>8</sup> In our population, we observed that FP during sexual intercourse (43.5%) was the commonest etiology followed by injury during self-manipulation (30.4%). Agarwal et al reported that 88% developed FP during sexual intercourse while Nawaz et al found that 40.8% patients developed FP during self-manipulation and sexual intercourse (28.46%).<sup>9,10</sup> We observed bilateral corporal tears in 13.1% patients while other authors have observed 2.2–8.4% bilateral corporal tears.<sup>11</sup>

### Clinical presentation and diagnosis

An eggplant deformity occurs due to localized penile swelling, discoloration and deviation of penis to the contralateral side of tunical tear.<sup>3,8</sup> If the Buck fascia is intact, the penile hematoma remains contained between the skin and tunica. If Buck fascia is disrupted then the hematoma can extend to the scrotum, perineum, and suprapubic regions.<sup>8</sup> The mean age of our patient population was 33.8 years which was similar to that (31.3 years) reported by Ghilan et al.<sup>12</sup> Other authors have reported mean ages as low as 25 years and as high as 36 years.<sup>9,10</sup> Clinical examination accurately diagnosed FP and predicted cavernosal tear.<sup>3</sup> Ultrasonography did not influence patient management in our patients, as also observed by other investigators.<sup>9-14</sup> Magnetic resonance imaging is highly accurate in defining tunical tears but unnecessarily delays definitive treatment. It is also expensive and not universally available.<sup>15</sup>

### Urethral injury

We observed urethral injury in 4 (17.4%) patients and it was similar to that reported by Agarwal et al.<sup>9</sup> Only 1 patient (9.1%) had urethral injury in a series of 11 patients reported by Ibrahim et

al.<sup>11</sup> Based on a meta-analysis, 5.6% patients presented with urethral bleed but 6.1% had urethral injury and hence absence of urethral bleed does not exclude urethral injury.<sup>8</sup> A higher incidence of urethral injury has been reported from the USA and Europe (20%).<sup>3</sup> In our series, only 2 out of 4 (50%) patients had urethral bleed. We did not perform routine preoperative urethrography or urinalysis in our patients. Microscopic hematuria has been shown to be indicative of urethral injury in some studies, however the yield is less and it is time consuming.<sup>15</sup> There is no consensus on performing preoperative urethrography in patients with suspected urethral injury.<sup>8</sup> It has been reported that urethrography is not mandatory in these patients as the location of urethral injury is almost always close to the site of corporal tear.<sup>16</sup> Derouiche et al have reported that they perform suprapubic cystostomy in patients with suspected urethral injury.<sup>15</sup> We did not perform suprapubic cystostomy in our patients and none of them had postoperative complications. Kamadar et al have reported the use of intraoperative flexible cystoscopy to rule out urethral injury.<sup>17</sup> Our patients with urethral injury underwent primary repair of the urethra at same time as repair of the tunica with good postoperative outcome. We observed that 2 out of 3 patients (66.7%) with bilateral corporal tears had urethral injury. Phillips et al had reported 100% association of bilateral corporal tears with urethral injury as also observed by Pavan et al.<sup>18,19</sup>

### Operative details and LOH

Aman et al recommended early emergency surgery for easy tissue handling and to minimize complications.<sup>20</sup> Even in patients with FP presenting as late as 1 week, repair of the defect is recommended.<sup>21</sup> We also observed that early repair was successful and even in the patient who presented late (15 days). The median hospital stay in our study was 3 days and compared favorably with Agarwal et al at 2 days.<sup>9</sup> According to the meta-analysis LOH ranged from 1–21 days and the mean LOH was 3.5 days for FP repair versus 5.2 days for conservative management of FP.<sup>8</sup> We performed immediate repair for all patients presenting to our institute. The protocol for managing FP has evolved from a conservative approach in initial days to immediate surgical exploration in the modern day even in patients with delayed presentation.<sup>3,8</sup> The most commonly used technique is a subcoronaldegloving incision followed by evacuation of hematoma and repair of the tunical tear with absorbable or non-absorbable sutures.<sup>3,8,15</sup>

### Erection adequate for sexual intercourse

We observed that 93.5% had adequate erection for sexual intercourse which was almost similar to 92.2% reported by Ibrahim et al.<sup>11</sup> While Nawaz et al observed that only 64.96% patients had adequate erection for sexual intercourse, Agarwal et al and Ghilan et al observed that erectile function returned in all patients (100%) adequate for penetration.<sup>9,10,12</sup>

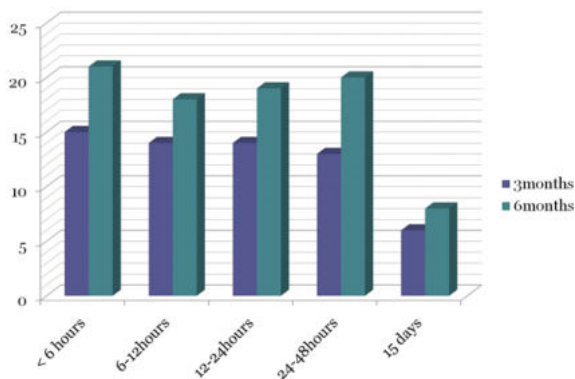
### CONCLUSION

Immediate surgical intervention has low morbidity, short hospital stay, rapid functional recovery, and no serious long-term sequel. Early surgical repair within 48 hrs is associated with a good outcome.

