

# Evaluation of epidemiology, concomitant urethral disruption and seasonal variation of penile fracture: A report of 86 cases

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## Abstract

**Introduction:** Penile fracture (PF) is a well-recognized clinical entity and is often deemed a urological emergency. It is not uncommon in our region. The main objective of this study is to describe the clinical characteristics of patients diagnosed with penile fracture in the Qom Province, Iran. We evaluate surgical treatment, concomitant urethral disruption and its seasonal variation.

**Methods:** This is a descriptive retrospective study, reviewing all the medical records of patients admitted with penile fracture from 2003 to 2012 at Kamkar Hospital of Qom, Iran. It takes into account variables related to the urological history, etiology, diagnosis and its surgical treatment. The epidemiologic data, marriage status and the seasonal variation were evaluated. In total, 86 patients, aged between 17 and 62, with PF were hospitalized in our centre. The average age of patients was 36.74 years. All operated cases were followed 3 months and 6 months after surgery.

**Results:** Of the 86 patients, 34 (68%) were the ages of 20 and 40. In terms of marital status, 56 (65%) were married and 30 (35%) were single at the time of presentation. Twenty-six patients (30.2%) had episodes related to intercourse and 48 patients (56%) to manual habitual trauma; the remaining 12 patients had a direct blow to an erect penis or rolled/fell off a bed. Patients presented with swelling, pain and a popping or cracking sound in the penis. The diagnosis was made using history and physical examination in all patients. Unilateral corporeal ruptures were present in 80 (93%) and bilateral in 2 cases (2.32%). Surgical repair was performed with a circumferential sub-coronal degloving incision in 82 cases (95.35%). There were seasonal variations: 22 cases in spring; 25 in summer; 17 in autumn; 22 in winter. Patients had an average postoperative hospital stay of 1 day.

**Conclusion:** Habitual manual trauma was the most common cause of PF in our study. Immediate surgical intervention has low morbidity, short hospital stay and rapid functional recovery. In the case of urethrorrhagia, concomitant urethral injury should be evaluated. On the basis of our study, PF may have seasonal variation.

## Introduction

Penile fracture (PF) is a rupture of the tunica albuginea of the penile corpora cavernosum occurring during penile erection. It occurs often in Iran.<sup>1</sup> The first reported case of PF was made by Abul Kasem, an Arab physician, in Cordoba (today part of Gibraltar (UK), Morocco, Portugal and Spain), more than 1000 years ago.<sup>2</sup> The incidence of PF is greater in Middle Eastern and North African countries (almost 55% of the total number reported) than in the United States or Europe (almost 30% of those reported).<sup>3,4</sup>

The etiology of this injury is divided to sexual and non-sexual causes. It usually occurs after an abrupt blunt trauma by forceful bending of the erect penis. Other reported causes include vigorous intercourse, masturbation<sup>3,4,5</sup> as sexual causes, and falling off a bed, placing an erect penis in the underwear<sup>3-6</sup> and spontaneously fracturing the penis while urinating as non-sexual causes.<sup>3</sup>

Injury can involve one or both of the corporal bodies and associated simultaneous urethral injuries may also occur. PF can be diagnosed with a history and a physical examination.

We retrospectively reviewed the epidemiology, incidence of concomitant urethral disruption, presenting symptoms and surgical treatment of PF in eligible patients treated at our institution. We also reviewed its seasonal variation (a first in the literature).

## Methods

This study was done in the Kamkar Hospital of Qom, Iran, from March 2003 to September 2012. In total, 86 consecutive patients with PF were included in our study. All patients were evaluated by history and clinical examination, duration since injury, site of fracture, extent of penile hematoma and blood at external meatus. All patients complained of hearing a cracking sound followed by rapid detumescence, pain and penile swelling.

Two cases of complete urethral disruption were detected. Therefore, retrograde urethrography was performed to detect urethral ruptures. At surgery time, in both cases, urethral disruption was seen and end-to-end urethral anastomosis with 3-0 vicryl suture was performed with synchronous repair of bilateral corpus cavernosum defects.

In all 86 cases, surgical repair was performed under spinal or general anesthesia. After anesthesia, Foley catheter (14F-18F) was fixed for every patient. Degloving circumferential incision of the penile skin and dartos fascia were performed. The procedure included: evacuation of the hematoma, identification of the site and number of defect, closure of the defect by 4/0 Prolene non-absorbable or 4-0 vicryl absorbable sutures in continuous manner, closure of Bucks fascia in longitudinal direction by running 4/0 chromic sutures, closure of the skin by running 4/0 chromic suture and finally dressing.

Urethral catheter was removed on postoperative day 1, and the patients were discharged. Patients were instructed to withhold intercourse and masturbation for 4 weeks, and to return after 3 and 6 months to evaluate the erectile state, presence of penile nodule and curvature during erection.

