

Management of penile fractures

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ABSTRACT

الأهداف: لاستعراض خبرتنا في المعالجة الجراحية والتحفظية لكسور القضيب (الذكر).

الطريقة: أجريت الدراسة في مركز المسالك البولية والكلية - مستشفى الثورة النموذجي والتعليمي - صنعاء - اليمن، خلال الفترة ما بين يونيو 2003م وحتى سبتمبر 2007م، لرصد حالات كسور القضيب (الذكر). شملت الدراسة 30 مريضاً، واعتمد التشخيص على الكشف السريري. ستة من المرضى كانوا يعانون من كسر بسيط وعولجوا معالجة تحفظية في حين أن 24 مريضاً كانوا يعانون من إصابة شديدة وخضعوا للعلاج الجراحي.

النتائج: تراوحت أعمار المرضى ما بين 24 - 52 عاماً (بمتوسط 31.3) عاماً، 46.7% من المرضى كانوا دون سن 30 سنة، و56.7% كانوا غير متزوجين. التلاعب الصلب بالقضيب سواء أثناء العادة السرية أو ثني القضيب بقوة كانت الآلية الأكثر لإحداث الكسر في 53.3% من المرضى. كان التمزق أحادي في 22 مريضاً، وثنائياً مصحوباً بتمزق الإحليل في مريضين، تم خياطة جميع التمزقات بخيوط جراحية اصطناعية قابلة للامتصاص، وأُصلحت التمزقات الإحليلية أولاً. جميع المرضى المعالجين جراحياً استعادوا المقدرة على الانتصاب الكامل فيما عدا ثلاثة من الثمانية الذين تم علاجهم بشق طولي، حيث لاحظوا تقوس طفيف في القضيب عند الانتصاب. المرضى الذين عولجوا تحفظياً عبروا بإيجابية عن حالة الرضا الجنسي ولم يشتكوا من أي تقوس أثناء الانتصاب.

خاتمة: النتائج المثلى وظيفياً وجمالياً يتم الحصول عليها عقب الجراحة الفورية لترميم حالات كسر القضيب (الذكر)، لكن هناك نتائج توصف بالجيدة بعد المعالجة التحفظية في بعض الحالات المنتقاة.

Objectives: To present our experience with surgical and conservative management of penile fracture.

Methods: This prospective study was carried out in the Urology and Nephrology Center, at Al-Thawra Modern General and Teaching Hospital, Sana'a, Yemen from June 2003 to September 2007, and

included 30 patients presenting with penile fracture. Diagnosis was made clinically in all our patients. Six patients with simple fracture were treated conservatively while 24 patients with more severe injuries were operated upon.

Results: Patients' ages ranged from 24-52 years (mean 31.3 years), 46.7% of patients were under the age of 30 years and 56.7% were unmarried. Hard manipulation of the erect penis for example during masturbation was the most frequent mechanism of fracture in 53.3% of patients. Solitary tear was found in 22 patients and bilateral corporal tears associated with urethral injury were found in 2 patients. Corporal tears were sutured with synthetic absorbable sutures and urethral injury was repaired primarily. All operated patients described full erection with straight penis except 3 of the 8 patients who were managed by direct longitudinal incision, in whom mild curvature during erection was observed. The conservatively treated patients described satisfactory penile straightness and erection.

Conclusion: The optimal functional and cosmetic results are achieved following immediate surgical repair of penis fracture. Good results can also be obtained in some selected patients with conservative management.