Legends to figures

**Fig 1:** Egg-plant deformity of fracture penis



**Fig. 2:** Intraoperative repair of the rent in the tunica**Fig. 3:** Repaired rent in the tunica**Fig. 4:** IIEF score at 3 and 6 months after penile fracture repair based on time to presentation

## REFERENCES

- Orvis BR, McAninch JW. Penile rupture. *Urol Clin North Am* 1989;16(2):369-75.
- Eke N. Fracture of the penis. *Br J Surg* 2002;89(5):555-65.
- Mahapatra RS, Kundu AK, Pal DK. Penile Fracture: Our Experience in a Tertiary Care Hospital. *World J Mens Health* 2015;33(2):95-102.
- Asgari MA, Hosseini SY, Safarinejad MR, Samadzadeh B, Bardideh AR. Penile fractures: evaluation, therapeutic approaches and long-term results. *J Urol* 1996;155(1):148-9.
- el-Assmy A, el-Tholoth HS, Mohsen T, Ibrahim el-HI. Does timing of presentation of penile fracture affect outcome of surgical intervention? *Urology* 2011;77(6):1388-91.
- El-Assmy A, El-Tholoth HS, Abou-El-Ghar ME, Mohsen T, Ibrahim EH. Risk factors of erectile dysfunction and penile vascular changes after surgical repair of penile fracture. *Int J Impot Res* 2012;24(1):20-5.7. International Prostate Symptom Score. Available from: <http://www.urospec.com/uro/Forms/ips.pdf>. Last accessed: 22/01/2017.
- Amer T, Wilson R, Chlosta P, AlBuheissi S, Qazi H, Fraser M, et al. Penile Fracture: A Meta-Analysis. *Urol Int* 2016;96(3):315-29.
- Agarwal MM, Singh SK, Sharma DK, Ranjan P, Kumar S, Chandramohan V, et al. Fracture of the penis: a radiological or clinical diagnosis? A case series and literature review. *Can J Urol* 2009;16(2):4568-75.
- Nawaz H, Khan M, Tareen FM, Khan S. Penile fracture: presentation and management. *J Coll Physicians Surg Pak* 2010;20(5):331-4.
- Ibrahim el-HI, el-Tholoth HS, Mohsen T, Hekal IA, el-Assmy A. Penile fracture: long-term outcome of immediate surgical intervention. *Urology* 2010;75(1):108-11.
- Ghilan AM, Al-Asbahi WA, Ghafour MA, Alwan MA, Al-Khanbashi OM. Management of penile fractures. *Saudi Med J* 2008;29(10):1443-7.

- Zargooshi J. Penile fracture in Kermanshah, Iran: the long-term results of surgical treatment. *BJU Int* 2002;89(9):890-4.
- Kalash SS, Young JD Jr. Fracture of penis: controversy of surgical versus conservative treatment. *Urology* 1984;24(1):21-4.
- Kumar BN, Akulwar AV. Fracture penis - Is it really an uncommon entity? *Med J Armed Forces India* 2015;71(Suppl 1):S211-3.
- Derouiche A, Belhaj K, Hentati H, Hafsia G, Slama MR, Chebil M. Management of penile fractures complicated by urethral rupture. *Int J Impot Res* 2008;20(1):111-4.
- Kamdar C, Mooppan UM, Kim H, Gulmi FA. Penile fracture: preoperative evaluation and surgical technique for optimal patient outcome. *BJU Int* 2008;102(11):1640-4; discussion 1644.
- Phillips EA, Esposito AJ, Munarriz R. Acute penile trauma and associated morbidity: 9-year experience at a tertiary care center. *Andrology* 2015;3(3):632-6.
- Pavan N, Tezzot G, Liguori G, Napoli R, Umari P, Rizzo M, et al. Penile fracture: retrospective analysis of our case history with long-term assessment of the erectile and sexological outcome. *Arch Ital Urol Androl.* 2014 Dec 30;86(4):359-70.
- Aman Z, Qayyum A, Khan M, Afridi V. Early surgical intervention in penile fracture. *Journal of Postgraduate Medical Institute (Peshawar-Pakistan)* 2011;18(3):432-8. Available from: <http://jpmi.org.pk/index.php/jpmi/article/viewFile/911/820>. Last accessed: 22/01/2017.
- Naraynsingh V, Hariharan S, Goetz L, Dan D. Late delayed repair of fractured penis. *J Androl* 2010;31(2):231-3.