Statistical analysis was performed with the statistical software, SPSS version 16, using the chi-square test.

## Results

The median of age range was 20 to 35 years (mean: 36.74, range: 17-62). Thirty-four patients (68%) were between 20 and 40 years. Fifty-six patients (65%) were married and 30 (35%) were single at the time of presentation. The median hospital stay was 24 hours (range: 1-7 days).

The seasonal variation of the admitted cases was as follows: 22 cases (25.5%) in spring, 25 (29%) in summer, 17 (20%) in autumn, and 22 cases (25.5%) in winter. The lowest incidence occurred in autumn and was statistically significant ( $p < 0.001$ ) (Table 1).

Causes of fractures were manipulation in 48 cases (56%), sexual intercourse in 26 (30.2%), direct blow on erect penis in 7 (8%) and rolling or falling off a bed in 5 (5.8%). Injury involved unilateral corpora cavernosa in 80 cases (93%), bilateral corpora cavernosa with synchronous urethral rupture in 2 cases (2.32%) and subcutaneous mild hematoma in 4 cases (4.65%). The time from injury to presentation was 3 to 72 hours. All patients presented with the typical clinical

picture of a characteristic sound at the time of injury, pain, detumescence and moderate to severe hematoma. Physical examination revealed penile swelling, ecchymosis and significant tenderness on palpation of the penile shaft. Penile deviation was evident in 82 cases (95.35%). The site of rupture could be localized by the characteristic rolling sign in 72 cases (83.72%). Urinalysis was requested in all cases. Two patients complained of profuse urethral bleeding. Retrograde urethrography (RUG) was performed in the first case and RUG with urethroscopy in the second case of urethrorrhagia.

In all diagnosed PF patients, the tunical and urethral injuries were promptly repaired on the day of presentation or within the next 48 hours. The two urethral rupture cases were hospitalized for 1 week and the Foley catheter fixed for 2 weeks. Both of them had proper voiding function and sexual activity in long-term follow-up. All patients did very well after surgery and two cases (2.32%) had mild curvature, which had not hindered intercourse at follow-up (mean time of 6 months). Radiological investigations did not affect patient management in any of the cases. On surgical exploration, 82 operated patients (95.35%) had cavernosal tears and two also had simultaneous urethral injuries; all injuries were repaired successfully. The length of the tear ranged from 1 to 3 cm.

Four patients (4.65%) did not have typical clinical signs and symptoms of PF and were diagnosed as having a superficial dorsal vein rupture (Table 2). The defect was in the mid-shaft or proximal shaft in 82 cases (95.35%): 48 cases (55.8%) right side and 32 cases (37.2%) left side, and 2 cases (2.32%) bilaterally. The defect was located laterally or ventrolaterally in all cavernosal injured cases.

All patients were able to achieve full erection with a straight penis, except in 2 cases (2.32%), in whom mild curvature and pain during erection were observed. Both of them had acceptable sexual activity in long-term follow-up. Significant nodules at the place of defect were seen in 8 cases (9.3%). However, no tunical tear was found clinically in 4 (4.65%) cases.

No early complications occurred in any case. Patients available for a median follow-up of 6 months reported adequate erection for intercourse without voiding dysfunction.

**Table 2. Lesions found at the time of surgical repair in our admitted penile fracture cases**

Type of lesion and its laterality	Cases (%)
<i>Corpus cavernosum only</i>	80 (93)
Right-side lesion	48 (55.8)
Left-side lesion	32 (37.2)
Dorsal vein only	4 (4.64)
Concomitant urethral rupture + bilateral corpus cavernosum	2 (2.32)
Total	86 (100)

**Table 1. The seasonal variation of penile fracture**

Season	No. cases (%)	p value
Spring	22 (25.5%)	>0.001
Summer	25 (29%)	>0.001
Autumn	17 (20%)	<0.001
Winter	22 (25.5%)	>0.001

## Discussion

Injuries to the flaccid penis are uncommon due to its protected location and relative mobility.<sup>7</sup> However, in the tumescent state the corpora cavernosa becomes engorged with blood and the tunica albuginea thins from 2 mm to 0.25-0.5 mm.<sup>8</sup> The thinning of the tunica albuginea makes it more susceptible to traumatic injury. The normal pressure inside the erect penis is the mean arterial pressure, at 100 mmHg. The intra-corporal pressure that is needed to rupture the tunica or overcome its tensile strength is 1500 mmHg.<sup>9</sup>

The total reported cases of PF in Iran is estimated at 420, since its first report in 1996<sup>8</sup> to last in 2008.<sup>1</sup> Due to cultural issues or individual shame, it seems under-reported in our region.

