

## Sexual Dysfunction

# Long-term Treatment Outcomes Between Surgical Correction and Conservative Management for Penile Fracture: Retrospective Analysis

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**Purpose:** Early surgical management is the standard of care for penile fracture. Conservative treatment is an option with recent reports revealing lower success rates. We reviewed the data and long-term outcomes of patients with penile injury submitted to surgical or conservative treatment.

**Materials and Methods:** Between January 2004 and February 2012, 42 patients with penile blunt trauma on an erect penis were admitted to our center. We analyzed the following variables: age, etiology, symptoms and signs, diagnostic tests, treatment used, complications and erectile function during the follow-up. One patient was excluded due to missing information. Thirty-five patients underwent surgical repair and 6 patients were submitted to conservative management.

**Results:** Mean follow-up was 19.2 months (range, 7 days to 72 months). The mean elapsed time from trauma to surgery was 21.3±12.5 hours. Trauma during sexual relationship was the main cause (80.9%) of penile fracture. Urethral injury was present in five patients submitted to surgery. Dorsal vein injury occurred in three patients with false penile fracture and concomitant spongiosus corpus lesion was present in three patients. During follow-up, 31 cases (88.6%) of the surgical group and four cases (66.7%) of the conservative group reported sufficient erections for intercourse, with no voiding dysfunction and no penile curvature. However, the remaining two patients (33.3%) from the conservative group developed erectile dysfunction and three patients (50%) developed penile deviation.

**Conclusions:** Surgical approach provides excellent functional outcomes and lower complications. Early surgical management of penile fracture provides superior results and conservative approach should be avoided.

**Keywords:** *Penis; Surgery; Therapy; Wounds and injuries*

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## INTRODUCTION

Penile fracture is defined as a rupture of the tunica albuginea of the corpus. The urethra and corpus spongiosum may also be affected. Causes include coitus, sudden forced flexion in the erection state, rolling over in bed, and masturbation. Patient history and physical examination play an important role in diagnosis. Penile fracture has a

typical clinical presentation that includes the report of a cracking sound, followed by penile detumescence and pain [1-3]. Physical examination usually includes edema, hematoma, and "eggplant deformity." In case of voiding dysfunction or blood at the meatus, a preoperative retrograde urethrography or urethroscopy during surgical exploration should be considered. The use of imaging techniques in the evaluation of blunt penile trauma remains con-

troversial [4]. Many authors agree that the diagnosis of penile fracture can rely exclusively on patient history and clinical findings [4,5]. The mainstay in the management of penile fracture is immediate surgical intervention. Most current studies favor immediate surgical repair because it is associated with adequate functional and cosmetic results, with minimal complications [1,4,6]. However, controversy still exists and some authors recommend delayed repair [3,7,8], allowing for resolution of edema and organization of hematomas, which makes identification and repair of the tunical tear easier. Historically, treatment was mainly conservative, consisting of cold compresses and anti-inflammatory drugs [9]. However, the long-term results of nonsurgical treatment may show several potential complications, such as penile curvature, pain during erection, fibrotic penile lesions, arteriovenous fistula, infection, and erectile dysfunction [10]. The purpose of this study was to analyze the experience at our center through a retrospective study of a number of cases diagnosed and treated for penile fractures.

## MATERIALS AND METHODS

In the period between January 2004 and February 2012, 42 patients with penile blunt trauma on an erect penis were admitted to our unit. The mean age of the patients was 33.8 years (range, 21 to 61 years). The data were collected in our database and then assessed retrospectively.

The initial approach was determined through physical examination and medical history. We analyzed the following variables: age, etiology, symptoms and signs, diagnostic tests, treatment used, complications, and erectile function during the follow-up. In addition, elapsed time from trauma to presentation, size and location of penile hematomas, penile deviation, presence of urethral bleeding, and location and size of ruptures were recorded. All patient data were retrospectively reviewed and patients were contacted by phone and re-evaluated whenever possible.

After the patient history and physical examination, ultrasound was applied for confirmation of diagnosis and measurement of lesions. In patients with gross hematuria with or without urethral bleeding, retrograde urethrography was performed to confirm urethral injury. In surgically treated patients, wide-spectrum antibiotics were administered prophylactically. The hematoma was evacuated and the defect in the tunica albuginea was repaired with absorbable sutures. Urethral Foley catheters were placed in all patients intraoperatively, and elastic dressings with soft pressure were applied to all patients postoperatively. For conservative treatment, bed rest, elastic dressings, penoscrotal elevation, and prophylactic antibiotics were used.

