Penile Fracture - Comparison of Two Tertiary Centres (GMC Srinagar vs. GMC Jammu) - An Observational Study

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ABSTRACT

BACKGROUND

Penile fracture is defined as the traumatic rupture of tunica albuginea on one or both sides leading to detumescence and deformity of penis. It's a distressing condition for the patient and patient often tries to conceal history. Treatment is mainly via surgical repair. People are hesitant to seek medical advice and often conceal the proper history this leads to delayed visits by patients sometimes even after days. Sometimes they even come with an entirely different complaint and reveal the real issue later on. Various causes of fracture penis include masturbation, sexual intercourse, forceful bending of erect penis to micturate, turning on bed over an erect penis.

METHODS

This was a prospective observational study that was carried out at two different tertiary care hospitals and twenty-seven patients were enrolled with history of penile fracture. All the data was carefully collected and tabulated and early all the patients were surgically managed.

RESULTS

There were a total of twenty seven patients with majority of patients belonging to age group of 25 – 50 years. Mode of trauma was mostly sexual intercouse. Twenty-five patients were surgically managed while two patients were conservatively managed as they did not give consent for surgery. Post surgery major complications included pain, erectile dysfunction, deviation and discomfort during sexual intercourse.

CONCLUSIONS

Penile fracture is an urological emergency which is generally managed by general surgeon. As it is a rare type of trauma and many general surgeons do not have experience to repair it, this often leads to many complications. Repair of penile fracture has excellent outcomes however it should be repaired very meticulously as it can lead to dreaded complications.

KEYWORDS

Penile fracture, Tunica Albuginea, Urethral Tea

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BACKGROUND

Penile fracture also known as faux pas du coit is defined as the traumatic rupture of tunica albuginea (fibrous envelope that covers the corpora cavernous) of one or both sides. During erection tunica albuginea becomes quite thinned out and increase in pressure leads to its transverse tear which is often unilateral.[1,2] However, bilateral tears have also been reported in literature.[3,4,5] Associated injury of urethra or corpus spongiosum is not uncommon.[6,7] Penile fracture although a urological emergency is often managed by general surgeons. As it is a rare condition, most of the general surgeons do not have adequate exposure to it. Also, it is a very embarrassing and distressing condition for the patient owing to the taboo that comes with it especially when it comes to developing countries like India. People are hesitant to seek medical advice and often conceal the proper history.

This leads to delayed visits by patients sometimes even after days. Sometimes they even come with an entirely different complaint and reveal the real issue later on.[8] Various causes of fracture penis include masturbation, sexual intercourse, forceful bending of erect penis to micturate, turning on bed over an erect penis etc. Following the trauma patient often gives history of a popping or cracking sound followed by detumescence and deformity commonly known as eggplant deformity.[9] Treatment usually is in form of surgical exploration followed by repair of the tear. Various approaches to surgical treatment include a subcoronal incision, inguinoscrotal incision or a longitudinal incision directly above the fracture site.[10,11,12,13]

Anatomy

The penis is the male organ of copulation. It is made up of: (a) a root or attached portion and (b) a body or free portion.

Root of Penis

The root of the penis is located in the perineal pouch (superficial) and is made of three masses of erectile tissue, namely the two crura and one bulb. The bulb is attached to the perineal membrane in between the two crura. It is covered by the bulbo-spongiosus. Its deep surface is pierced (above its centre) by the urethra, which traverses its substance to reach the corpus spongiosum.

Body of Penis

Penis is completely surrounded by skin. As its in continuity with the root in front of the lowermost part of symphysis pubis. It is made of three elongated muscular masses of erectile tissue. At the period of erection of the penis these structures become engorged with blood leading to considerable amount of enlargement. These masses are the right and left corpora cavernosa, and a median corpus spongiosum.

Both the corpora cavernosa are formed from the forward continuations resulting from the formation of crura and are throughout the length are in close apposition. The corpora cavernosa does not reach to the end of the penis as both of these ends under cover of the penis in a blunt extremity (conical in shape).

They are enveloped by a strong fibrous covering known as the tunica albuginea. The tunica albuginea is made of superficial longitudinal fibres enclosing both the corpora, and deep circular fibres that encompasses each corpus separately and also form a median septum. Corpus spongiosum is the forward prolongation of the bulb of the penis.