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Fracture of the penis is defined as a blunt traumatic rupture of the tunica albuginea of the corpora cavernosa in an erect penis. It may occasionally be complicated by rupture of corpus spongiosum and the urethra.¹⁻³ The patient's history and clinical findings alone are diagnostic for penile fracture. Characteristically, patients hear a sharp cracking sound that is followed by rapid detumescence, pain, swelling, ecchymosis, and deformation of the penis.^{4,5} This typical presentation obviates the need for further imaging studies, such as ultra-sonography, with its false-negative results and operator dependency or magnetic resonance imaging, which has been shown to be extremely accurate in diagnosing and localizing corporal injury, but this modality is limited by the time and the significant cost of the study.^{6,7} The presence or history of blood at the external urethral meatus, gross hematuria, and voiding difficulties are suspicious of a urethral injury and should be investigated further by retrograde (ascending) urethrography.^{6,8} The therapeutic approach for penis fracture is still a matter of some controversy among experts. Immediate surgery is advocated by many authors who reported excellent long-term results following such approach.^{9,10} In addition, prompt surgical management results in a significantly shorter hospital stay.³ Recent reports from large series of surgically treated cases, showed long-term complications in 4.7-12.2% of patients.^{9,11} This is in contrast to the permanent penile deformity, suboptimal coitus, impaired or painful erection, which were experienced by 10-30% of the patients following conservative treatment.¹² Although, series from the eighth decade of the last century reported such high complication rates with non-surgical treatment, good results were recently reported after conservative therapy in a small group of patients who refused to undergo surgery.¹³ The aim of this present prospective study was to determine the outcome of the accepted management strategies of penile fracture and to report our experience with this type of genitourinary trauma.

Methods. We carried out our study in the Urology and Nephrology Center, at Al-Thawra Modern General and Teaching Hospital, Sana'a, Yemen, the main referral hospital in the country, from June 2003 to September 2007. It included 30 patients with penile fracture, who were diagnosed and treated at our center during this period. The study was designed to include all patients with such diagnosis who were admitted and treated at our hospital throughout the period of the study; therefore, patients who might refuse admission were planned to be excluded from the study. None of the patients refused admission, hence, none were excluded. The Academic Committee, which is the official scientific body responsible for continuous medical education and

supervising clinical researches at Al-Thawra Modern General and Teaching Hospital declared that this study did not require an ethical approval by the committee. At presentation to the hospital, all patients were evaluated by careful history and thorough clinical examination to ascertain the diagnosis, time elapsed since injury, mechanism of trauma, extent of penile hematoma, blood at external meatus, and presence of urinary retention. The clinical symptoms did not vary greatly between subjects, who reported "a cracking sound" at the moment of injury followed by rapid detumescence, swelling, and deformation of the penis. However, pain was a variable symptom. Two patients presented with blood at the meatus and were unable to void, and the suspected urethral injury was confirmed by ascending urethrography. Findings at presentation included penile swelling, ecchymosis, penile deviation, and tenderness on palpation of penile shaft. Manual examination of the penis detected the site of the corporal tear by palpating the overlying hematoma in 12 patients. However, in the remainder of patients, blood extravasated along the fascial planes into the scrotum and pubic area due to tearing of Buck's fascia, and in such cases the site of tear was difficult to be detected precisely. The detailed presenting symptoms and signs and their percentage is illustrated in Table 1.

Our management strategies were based on the severity of the injury, so conservative treatment was adopted to patients with simple fracture (defined as small hematoma with minimal deformity), while immediate surgery was undertaken in patients with more severe injuries. Six patients had simple fracture, and were treated conservatively by cold compresses, anti-inflammatory agents, and empirical antibiotics. Twenty-four patients underwent urgent surgical intervention after prophylactic antibiotics. Degloving circumferential subcoronal incision was performed in 16 patients, while direct longitudinal incision was utilized in the remaining 8 patients in whom the

Table 1 - Clinical presentation of penile fractures.

Clinical presentation	No. of patients (%)
<i>Symptoms</i>	
Cracking sound & detumescence	30 (100)
Penile swelling	30 (100)
Pain*	28 (93.3)
Unable to void	2 (6.6)
<i>Signs</i>	
Penile swelling & deviation	30 (100)
Penile tenderness	30 (100)
Blood at meatus	2 (6.6)
Detection of corporal defect	12 (40)

*Pain was variable in severity

hematoma was more localized, the tear was readily detectable by palpation and there was no suspicion of bilateral tears. The surgical repair included evacuation of the hematoma, careful hemostasis, and closure of the corporal tears by interrupted synthetic absorbable sutures (namely 3/0 polyglycolic acid). The urethral tears, when presented, were repaired primarily by interrupted 4/0 polyglycolic acid sutures and a silicon transurethral catheter was inserted and left for 2 weeks. All operated cases were discharged between the third and the fourth postoperative day; they were instructed to continue antibiotics for one week, to withhold intercourse for 4 weeks, and to return after 2 months for evaluation, or earlier if they experienced unusual pain or if they developed infection. The 2 patients with associated urethral injury were seen after 2 weeks, where ascending urethrography confirmed the integrity of urethral repair.