The etiology of PF is "Taghaandan," "breaking the Qholenj" or forcefully bending the erect penis to achieve detumescence.<sup>3</sup> The most frequent mechanism of PF is the bending of an erect penis over the pubic bone or the perineum of the sexual partner during intercourse, bending during masturbation or after a sudden deliberate penile kneading and snapping to achieve detumescence.<sup>4</sup> In our series, habitual penile manipulation was the main cause of fracture (57.2%), concurrent with Zargooshi from Western Iran.<sup>10</sup> The cause of PF in Iran is mainly a direct blunt force or habitual clicking of the erect penis to achieve detumescence (Taghaandan) (or breaking of penile Qholenj). In Zargooshi's series, he found that direct blunt force was responsible in 76.4% of cases,<sup>1</sup> but in our series it was seen in 56% of cases. He attributed this high incidence to Western Iran's misinformation about penile tissues.<sup>1,10</sup> The high occurrence of PF in our society seems to be related to sexual intercourse in improper situations or inadequate knowledge about sexual practice, or high level of shame due to cultural issues (i.e., forceful hiding of an erect penis in underwear). Although the word Taghaandan is a Persian word, it is being used in recent medical literature.<sup>11</sup> In Western society, vaginal intercourse is the main cause of PF.<sup>3-6,12</sup>

PF remains a clinical diagnosis. In our experience all patients were diagnosed based on a physical examination and history. PF should be diagnosed based on clinical presentation. After a typical history and physical exam, patients rarely need radiographic studies.<sup>13,14</sup> Distinguishing false PF from true PF with certainty is hard either clinically or radiologically; therefore, surgical exploration is mostly necessary.<sup>15</sup> Patients present with swelling of the penile shaft or "eggplant deformity," discoloration and deviation of the penile shaft. If the hematoma is contained within Buck's fascia, the "rolling sign," a palpable clot felt directly over the tear in the tunica albuginea, can determine the site of the injury.<sup>3</sup> If Buck's fascia is disrupted, blood will extravasate

into the subcutaneous plane of the scrotum, perineum or pubic areas, resulting in significant swelling.

Concomitant urethral injuries have been reported in up to 3% of cases in the Persian Gulf countries and Japan, and 20% to 38% in the United States and Europe.<sup>16</sup> Urethral rupture usually occurs after bilateral cavernosal rupture<sup>17</sup> and the incidence can be up to 38%.<sup>16</sup> The incidence of concomitant urethral rupture is much lower, up to 3%, in Iran and Japan,<sup>10</sup> where the most frequent cause of PF is not sexual intercourse. In our series there were only 2 cases (2.32%) of complete urethral disruption where end-to-end urethral anastomoses were needed. The possibility of urethral injury is very low due to the location of the urethra in relation to the site of injury.<sup>5</sup>

The location of the PF is usually transverse and unilateral,<sup>18</sup> as confirmed in our study. There are many complications of PF depending on the time interval since fracture.<sup>19</sup>

Many reports suggested that immediate surgical repair offers better long-term results than conservative treatment.<sup>14-20</sup> The current standard of care for PF is immediate surgical repair, due to the decreased incidence of subsequent morbidity. Immediate surgical exploration and repair result in more than 90% of patients having normal sexual intercourse after surgery.<sup>12</sup> In a recent report, the success rate was 92% for immediate surgical repair and 59% for conservative management.<sup>20</sup> In a large series reported by Zargooshi, the long-term complication rate of immediate surgical repair was 4.7%.<sup>10</sup> Our data support immediate surgical repair and suggest that a circumferential incision is sufficient and advantageous in repairing PFs.

All repairs were performed with a urethral catheter in place because it greatly facilitates orientation, especially when there is a large hematoma.<sup>21</sup> Subcoronal degloving incision is the most efficient approach, as it allows not only excellent exposure of the ruptured corpus cavernosum, but also adequate assessment of contra-lateral corpus and urethra. In addition, it is the most cosmetic incision.<sup>15</sup>

Some authors report that the distal third of the penile shaft is most commonly involved.<sup>13</sup> In our study, 93% of cases were in the mid-shaft or proximal shaft, which is concurrent with Zargooshi.<sup>1</sup> Absorbable<sup>18</sup> and non-absorbable sutures<sup>10</sup> have been used to repair the tunical rupture.

To the best of our knowledge, we did not find any documented relation between PF incidence and its seasonal variation. We found that the incidence of PF is lowest in autumn ( $p < 0.001$ ), while there are no statistical differences in its incidence in the other three seasons ( $p > 0.001$ ).

## Conclusion

Non-sexual trauma (Taghaandan practice) was the most common cause of PF in our specific region of Iran. Standard

treatment included immediate surgical repair of the tunica albuginea in most patients. However, in the case of urethrorrhagia and supposed concomitant urethral rupture, simultaneous end-to-end urethroplasty with tunical repair should be performed.

We observed a seasonal variation of penile fracture. Its incidence was the lowest in the autumn season. However, we did not find any reasonable cause for it.

**Competing interests:** None declared.

This paper has been peer-reviewed.

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