

## Original Research Article

# A STUDY ON SURGICAL INTERVENTION IN CASES OF PENILE FRACTURE: RECOVERY AND IMPACT ON LONG TERM OUTCOMES

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## ABSTRACT

**Background:** Among the few emergencies in urology practice, penile fracture is rare but one of them. Clinically suspicious cases needs prompt careful evaluation and urgent early surgical intervention in selected cases to remove hematoma, to restore penile anatomy and finally to prevent long-term complications. This study emphasizes importance of careful accurate diagnosis, early management and focusing on associated injuries and postoperative complications.

**Materials and Methods:** This study involved 24 patients with penile fracture which were fully evaluated by physical examination and penile Doppler study. MRI study and Retrograde urethrogram were used in doubtful cases with suspicious associated injuries. Injury mechanisms included sexual intercourse (20 cases), fall (3 cases), and assault (1 case). Penile defects were repaired in the form of corporoplasty using Vicryl 3-0. Mean operative time was two hours under spinal anesthesia. Seven patients required additional urethral repair using PDS 3-0 with catheterization. Aseptic sterile dressing were done.

**Results:** The mean age was 30 years, mostly presented within 24 hours of event. Corporal defects were less 1 cm, between 1-2 cm and more than 2 cm in 8, 13 and 3 patients respectively. Vigorous sexual activity remains the main causative factor which presented in 20 out of 24 patients. Postoperative complications included wound infection in 2 cases which were managed with dressings and discharged within five days. Erectile dysfunction was reported in 4 patients, all of them had delayed presentation. Additionally, one patient with urethral injury developed a urethral stricture at six months which was managed with urethral dilatation.

**Conclusion:** This study highlights the effectiveness of prompt surgical intervention in managing penile fractures, particularly for preventing complications like erectile dysfunction associated with delayed presentation. The findings support early repair for optimal recovery and underscores the need for further research on the impact of presentation timings on long-term outcomes.

**Keywords:** Penile fracture, sexual penile trauma, straddle injury, corporoplasty, penile curvature.

## INTRODUCTION

Being a rare but serious urological emergency, penile fracture typically occurs due to trauma to an erect penis, most commonly during sexual

intercourse. The condition is characterized by a rupture of the tunica albuginea, the fibrous covering of the corpora cavernosa, which is stretched thin during erection. This injury can lead to significant pain, swelling, and hematoma. If untreated, may

result in long-term complications such as erectile dysfunction or penile curvature. Immediate surgical intervention is crucial to repair the damage, restore normal penile function and prevent long-term morbidity.

Penile fractures are more common in men who are sexually active, particularly in their 20s to 40s, an age group characterized by high sexual activity. However, they can also occur in older individuals, but less frequently. Most cases are reported during vigorous sexual intercourse, especially when the penis slips out of the vagina and strikes the pubic bone or perineum. This is often referred to as the “misdirected thrust.” Other causative factors include manipulation of the erect penis, rolling over onto an erect penis during sleep or trauma during masturbation.

Apart from sexual intercourse, a small percentage of penile fractures result from non-sexual activities such as accidents, sports injuries, or blunt trauma. In regions where traditional or cultural penile “snapping” practices exist, the incidence of penile fractures may be relatively higher. In most of patients there is presence of typical triad which includes popping sound, penile hematoma and penile detumescence with deviation.

The surgical management of penile fractures involves repairing the ruptured tunica albuginea and addressing associated injuries, particularly urethral involvement which occurs in up to 20% of cases. Urethral injuries are more common when the fracture involves the ventral side of the penis. Early surgical intervention has been shown to reduce the risk of complications such as erectile dysfunction, penile curvature, and painful erections.

This study focuses on the evaluation of surgical techniques employed in penile fracture repair, the associated complications and long-term patient outcomes. It also examines the demographic profile, common causative factors and clinical presentations of patients treated for penile fractures at our institution. Understanding these aspects can help optimize the management of this urological emergency and improve patient care outcomes.

