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Diagnosis and modalities of treatment of Fracture penis in a single center: An observational study

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ABSTRACT

Introduction: Penile fracture has very low incidence. Sexual intercourse, masturbation, or forceful penile manipulation are the common causes of penile fracture. Surgery is the primary treatment but in certain cases conservative treatment is also beneficial but usually has poor outcome. The aim of this study was to review the pattern of penile fracture occurrence, its clinical presentation, diagnosis, management, and outcome at our center.

Materials and Methods: Between 2012 to 2018 and, 30 patients with penile blunt trauma on an erect penis were admitted to our center. We analyzed the following variables: age, etiology, symptoms and signs, diagnosis, treatment, complications and erectile dysfunction during the follow-up. 29 patients underwent surgical repair and 1 patients were submitted to conservative management.

Results: Follow-up was in every three months for one year. Trauma during sexual relationship was the main cause of penile fracture. The most common site of tear was the proximal shaft of penis. Urethral injury was not present in any patient. During follow-up, 27 cases (93.10%) of the surgical group and one of the conservative group reported sufficient erections for intercourse, with no voiding dysfunction. However, the remaining 2 patients (6.89%) from the surgical group developed erectile dysfunction and penile deviation.one patient managed conservatively developed chordee.

Conclusion: Early surgical intervention is the primary modality of treatment for fracture penis and give better outcome with less complications.

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1. Introduction

Penile fracture is one of the uncommon urological emergencies. The first documented report of this fracture is credited to an Arab physician, Abul Kasem, in Cordoba over 1000 years ago.[1] Penile fracture is defined as a rupture of the tunica albuginea of the corpus. The urethra and corpus spongiosum may also be affected. In an erect penis, this fascia is much stretched and taut, thus prone for fracture if subjected to undue sudden flexion forces. Common causes include coitus, sudden forced flexion in the erection state, rolling over in bed, and masturbation. Penile fracture has a typical clinical presentation that includes the report of a cracking sound, followed by penile detumescence and pain.

Physical examination usually includes oedema, hematoma, and "eggplant deformity".[2,3] Presence of haematoma, rolling sign and a palpable tunical defect are usually considered pathognomonic features of penile fracture.[4] The incidence of urethral injury is significantly higher in the USA and Europe (20%) than in Asia, the Middle East, and the Mediterranean region (3%), probably due to the different aetiology-intercourse trauma

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instead of self-inflicted injury.[3,5–8] Proper history taking and thorough skilful clinical examination is adequate to establish diagnosis of fracture penis, however in case of diagnosis dilemma one can take the help of ultrasonograpy and MRI.[9] In case of voiding dysfunction or blood at the meatus, a preoperative retrograde urethrography or urethroscopy during surgical exploration should be considered. Immediate surgical exploration, evacuation of hematoma, control of bleeders, and repair of the tunica tear is the present trend in management.[10] Conservative therapy restricted to uncomplicated cases is also useful in selected cases. An analysis of the clinical presentation, diagnosis, management, and outcome of 45 cases that presented to our centre over the last 6 years is the purpose of this study.

2. Material and Methods

Study location- Veer Surendra Sai institute of medical science and research, Burla, Odisha.

Study population- Hospital based study. It consists of all the patients admitted in the department of Urology or general surgery, VIMSAR, Burla with the clinical features of penile fracture. Those patients with previous history of erectile dysfunction, impotence, psychiatric illness or old history of injury to penis are excluded from the study.

2.1. Operational definitions

Outcome, exposure.

2.2. Study type

Descriptive study.

2.3. Study design

Prospective observational study.

2.4. Study period

From 1^{st} February 2012 to 28^{th} February 2018.