The terminal part is expanded to shape into a cone shaped enlargement, called the glans penis. All around whole length it is pierced by the urethra. Like the corpora, it is also surrounded by a fibrous sheath.

Penile erection is completely and purely vascular phenomenon. Turgidity and engorgement of the penis during the phase of erection is contributed to by the following factors.

A). Helicine arteries becomes dilated which ejects an enormous increased amount of arterial blood in the cavernous crevices of the corpora cavernosa. Blood circulation is also pushed into the corpus spongiosum and in the glans of penis by their corresponding arteries, progressively these spaces of the erectile tissue gets filled up resulting in the penile enlargement.

B). The enlarged veins press the veins thus preventing outflow of blood through them. Chiocavernosus muscles contraction probably has the similar effect.

C). Stretching of deep fascia by the expansion and engorgement of the corpora cavernosa and to lesser extent contributed by corpus spongiosum which restricts further enlargement of the penis. Progressive blood flow increases the pressure within the erectile muscular tissue which leads to rigidity and erection of the penis.

D). Parasympathetic nerves (nervi erigentes, S2, S3, S4) controls the erection.

Veins Supplying the Penis

The venous drainage of penis goes into superficial external pudendal veins which receives blood from branches of superficial dorsal vein of penis that lies in the superficial fascia that divides into right and left branches before draining into external pudendal vein. The dorsal deep vein lies adjacent into the deep fascia. Proximally it passes into the gap that lies between perineal membrane and the symphysis pubis that drains all the venous blood into the veins of the prostatic plexus. Rest of the veins draining the penis accompany to the arteries.

Nerve Supply of the Penis

Sensory nerve supply is derived from the dorsal nerve of the penis and the ilioinguinal nerve. The muscles of the penis are supplied by the perineal branch of the pudendal nerve 2. The pelvic plexus via the prostatic plexus provides the autonomic pathway.

The sympathetic nerves are vasoconstrictor, and the vasodilators are the parasympathetic nerves (S2, S3, S4).

The autonomic fibres are distributed through the branches of the pudendal nerve.

Lymphatic Drainage

Lymphatics from the glans drain mainly into the deep inguinal nodes which is also called gland of Cloquet. Lymphatics from the remaining parts of of the penis drain into the superficial inguinal lymph nodes.

Objectives

- Primary - To observe various characteristics of penile fracture with respect to demography, clinical profile and outome.
- Secondary - To compare the observations between two tertiary care centres.

METHODS

This was a prospective observational study that was conducted over a period of two years in two institutions at two regions of Jammu and Kashmir namely Government Medical College, Jammu and Government Medical College, Srinagar respectively from 1st September 2017 to 31st August 2019. All cases of penile fracture which came to the Emergency Surgery Department of these institutes were added in the study. A total of 27 patients were reported in the study. All patients were admitted to the causality ward and a detailed history and examination was carried out. Patients were subjected to all base line investigations including hemogram, complete blood counts, kidney function tests, routine urine investigations, blood glucose and electrocardiogram (ECG). Diagnosis was confirmed by an ultrasonography in some cases where history was not proper. In cases where there was a doubt of urethral injury, a retrograde urethrography was done. All patients with clinical and radiological diagnosis of penile fracture were included in the study. Patients with underlying comorbidity, and patients with coagulopathy were excluded from the study.

Patients were evaluated on the basis of age, cause of fracture, time since the injury, marital status, clinical approach, operative findings, and outcome. Few patients were managed conservatively while majority underwent surgical repair. A detailed consent was taken prior to the surgical procedure and patients were made aware of all the possible complications. Operative repair was done under spinal anaesthesia. Patients were catheterised prior to the procedure. Subcoronal incision approach was used in all patients which provides a better view of all corpora and urethra. Defect was closed with polydioxanone suture which has delayed absorbability and is in a continuous fashion with interrupted knot. Post procedure patients were kept on erection suppressing medications such as ethyl estradiol and phenobarbitone in addition to antibiotics and analgesics. Patients were followed weekly for one month and then monthly for six months.