## **MATERIALS AND METHODS**

In this study we included total 24 patients who presented with penile trauma at department of Urology, B J Medical College, Ahmedabad over two years from January 2023 to December 2024. All patients were evaluated by asking demographic data, mechanism of injury, time of presentation and complications were recorded. Most patients presented with a distinct “popping” sound during the injury, followed by a sudden loss of penile erection and the appearance of a penile contusion. In physical examination, swelling, discoloration, and tenderness of the penis were noted. All required preoperative blood investigations were done complete blood count (CBC), Renal function tests

(RFT) with electrolytes, Liver function tests, bleeding profiles, blood grouping & viral markers such as HIV and HbsAg. Ultrasound (USG) of the local part confirmed the defect in the tunica albuginea of the corpora cavernosa and associated hematoma. Penile doppler study was utilized to assess vascular injury and its extent. Occasionally MRI Study and / or retrograde urethrogram were done to rule out associated urethral injuries.

After careful confirmed diagnosis, surgical intervention were offered to patients having significant corporal defect. Surgical management included the primary repair of corporal defect (Corporoplasty) using Vicryl 3-0 under spinal anaesthesia.

We follow the standard operative steps as mentioned below.

- Supine position.
- Painting and draping of local part using sterile technique.
- Circumferential penile incision, degloving of penis using sharp and blunt dissection.
- Expose both corpora cavernosa and corpora spongiosum.
- Blood clots were removed and meticulous hemostasis was achieved with electrocautery.
- Local irrigation done using normal saline and edges of tunica albuginea were minimally debrided.
- Corporoplasty was done using Vicryl 3-0 and associated urethral injury was repaired using PDS 3-0.
- Catheterization, subcutaneous tissue approximation and circumcision was done.
- Antibiotic ointment was applied and sterile penile dressing done.

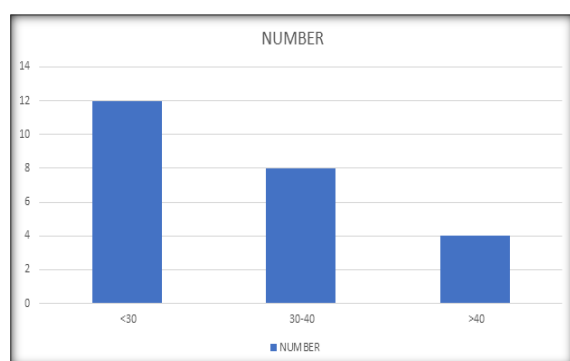
In post-operative period, Antibiotics, Analgesic and Anti-inflammatory drugs were given to all patients. After discharge patients were advised for dressing, catheter removal, and follow up visits as per schedule.

On follow up visits assessment of the success of surgical repair, incidence of postoperative complications and recovery of erectile function were done. The need for further interventions and long-term complications such as urethral stricture were evaluated.

## **RESULTS**

Out of 24 patients, majority of the patients were under 40 years with a mean age of 30 years, except 3 patients who were over 40 years of age. During study we found the mechanism of injury was predominantly due to sexual intercourse (n=20), followed by fall down injuries (n=3) and assault (n=1). Average BMI of all patients was 24.3 kg/m<sup>2</sup>. 5 of them had smoking history, 3 were diabetic and 2 were hypertensive. Age distribution in patients are as shown in Table-1. The mean age was 30 years, ranging from 18-45 years of age. 12 patients were

below 30 years, 8 between 30-40 years and 4 were more than 40 years of age.



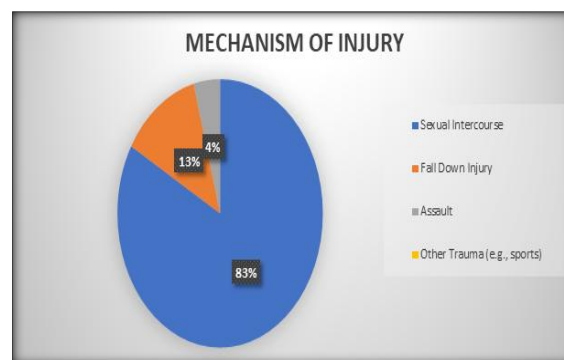
**Figure 1: Age Distribution**

On analysis of history given by patients, we found 17 patients out of total 24 patients presented within 24 hours of injury, 5 patients between 24-48 hours while only two patients presented after 48 hours of injury.