The statistical analysis of the data was done by using the Excel program (Microsoft Inc., Redmond, WA, USA). Comparison between groups was carried out by using chi-square tests with a *p*-value < 0.05 considered statistically significant.

**TABLE 1.** Clinical features and causes of penile fracture in our series (n=42)

Clinical feature and cause	Value
Symptoms and signs	
Pain	37 (88.0)
Cracking sound	26 (62.0)
Detumescence	34 (81.0)
Urethral bleeding	7 (17.0)
Hematoma	42 (100)
Penile deviation	35 (83.0)
Etiology	
Coitus	34 (80.9)
Manual manipulation	4 (9.5)
Rolling over in bed	4 (9.5)

Values are presented as number (%).

## RESULTS

The most common cause of penile fracture in our patients was trauma during sexual relationship (80.9%). The mean age of the patients was 33.8±9.2 years (range, 21 to 61 years). The mean elapsed time from trauma to surgery was 21.8±12.9 hours (range, 6 to 50 hours). The etiology and clinical findings of the patients are summarized in Table 1. All patients presented with penile swelling and ecchymosis, and 26 patients (62%) reported hearing a “snap” sound. The characteristic clinical presentation was diagnostic in all of the patients, and we confirmed the diagnosis by penile ultrasonography in 41 patients.

In 35 of the 42 patients, surgical repair was performed under spinal anesthesia. Six patients were submitted to conservative management because they did not agree to surgical treatment. In the surgical group, penile fracture was confirmed in 32 cases. In 3 cases, exploration revealed intact tunica with bleeding from the torn superficial vein that was ligated (false penile fracture). In all surgically treated patients, a subcoronal circular incision was used. The intraoperative findings in the surgically treated patients are listed in Table 2.

In seven patients with urethral bleeding, retrograde urethrography was performed to determine whether there was adjacent injury of the urethra and corpus spongiosum. Five patients were submitted to surgical treatment; one underwent conservative management and had a small partial lesion. In one other patient, not enough data were available. Two patients had incomplete urethral injury and urethrorrhagia, and three patients presented with complete urethral injury. Bilateral injury of the corpus cavernosum was present in all patients with complete urethral lesion. Among the patients with urethral lesions, none developed urethral stricture during the follow-up.

Mean length of hospitalization was 1.6 days (range, 1 to 5 days). In this group, one patient presented with infection and dehiscence of the sutures and another patient presented with urethrocutaneous fistula. The last case did not present with urethral bleeding preoperatively. Intraoper-

ative diagnosis of urethral injury was performed. The urethrocuteaneous fistula was resolved spontaneously after urethral catheterization.

Conservative treatment was administered to six patients. Late complications, such as penile deviation, pain on erection, and erectile dysfunction in the surgically treated group, were evaluated. Follow-up and results are summarized in Table 3. One patient who underwent conservative treatment presented with a lesion of the corpus spongiosum that was confirmed with ultrasound and a partial lesion of the urethra in urethrography. The patient was submitted to urethral catheterization for 8 weeks with resolution. Another patient who underwent conservative treatment developed severe erectile dysfunction and penile deviation and was treated with a penile prosthesis implant. Patients who underwent surgery more than 24 hours from penile fracture (n= 12) presented with late complications such as penile deviation, palpable plaque, erectile dysfunction, or pain on erection in three cases (25%). In the group who underwent surgery in less than 24 hours (n=23), six patients (26.1%) had late complications during

the follow-up. Comparison between groups was carried out by using the chi-square test. There was no statistically significant difference between the groups regarding late complications (p=0.45).

## DISCUSSION

Recent series have demonstrated that the diagnosis of penile fracture is mainly based on physical exam and history [5]. Nevertheless, magnetic resonance imaging can be carried out in equivocal cases. Furthermore, ureterography, ultrasonography, color Doppler duplex scan, and angiography can be performed.

Ultrasound plays an important role in determining the site of the injury and is a fast and safe tool. It is important to keep in mind that absence of loss of the continuity solution does not rule out penile fracture, because small fractures occluded by a thrombus can be missed. In our cases, ultrasound was the main diagnostic tool used.

There have been few reports in the literature regarding false penile fracture. The differential diagnosis from true penile fracture is difficult. False penile fracture may be due to rupture of the penile superficial or deep dorsal veins, dorsal artery, and dartos bleeding [11,12]. In our series, one presumed case of penile fracture submitted to surgery presented with an exclusive lesion of the dorsal vein, which was ligated.