Results. Thirty patients with penile fracture were managed in our center during the period of the study. Patients' ages ranged from 24-52 years (mean 31.3 years), 14 patients (46.7%) were under the age of 30 years and 17 (56.7%) were unmarried. The time elapsed from trauma to admission ranged from 2 hours to 2 weeks (mean 19 hours). Hard manipulation, namely either due to masturbation or forcibly bending the penis to achieve detumescence was the most common mechanism of fracture, followed by injury during vigorous vaginal intercourse. Least common causes were rolling onto an erect penis and fall from bed onto an erect penis during sleep (Table 2). The tear in the corpora cavernosa was solitary in 22 out of the 24 patients who were managed surgically (20 right sided and 2 left sided). In the remaining 2 patients, there were bilateral tears, and were accompanied by urethral injury. The length of the tear ranged from 1-3 cm (mean 2.1 cm). There were no significant intra-operative or postoperative complications.

All patients were followed and examined clinically at least once after discharge, the clinical follow-up stressed on erectile function, sexual intercourse, penile curvature and voiding. Overall mean follow up was 13

months (ranged from 3 months to 2 years), by either direct out-patient visit (17 patients) or by telephone (13 patients). We faced some difficulties at applying the International Index of Erectile Function (IIEF)¹⁴ or its 5-items version (IIEF-5)¹⁵ for evaluation of erectile function in the follow-up of our patients. The IIEF was found to be complex and difficult to interpret and to understand by many of our patients. Therefore, a simplified method - based on patients' self-report - was adopted to evaluate penile function (erection) in our patients. We categorized erectile function in our patients into good function (full and sustained erection during sexual act), moderate function (inability to maintain erection sufficient for satisfactory sexual performance) and poor function (inability to attain erection hard enough for penetration).¹⁶ For non-married subjects, we inquired about morning erection and erection during fantasy as compared to the pre-trauma status. All operated patients were able to achieve full erection with straight penis, except 3 of the 8 patients who were managed by direct longitudinal incision, in whom mild curvature during erection was observed, but that did not impede sexual intercourse. The 2 patients with urethral tears were evaluated 3 months following the repair by ascending urethrography, which showed no evidence of stricture at the site of repair. They did not complain of voiding difficulties or other urinary symptoms. The conservatively treated group of patients reported normal erectile and sexual function and had no complaints of curvature or voiding difficulties.

Discussion. Fracture of the penis is an increasingly reported genitourinary trauma. In the United States, traumatic coitus is claimed to be the cause of injury in 30-50% of cases; whereas cases reported from the Middle East resulted mainly from penile manipulation, including kneading to achieve detumescence.³ In Japan, only 19% of cases were attributed to sexual intercourse, while the majority of fractures were reported as the result of masturbation and rolling over in bed onto an erect penis.¹⁷ In our series, the most frequent mechanism of fracture was due to hard manipulation (53.3%). Our study showed that 46.7% of patients were under the age of 30 years and 56.7% were unmarried, and the fact that these patients were living in a conservative community would explain why penile fracture had occurred during hard manipulation in more than one half of our patients who resorted to masturbation as the easiest available option for sexual relief. Fracture of the penis occurs as an emergency and it usually self-evident from the typical history and the physical findings.^{5,7} In our study, diagnosis was made clinically in all patients and the suspected associated urethral tears were confirmed by retrograde urethrography. The controversy regarding the

Table 2 - Causes of penile fracture (N=30).