**Table 1: Presentation Timings**

Time of Presentation	Number of Patients	Percentage
Within 24 hours	17	70.83
24-48 hours	5	20.83
After 48 hours	2	8.33

On evaluation we also found the various causative factors for mechanical penile leading to penile fracture. Vigorous sexual activity was the most common causative factor, present in 20 out of 24



**Figure 2: Modes of Injuries**

On evaluation we found different sizes of corporal defect irrespective of causative factors. In this study we got corporal defect between 1 cm to 2 cm in 13 out of 24 patients. In 8 patients we found corporal defect less than 1 cm. In remaining 3 patients corporal defect was more than 2 cm in size as shown in table-3 below.

**Table 3: Causative factors**

Mechanism of Injury	Number of Patients (24)	Percentage (%)
Sexual Intercourse	20	83.33
Fall Down Injury	3	12.5
Assault	1	4.1
Other Trauma (e.g., sports)	0	0

**Table 4: Corporal defect Size**

Sr no	Defect size	Total no
1	< 10 mm	8
2	10-20 mm	13
3	>20 mm	3

Below are pictures of surgical procedures showing the presenting deformity, corporal defect, corporal repair (corporoplasty) and final outlook on completion of procedure.



**Deformity**



**Corporal Injury r**



**Corporal repair**



**Final outlook**

The comprehensive summary of the operative process, perioperative management, and postoperative outcomes is as following

**Operative Duration:** The average time for surgery is around 2 hours, although the duration can vary between 2 to 3.5 hours depending on case complexity.

**Anaesthesia Type:** All procedures were performed under spinal anaesthesia, ensuring effective pain control during the surgery.

**Circumcision and Urethral Repair:** Every patient underwent circumcision. In cases where a urethral repair was necessary (noted in 7 patients), PDS 3-0 suture material was used to ensure a secure and precise repair.

**Antibiotic Regimen:** To prevent postoperative infections, a combination of Ceftriaxone and Amikacin was administered. This regimen was maintained for 5 days after the surgery.

**Blood Transfusion:** Only one patient required a blood transfusion during the operative process, indicating that blood loss was generally well-controlled.

**Intraoperative Complications:** No intraoperative complications were reported, highlighting a safe surgical process.

**Catheter Management:** For patients without urethral injury, the catheter was removed after 2 days. However, in cases where there was urethral injury, the catheter was kept in place for 14 days to ensure proper healing and minimize further complications.

**Hospital Stay:** Patients were typically hospitalized for an average of 4 days, with the overall range being between 3 to 5 days.

**Postoperative Care and Follow-up:** All patients received appropriate counselling regarding their procedure and postoperative care. Follow-up was required for every patient to monitor recovery and address any concerns.

**Long-term Complications:** During long-term follow-up, some complications were observed. 4 patients experienced erectile dysfunction, and 1 patient developed a urethral stricture. These outcomes suggest that while the procedure is generally safe, careful long-term monitoring is crucial.

**Table 5: Our study results and outcomes**

Variable	Value
Mean Operative Duration	2 hours
Operative Duration Range	2-3.5 hours
Anaesthesia Type	Spinal anaesthesia
Circumcision Performed	Yes (all cases)
Urethral Repair (n=7)	PDS 3-0
Antibiotics Used	Ceftriaxone and Amikacin
Blood Transfusion Needed	1 patient
Intraoperative Complications	None reported
Catheter Removal( Without urethral injury)	2 days
Catheter Removal( With urethral injury)	14 days
Average Hospital Stay	4 days
Range of Hospital Stay	3-5 days
Antibiotic Therapy Duration	5 days (postoperative)



Follow-up Required	100%
Counselling Provided	Yes (all patients)
Long term complications	4 Erectile dysfunction, 1 Urethral stricture

**Following complications were observed in both the short and long term during study:**

#### Short-Term Complications

1. Wound Infection (2 patients, 9.1%) A small proportion of patients developed postoperative wound infections. These infections were managed effectively using antibiotic therapy.
2. Severe Pain (3 patients, 13.6%) While postoperative pain is expected, three patients experienced severe pain requiring additional analgesics for adequate relief.
3. Urinary Retention (1 patient, 4.5%) One patient developed urinary retention postoperatively. This was successfully managed with temporary catheterization, resolving the issue without further complications.

#### Long-Term Complications

1. Erectile Dysfunction (4 patients, 18.2%) Erectile dysfunction was reported in four patients.

However, two of them showed significant improvement and complete resolution within six months.