Statistical Evaluation

Data was analysed with chi-square test using statistical package for social sciences (SPSS) version 22.

RESULTS

This study was carried out at two different institutes over a period of two years and 27 patients were enrolled in this study with 08 patients from GMC Jammu and 19 patients from GMC Srinagar.

Age Distribution

The youngest patient in this study was 19 years old while the eldest was 62 years. Majority of the patients belonged to the age group of 25 to 50 years. 19 patients were married while 08 were unmarried (Table 1).

Age Group	GMC Jammu		GMC Srinagar		Total
	Married	Unmarried	Married	Unmarried	
< 25 Years	01	02	02	02	07
25 – 50 Years	04	00	07	04	15
>50 Years	01	00	04	00	05
Total	06	02	13	06	27

Table 1. Age Distribution of Patients

Demography

In this study, we came across the findings that the cases of penile fracture were more in urban areas than in rural areas with married people predominance as shown below. Among 6 married patients in Jammu, 5 were belonging to rural area and similarly among 13 married patients in Srinagar, 9 were married. P – value was 0.3

Demography	GMC Jammu		GMC Srinagar		Total
	Married	Unmarried	Married	Unmarried	
Rural	01	01	04	01	07
Urban	05	01	09	05	15
Total	06	02	13	06	27

Table 2. Demography of the Patients

Clinical Profile

16 patients reported to causality within 12 hours, 7 patients reported between 12 and 24 hours while 4 reported after 24 hours following trauma. There were different causes attributed to penile fracture but the majority of cases had trauma while sexual intercourse.

	Parameters	GMC Jammu	GMC Srinagar	Total	P-Value
Mechanism of injury	• Sexual Intercourse	05	11	16	0.9
	• Masturbation	01	03	04	0.76
	• Bending over on erect penis	01	04	05	0.55
	• Forceful bending	01	01	02	0.32
Clinical history	• Popping sound	04	12	16	0.1
	• Visible deformity	08	19	27	0.88
	• Detumescence	08	19	27	0.24
	• Hematuria	00	02	02	0.77
	• Urinary retention	00	01	01	0.6
Time interval	• < 12 Hours	05	11	16	0.44
	• 12 – 24 Hours	02	05	07	0.21
	• > 24 Hours	01	03	04	0.74

Table 3. Clinical Profile

The second most cause was masturbation followed by trauma due to accidental bending. 16 Patients gave the history of popping sound while all the patients gave history of visible deformity and detumescence. 2 patients gave history of bleeding per urethra and 1 patient gave history of urinary retention (Table 2).

Peri-Operative Course

Retrograde urethrography was done in these patients to confirm the diagnosis of urethral tear. 25 patients were surgically managed while 02 patients were managed conservatively as they didn't give consent for surgical intervention. Intraoperatively it was seen that out of twenty-five patients, twenty-one patients had unilateral tear (thirteen on right side and eight on left side) in tunica albuginea, three patients had bilateral tear while one patient had associated tear of corpora also. Urethral injury was also seen in two patients. Urethral tear was repaired successfully in both these cases during the procedure. Patients who were conservatively managed later developed penile deviation. Post-operative period was uneventful in patients with surgery. 4 patients complained of pain in follow up period which was managed by analgesics. 2 of the patients suffered from erectile dysfunction while one had penile deviation leading to discomfort while sexual intercourse. Erectile dysfunction self-resolved in these two patients. Rest of the patients did well in the follow up period.

Complications	GMC Jammu	GMC Srinagar	Total	P - Value
Pain	01	03	04	0.81
Erectile dysfunction	01	01	02	0.39
Discomfort	00	01	01	0.75
Penile deviation	01	02	03	0.09
Total	**03**	**07**	**10**	

Table 4. Post-Operative Complications

DISCUSSION

This was a prospective observational study that was carried out at two tertiary care hospitals of Jammu and Kashmir over a period of two years. We found majority of patients in the age group of 25 to 50 years which is attributable to the highest sexual activity in this age group. This was also seen in many previous studies in literature. Number of cases were more in Kashmir region as compare to Jammu, however when we look at previous literature of Kashmir region there has been a significant decrease in the number of cases of penile fracture.[14,15]