2.5. Data collection tools

Data collected by taking history of the patient in the form of in-depth interview by the investigators face to face at the time of admission are as follows; age distribution, marital status, nationality, initiating cause of fracture(sexual intercourse, masturbation, rolling over, blunt trauma), time interval between the event and presentation to our hospital (within 6 hours, vs after 6 hours), presence of characteristic cracking sound, previous history of erectile dysfunction, impotence, psychiatric illness or injury to penis. The clinical findings are recorded under following headings: swelling, discoloration, detumesence, pain, noise, hematoma, curvature, presence of bleeding per urethra. The treatment provided is recorded as either surgical or conservative treatment. Operative findings were recorded as size of tear, site of tear, whether associated with urethral injury or not. Duration of hospital stay is recorded. The complications recorded as follows: pain, edema, infection, plaque, curvature, erectile dysfunction, cordee, urinary symptoms, resurgery and aneurysm formation. For proper analysis, complications were grouped as early and delayed. Complications that occurred within 2 weeks postoperatively were grouped as early (Wound infections and skin necrosis) and later than 1 month were grouped as delayed (erectile dysfunction, painful erection, and penile deviations). Erectile dysfunction was crudely assessed on follow-up by a questionnaire as to be good, mild to moderate and poor erection (insufficient for intercourse).

2.6. Sample size -30

Measures- The purpose of the study was informed to each participant and they were also informed of the fact that each of them was free to withdraw any time. Assurance was given to them concerning confidentiality. A written informed consent was obtained from each participant and their mail-id obtained from them. All patients underwent thorough clinical examination on admission. Presence of urethral bleeding and other associated injuries were investigated. Apart from routine blood tests, a coagulation profile was done for all patients. Ultrasound examination and Doppler study were done in selective cases only. Most of the time, clinical diagnosis was enough to decide on the management option. Every patient underwent surgery under spinal anaesthesia apart from two apprehensive patients who required general anaesthesia; exploration of the fracture site was carried out by a degloving subcoronal incision. The hematoma was evacuated and any bleeding vessels were ligated and the site of tunica defect located, measured, and then repaired by using synthetic, absorbable, inverted knot sutures. We routinely used 3-0 PDS sutures for all our cases. After repair, artificial erection was induced to make sure there was no leakage. A Foleys catheter 16F was inserted and retained for 2 days postoperatively. All cases received antibiotics for 5 days postoperatively with sedation for 24–48 h. None of the patients received any anti erectile medication. Conservative treatment was in the form of cold compress with anti-inflammatory drugs along with antibiotic coverage. All patients were followed up a week after discharge and then every 3 months up to 1 year. Four patients can be followed up to 6 months only,

Sexual function of each patient were evaluated a 3 month follow up. Evaluation was done by using International index of erectile function-5 (IIEF-5) As all of our paint gave history of having partner. 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).[11] The penile doppler study was performed in selected cases to measures Peak systolic

velocity(PSV), End diastolic velocity (EDV) and Resistive index (R,I). RI values >0.9 have been associated with normal penile vascular function, while RI values <0.75 are consistent with veno-occlusive dysfunction.[12]

2.7. Statistical analysis

SPSS 9.0 software for Windows was used for analysis of the data.

3. Results

Table 1: Causes of penile fracture

Cause	Number	Percentage
Sexual intercourse	22	73.33
Masturbation	5	16.66
Rolling over	2	6.66
Blunt trauma	1	3.33

Table 2: Presentation of penile fracture

Presentation	Number	Percentage
Swelling	29	96.66
Discolouration	25	83.33
Noise	10	33.33
Detumescence	14	46.66
Hematoma	12	40
Pain	29	96.66
Curvature	8	26.66
Urethral bleed	1	10
Time from trauma to Intervention	(0-24hours)-23 (>24 hours))-7	76.66(<24 hours) 23.33(> 24 hours)

Table 3: Operative finding

Size of tear	Range	Mean
5mm	2-8mm	6
Site of tear	Number	Percentage
Left corpora cavernosa	12	26.66
Proximal	6	25
Mid	4	25
Distal	2	50
Right corpora cavernosa	16	40
Proximal	7	33.33
MID	7	16.66
Distal	2	50
Both corpora	1	3.33
Unknown (Conservative Treatment Without Imaging)	1	3.33

4. Discussion

As mentioned earlier fracture penis is an uncommon urological condition. Although it has varied aetiologies, its clinical manifestations are relatively uniform among different cases. Between these 6 years of study duration 30 patients of penile fracture were studied and followed up.