2. Urethral Stricture (1 patient, 4.5%) One patient developed a urethral stricture postoperatively, which was managed using urethral dilation, preventing further complications.
3. Penile Curvature: No cases of postoperative penile curvature were reported, indicating no structural deformities resulting from the procedure.

Most complications were manageable with appropriate medical interventions. Short-term issues like infection and pain were effectively treated, and some long-term complications, such as erectile dysfunction, showed improvement over time. Continuous follow-up remains essential to monitor and address any delayed complications.

**Table 6: Postoperative Complications**

Complication	Number of Patients	Percentage	Notes
<b>Short term</b>			
Wound Infection	2	9.10%	Treated with antibiotics
Pain (severe)	3	13.60%	Required additional analgesics
Urinary Retention	1	4.50%	Resolved with catheterization
<b>Long term</b>			
Erectile Dysfunction	4	18.20%	Resolved in 2 patients by 6 months
Urethral Stricture	1	4.50%	Managed with dilation
Penile Curvature	0	0	-

**Table 7: Final Outcomes**

Outcome	Number of Patients	Percentage	Notes
Satisfactory Recovery	23	95.83	Complete functional recovery achieved
Need for Further Intervention	1	4.16	Due to persistent stricture
Follow-up Duration (average)	6 months	-	-
Patient Satisfaction	High in 95% of cases	-	-

Final outcomes of our patients were as shown in table-7 above:

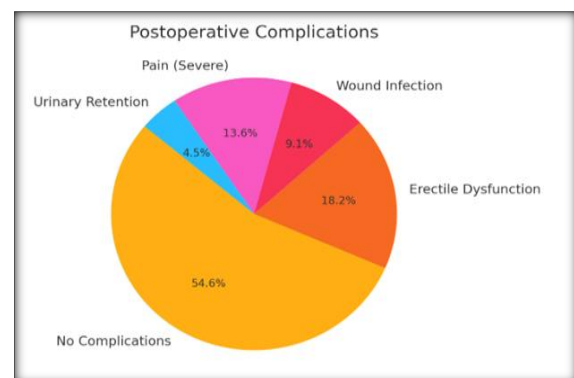
**Satisfactory Recovery:** Nearly all patients (23 out of 24, or 95.83%) experienced a complete functional recovery following the procedure. This indicates that the vast majority of patients returned to normal function without ongoing issues.

**Need for Further Intervention:** Only 1 patient (4.16%) required an additional intervention due to a persistent stricture. This isolated case highlights the importance of follow-up care to promptly address any complications that may not resolve with initial treatment.

**Follow-up Duration:** Patients were monitored for an average duration of 6 months after the procedure, allowing adequate time to evaluate both short-term and long-term outcomes.

**Patient Satisfaction:** Patient satisfaction was notably high, with 95% of cases reporting a high level of satisfaction with the procedure and its outcomes.

Overall, these outcomes demonstrate a high success rate for the procedure with minimal need for additional interventions, reinforcing the efficacy and safety of the treatment approach when coupled with diligent follow-up care.



**Figure 2: Complications**

## DISCUSSIONS

The outcomes of our study on the surgical management of penile fractures provide several key insights into patient outcomes, surgical techniques, and associated complications. The findings underscore the importance of prompt evaluation, early surgical intervention and careful postoperative management in optimizing recovery.

The group of 24 patients had a mean age of 30 years, with all individuals being under 40 except for 3 patients. This age distribution is consistent with existing literature, which indicates that penile fractures predominantly occur in younger males, particularly during sexually active years.<sup>[1]</sup> Zargooshi, J. (2000) study showed early surgery within 24 hours had lesser (<5%) of penile curvature and less chances of ED. Our results show similar results. The primary mechanism of injury was sexual intercourse (83.33%), followed by falls and assaults. This distribution highlights the need for awareness regarding the risks associated with sexual activities, which can lead to such traumatic injuries. Increased public awareness and education may help prevent such incidents.<sup>[2]</sup> Barros et al (2019) and Ibrahim, E. H., El-Tholoth, H. S., & Mohsen, T. (2008) showed early repair with proper suture selection (absorbable) minimizes long term issues of ED which is also the result of our study.<sup>[2,8]</sup>