Tunica albuginea is a bilamilar structure and is about 2 mm in thickness in a flaccid state however its thickness substantially decreases to 0.25 mm during erection and certain resistance to an erect penis at this state leads to enormous pressure generally above 1500 mm of hg which causes the tear of tunica albuginea leading to penile fracture.[16,17] While there were many causes of this trauma, predominant cause remained sexual intercourse as described in the literature previously as well. Literature also attributes it to stressful sex as in extramarital affairs and with particular positions like women on top.[18,19,20] Visible detumescence and deformity was seen in almost every patient of penile fracture. However, some patients did suffer from other complications such as hematuria and urinary retention which leads to increased morbidity in the patient and increased hospital stay. The time interval between the injury and arrival at hospital is also important variable as increased time interval leads to increased chances of morbidity. Although penile fracture is more of a clinical diagnosis, we found ultrasonography to be of great help in confirmation of diagnosis where proper history was not given by the patient.

Surgical repair was done in 25 patients eight of whom suffered from some form of complication in form of pain, erectile dysfunction, discomfort during sexual intercourse, penile deviation etc. However, every complication was managed conservatively. Repair of penile fracture has excellent outcomes however it should be repaired very meticulously as it can lead to dreaded complications.

The credentials that alter the outcome after surgery have significantly been attributed by a time delay of > 24 hours with inclusion of post-operative wound infection, erectile dysfunction a months and post-operative hospital stay. Although the incidence of chordee at 6 months did not correlate with time delay.[21] Post-operative antibiotics, erection inhibitors, anti-inflammatory agents and compressive bandage are surgeon dependent.[22] Various medications, like antiandrogens or sedatives have been used to evade erections and some recent research still advocate their use.

However, it has been suggested that these are unnecessary because post-operative pain is most likely to supress rigid erection.[23] Similar observations were encountered by Leonardo O. Reis[24] where they postulated that pain occurs during intercourse and clinically penile deviation becomes evident. Two of their patients (4.8%) had significant erectile dysfunction and one of them was treated by penile prosthesis and another one was subjected to PDE-5 inhibitor, and four (9.5%) among those patients presented minor amount of deviation of penis without significant clinical impact, with evidence of minor negligible penile curvature, not interfering with the penetration, usually < 20° degree. El Atat et al.[25] interpreted their experience with 300 penile fracture cases and concluded that complications in 40 patients (13.3%) which included 14 (23.3%) developed penile curvature, 10 had experienced penile nodules (3.34) and two among those suffered from erectile dysfunction (0.6%) which correlates with our experience as well. After discharging all the patients should be advised to abstain from sexual intercourse for a time of at least 2 months. They should also be advised for complications viz erectile dysfunction, curvature of penis, and fistula in urethra. Curvature of penis occurs in these patients with usually delayed presentation.[25]

In our study, we did not find any case of urethral injury but in literature there are cases found like that as the amount of cases associated with penile fracture along with urethral injuries ranges from 10 % and 20 % of reported cases. Blood from or at the meatus, difficulty to void, or blood in urine are the features of urethral trauma. Patients with both corporeal ruptures should be investigated for urethral trauma. Retrograde urethrography is advised in

suspected cases of penile fracture when there is evidence of associated urethral trauma. Partial urethral trauma can be managed by urethral catheterization in situ, primary closure, or suprapubic cystostomy (SPC). Complete urethral rupture can be treated with primary reanastamosis, stenting or graft interposition.[25] In this study we came across the findings that the cases of penile fracture were more in urban areas than in rural areas with married people predominance as shown below. Among 6 married patients in Jammu, 5 were belonging to rural area and similarly amomg 13 married patients in Srinagar, 9 were married, regarding this finding in our study. More study and research is needed regarding the same.

CONCLUSIONS

Penile fracture is an urological emergency which is generally managed by general surgeon. As it is a rare type of trauma and many surgeons do not have experience to repair it, this often leads to many complications. While penile fracture remains a clinical diagnosis, we recommend ultrasonography in cases with atypical presentation and suspicious diagnosis. This series supports the early operative intervention in cases of penile fracture to achieve excellent outcomes. We also suggest an active follow up of such patients to keep a vigil on the incidence of complications such as erectile dysfunction and manage them accordingly.

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