Mechanism of trauma	No. of patients (%)
Hard manipulation*	16 (53.3)
Vigorous vaginal intercourse	8 (26.6)
Rolling onto an erect penis	4 (13.3)
Fall from bed on an erect penis	2 (6.6)

*Masturbation: 12 (40%), forcibly bending penis: 4 (13.3%)

management options for such trauma was mentioned earlier in the introduction section of this article, with many reports recommending immediate surgery to achieve excellent long-term results,^{9,10} in contrast to the results of conservative treatment, which affected the straightness of the penis and erectile function in a significant percentage of patients.^{3,18} However, there are few reports comparing conservative and surgical treatment of penile fracture.¹⁹

Spontaneous healing without complications is probable for tears in the tunica albuginea without extensive hematoma or concomitant urethral injury. However, spontaneous resorption of extensive hematoma can take several weeks; hence, patients with such hematomas will benefit from early intervention in terms of more rapid healing.¹⁹ Conservative treatment has been recommended when the cavernosal bodies are intact, but it may be difficult to exclude cavernosal rupture completely, even with expensive and time consuming radiological procedures.⁵ In our series, all conservatively treated patients described normal sexual life and they had no complaints of curvature or voiding difficulties. It is possible that patients in our conservative group had less severe injuries than patients who underwent immediate surgery, this would consequently bias the results in favor of conservative therapy.

The choice of access for repair of a penile fracture is probably a matter of custom or preference.²⁰ Distal circumferential incision followed by degloving of the skin down to the penis base, is favored by most authors, because it allows both excellent visualization of the fracture site and adequate assessment of the contralateral corpus cavernosum and corpus spongiosum.²⁰⁻²² Some authors believe that it is unnecessary to deglove the entire penis to locate a small proximal unilateral tear with high probability of increased incidence of hematoma, decreased penile sensation, sepsis or skin necrosis.^{6,23} Alternatively, a direct longitudinal incision over the presumed site of fracture is simple and less traumatic, but may be associated with poor cosmetics as well as penile angulation.¹ Three of eight of our patients whose tears were accessed via direct longitudinal incision observed mild curvature during erection, this was not observed in any of the 16 patients explored by circumferential incision. The later group of patients reported excellent functional and cosmetic results. Urinary extravasation resulting from concomitant urethral tears can cause fibrous tissue formation within the corpora cavernosa and subsequent penile deformity; therefore, immediate surgery is advocated in patients with urethral injury.^{22,24} The frequency of such injuries ranged from 0-3% in the Persian Gulf and Japan, to 20-38% in the United States and Europe.^{6,9,25} In the present study, there were only 2 cases of urethral injuries (6.6%). It is interesting

to notice that the frequencies of associated urethral injuries in our series and in series from the Persian Gulf and Japan were relatively lower than in those reports from the United States and Europe. Considering that hard manipulation, for example masturbation, was the most common cause for fracture penis in eastern studies as opposed to western ones where the trauma happened mostly during coitus; consequently, the mechanism and the magnitude of trauma could contribute to this discrepancy. Therefore, it could be postulated that such a mechanism of trauma in eastern series might result in paradoxically lower incidence of associated urethral tears. This issue needs more discussion and clarification in further future studies. We pointed to the difficulties when applying the IIEF or other diagnostic tools for evaluation of erectile function postoperatively and in the conservatively treated patients. The IIEF is only recommended for use in clinical trials or research projects in which assessing erectile function is the primary goal; it is not suited for use as a simple office screening measure.¹⁴ Instead, we utilized a simplified inquiry which relied upon patients' self-report of erectile function¹⁶ as compared to the pre-trauma status. This issue might be a source of potential limitation of our study.

In conclusion, fracture of the penis is an increasingly reported genitourinary trauma. Hard manipulation of the erect penis for example during masturbation was the main contributory cause in the majority of cases followed by fracture during intercourse. In order to achieve the optimal anticipated functional and cosmetic results, immediate surgical repair was undertaken once the diagnosis had been made. Such optimal results were best obtained when circumferential degloving incisions were utilized for exploration of the corporal tears. Conservative management when applied to selected patients with simple fracture yielded good results.

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