All patients underwent surgical repair, with the defect in the corpora cavernosa closed using Vicryl 3-0 sutures, which provided adequate tensile strength for the repair. The additional urethral repairs in the seven cases of urethral injury used PDS 3-0 sutures, indicating a tailored approach to managing complex injuries. The mean operative duration of three hours aligns with reports from similar studies, suggesting that surgical complexity can vary significantly based on the nature of the injury.<sup>[3,4]</sup> N Eke (2002)'s study of penile fracture showed that the most common cause of penile fracture was sexual intercourse and penile manipulation which is adjunct with our study showing sexual intercourse as the most common cause of the condition.<sup>[4]</sup> All patients underwent circumcision as part of the surgical procedure, which is standard practice to facilitate access and reduce the risk of complications associated with future sexual activity.<sup>[5]</sup>

In terms of postoperative outcomes, our study reported a wound infection rate of 9%, which is relatively low compared to rates documented in the literature, often ranging from 10% to 30%.<sup>[5]</sup> This finding can be attributed to rigorous postoperative care protocols, including regular dressing changes and appropriate antibiotic use. The occurrence of erectile dysfunction in 4 patients (16.66%) postoperatively, particularly among those who presented later than 24 hours after the injury, reinforces the correlation between timely intervention and functional outcomes. Studies have

shown that delayed surgical repair can lead to vascular damage, impacting erectile function.<sup>[5]</sup> The psychological aspect of the injury may also play a role, and further studies exploring the psychological impact of penile fractures on sexual function are warranted.<sup>[6]</sup>

The case of urethral stricture developing six months post-surgery in one patient with an associated urethral injury emphasizes the importance of long-term follow-up. Urethral strictures are a known complication after urethral repairs, necessitating ongoing monitoring and management. Our finding of a single case of stricture highlights the need for close follow-up for patients with urethral injuries to address complications promptly.<sup>[6]</sup>

The timing of presentation significantly influenced outcomes in our cohort. 17 patients presented within 24 hours, resulting in satisfactory surgical outcomes. In contrast, the 5 patients who presented between 24–48 hours and 2 patients after 48 hours experienced poorer functional outcomes, particularly regarding erectile function. This supports the existing literature that emphasizes the importance of early surgical intervention in preserving erectile function and minimizing complications.<sup>[4,7]</sup>

Our findings further highlight the importance of a systematic diagnostic approach to penile fractures. While clinical presentation typically includes a history of trauma, a cracking sound, penile swelling, and hematoma, adjunctive imaging, particularly penile ultrasonography or MRI, can help confirm the diagnosis in equivocal cases.<sup>[7]</sup> As imaging was not used in our study, future studies should evaluate its role in improving diagnostic accuracy.

Additionally, circumcision, although routine in our cases, could be re-evaluated in future studies to determine its necessity in all repairs. While it can aid in access and reduce complications, patient preference and cultural factors should be considered.<sup>[7]</sup>

Erectile dysfunction, observed in 16.66% of cases, underscores the need for early rehabilitation. Psychological support and structured counseling for patients recovering from penile fractures may enhance postoperative sexual function. This is consistent with findings from recent literature that recommend addressing both physical and psychological components for better outcomes.<sup>[8]</sup>

While our study provides valuable insights, its relatively small sample size limits the generalizability of the findings. Future research with larger multi-centric cohorts could help validate these outcomes and provide more robust recommendations. Furthermore, incorporating validated tools like the International Index of Erectile Function (IIEF) for assessing long-term functional outcomes would standardize reporting and allow for comparisons across studies.

A longer follow-up period could also shed light on other potential late complications, such as Peyronie's disease, penile curvature, or delayed

urethral strictures. Such complications, although infrequent, can significantly affect the patient's quality of life and necessitate additional interventions.

Lastly, this study underscores the importance of developing preventive strategies, including awareness campaigns, to educate the public about the risks associated with certain sexual positions and activities that may predispose individuals to penile fractures. Emphasizing prompt presentation to a healthcare facility in case of injury should also be a priority to optimize functional and clinical outcomes.

## CONCLUSION

At the end of study we concluded, penile fractures are often underreported due to patient hesitation and limited awareness. Diagnosis is primarily clinical, with ultrasonography and Doppler study used selectively. Immediate surgical intervention remains the gold standard, reducing complications and improving outcomes. Public education and ongoing research are essential to improving awareness and patient care. Continued research is necessary to refine surgical techniques and improve

postoperative care, ultimately enhancing patient outcomes in this challenging area of urology practice.

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