Another adjacent or mimicking injury may include urethral lesion. Urethral injury could be an associated lesion in 10% to 33% of penile fractures [13]. Urethral injury usually occurs in association with a bilateral corpus cavernosal tear [14,15]. Gross hematuria, blood at the external meatus, and voiding symptoms suggest a urethral injury and some authors advocate urethrography. Note, however, that the absence of these features does not exclude the possibility of a urethral injury and a false-negative result can occur. Mydlo [16] showed that the sensitivity of urethrography is 50% in diagnosing concomitant urethral rupture in patients with penile fracture. Currently, flexible cystoscopy in the operating room before the placement of the Foley catheter has been advocated if there is a high suspicion of urethral injury [17]. In our series, three of seven patients with urethral injury presented with bilateral penile

**TABLE 2.** Intraoperative findings in surgically treated patients (n=35)

Intraoperative feature	Value
Site of the lesion (n=30)	
Right	19 (54.2)
Left	8 (22.8)
Bilateral	3 (8.5)
Absence of lesion (false penile fracture)	3 (8.5)
NR	2 (5.7)
Localization of the lesion (n=27)	
Proximal	19 (59.3)
Mid	8 (25.0)
Distal	0 (0)
NR	5 (15.6)
Associated injuries	
Urethra	5 (14.2)
Corpus spongiosum	3 (8.5)
Dorsal vein	3 (8.5)

Values are presented as number (%).  
NR, not reported.

**TABLE 3.** Patient follow-up and results

Follow-up and result	Surgical group (n=35)	Conservative group (n=6)
Perioperative complications	2	-
Late complications		
Erectile dysfunction	4	2
Penile deviation on erection	4	3
Pain on erection	4	1
Palpable plaque	3	3
Hospital stay (d), median (range)	1.6 (1-5)	NR
Follow-up, mean±SD (range)	14.5±21.5 (7 d-72 mo)	23.8±8.2 (4-46 mo)

NR, not reported; SD, standard deviation.

fracture.

Penile fracture treatment has trended toward an urgent surgical approach. Early surgery has been considered superior to conservative management [18]. Conservative measures may include cold compresses, antiandrogens to inhibit erections, anti-inflammatory drugs, pressure dressing fibrinolytics, antibiotics, and sedatives [4,18].

Such treatment is correlated with an increased incidence of complications such as erectile dysfunction in up to 50% of patients, curvature, hematoma infection, and palpable plaque [10].

Bennani et al. [19] demonstrated complication rates of 40.7% and 8.2% for conservative treatment and surgery, respectively. No definitive consensus has been reached on the timing of the surgical repair. Some current reports claim that there is no effect on long-term results when delayed surgery is performed. In this sense, some authors propose delayed repair for penile fracture [7,8]. It is assumed that the penile edema and hematoma at the acute stage requires a degloving approach for adequate exploration. This incision and extensive dissection may lead to greater injury to the blood vessels and nerves, requiring longer operative times, which in turn can lead to an increased incidence of skin necrosis and wound infection [20].

The option of the surgical approach to penile fracture is probably at the surgeon's discretion. A degloving incision provides exposure of the three corpora [21]. Moreover, a direct longitudinal incision over the presumed site of fracture is less traumatic, even if it may produce a worse cosmetic result [22]. An inguinoscrotal incision has been recommended for proximal fracture and for those situations in which penile edema is marked enough to harm skin viability to reduce lymphedema and subsequently wound infection and penile angulation [23].

We favored a subcoronal circumferential incision. Besides providing excellent exposure of the three corpora, this incision avoids missing multiple lesions of the tunica and urethral injury. Our results are similar to those reported in the literature and show the prevalence of immediate surgery compared with conservative treatment [15,18,24,25].

The reported complication rates for conservative and surgical treatment were 83.3% and 25.7%, respectively. A recent study revealed late complications in 12% of patients in a large series of immediately surgically treated penile fractures [25,26]. In the major reported series of surgical management, however, long-term complications were present in 4.7% [6].

Besides the retrospective analysis, the discrepancy in number between the surgical and conservative groups is a limitation of our study. However, the literature favors surgical management.

The majority of our patients maintained erectile function after the operation, with low morbidity and no serious deformities. Although we did not attempt to define the ideal interval between trauma and surgery to get optimal results, the evidence is sufficient to show that surgical treatment offers good outcomes.

## CONCLUSIONS

Penile fracture can be clinically diagnosed; however, associated injuries and radiological investigation remain controversial. Current reports favor early surgical management owing to the low incidence of early and late complications and a shorter hospital stay.

## CONFLICTS OF INTEREST

The authors have nothing to disclose.

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