Table 4: Hospital stay and complications in patients managed operatively

Duration of hospital stay	2-5 days	Mean-3.5 days
Pain	5	20.83
Wound oedema	**5**	20.83
Infection	5	20.83
Plaque	Nil	
Curvature	1	4
Erectile dysfunction	2	8.33
Mild chordee	2	8.33
Urinary disorder	3	12.5
Reoperation	Nil	
Aneurysm	1	4.16

Table 5: Evaluation of sexual function at 3 month interval-

IIEF-5 Severity	Number of patients
No ED (22-25)	28
Mild ED (17-21)	1
Mild to moderate ED (12-16)	1
Moderate ED (8-11)	0
Severe ED (5-7)	0

The usual cause of penile fracture is abrupt bending of the erect penis by blunt trauma, which may occur during sexual intercourse, masturbation, rolling over in the bed, or during the practice known as 'taghaandan,' in which the erect penis is pushed down to achieve detumescence, resulting in a click.[2] Out of 30 patients 22(73.33%) had sustained injury during sexual intercourse followed by 5(16.66%) patients where masturbation was the cause, 2(6.66%) patient had rolling over erect penis, and one (3.33%) had blunt trauma over erect penis. Our finding is similar to many published literatures with sexual intercourse being the most common cause of penile fracture.[11,13,14]

One of our objectives was to analyse the various clinical manifestation of fracture penis. Swelling over the penis and pain were the most common clinical features, seen in 29(96.66%) patients, erythematous discolouration was present in 25(83.33%), 10(3.33%) patients had history of characteristic cracking noise, detumescence, haematoma, curvature and bleeding per urethra were found in 14(46.66%), 12(40%), 8(26.66%) and 1(3.33%) cases respectively. However RS mohapatra et al in there study have found rapid detumescence (95%) as most common presentation followed by swelling (90%), characteristic popping sound in 85% cases and pain was present only among 50% cases.[14] B Patil et al in their study found penile oedema as most common presentation and typical click were present only in 22.1% cases.[11]

23 (76.66%) patients presented to the hospital within 24 hours of injury, 23.33% presented after 24 hour of

surgery. In a study by B. Patil et al, only 38.88% (7/18) patients present within a day. El-Assmy et al. In their study found 81% patients presented within 24 hr. The delay in presentation may be due to feeling of shame or hesitancy out of embarrassment.

29(96.66%) patients were subjected to surgical intervention. The per-operative findings were as follows: the mean size of tear was 6mm with a range of 2 to 8 mm. Right side corpora cavernosa tear (n=12, 40%) were more frequent than the left side (n=8, 26.66%). the site of injury were as follows; most common being proximal shaft (48.2%), mid shaft (34.48%) and distal shaft (13.79%). many previous study in literature have shown proximal shaft as the most common site of tear.[11,14] The incidence of urethral injury varied from 0% to 3% in reports from Iran, Persian Gulf countries, and Japan to 20%–38% in reports from European countries.[12,15] some of the literatures describe it in up to 10-33% of cases of penile fracture.[12] However in our study none of the patient had associated urethral injury.

The mean duration of hospital stay was 3.5 days with a range of 2-5 days.

In post-operative period 5(20.83%) patients had pain and surgical site infection along with partial skin necrosis. 28 patient came for follow up at 3 month period. 26 patient had IIef-5 score between 22-25;i.e. no erectile dysfunction. One patient had mild erectile dysfunction with IIEF-5 score of 19, and one had mild to moderate ED with score of 14. Delayed complications e.g. erectile dysfunction, curvature and chordee were observed in 2(6.66%), 1(3.33%) and 2(6.66%) cases. One patient which was managed conservatively had chordee and no other early or delayed complication. The number of complication in our study is less as compared to many previous studies. B. Patil et al in their study found that 44.4% had post-operative wound infection and erectile dysfunction. 11.11% had chordee.[11] Early presentation to the hospital may be the reason for fewer complications in the patients in our study.

5. Conclusion

History and physical examination is the most important diagnostic tool for penile fracture. Early surgical repair achieves significantly better outcomes compared to conservative management or delayed surgery.

6. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.

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None.

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