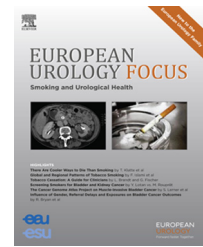


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Platinum Priority – Andrology

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Delaying Surgical Treatment of Penile Fracture Results in Poor Functional Outcomes: Results from a Large Retrospective Multicenter European Study

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Article info

Article history:

Accepted February 22, 2016

Associate Editor:

James Catto

Keywords:

Penile fracture
Erectile dysfunction
Surgical repair
Delay

Abstract

Background: Penile fracture is a rare clinical entity that represents a urologic emergency. It involves traumatic rupture of the tunica albuginea of the corpora cavernosa due to twisting or bending of the penile shaft during erection.

Objective: To determine the differences in preoperative diagnostic evaluation patterns and outcomes of penile fracture patients to investigate the impact of surgical delay on functional outcomes.

Design, setting, and participants: A retrospective analysis was performed using data obtained from 137 patients presenting with penile fracture at seven different European academic medical centers between 1996 and 2013. Age, imaging modalities used, timing of surgical intervention, length of tunica albuginea defect, and surgical technique were recorded. Postoperative erectile function outcomes were assessed with the International Index of Erectile Function (IIEF-5), and the presence of postoperative penile curvature was noted.

Outcome measurements and statistical analysis: The association between timing of surgical intervention and postoperative IIEF-5 results was evaluated with discriminant function analysis.

Results and limitations: The median age of the patients was 34.50 yr (interquartile range [IQR]: 28.0–46.5 yr). Of the 137 patients, 82 (59.85%) underwent penile Doppler ultrasound, and 5 patients (3.64%) were evaluated with magnetic resonance imaging. All patients were treated surgically, and the duration between emergency room admission and surgical intervention was 5.0 h (IQR: 3.6–8.0 h). The median length of tunica albuginea defect was 10 mm (IQR: 8–20 mm). Postoperative IIEF-5 scores were

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<http://dx.doi.org/10.1016/j.euf.2016.02.012>

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Please cite this article in press as: Bozzini G, et al. Delaying Surgical Treatment of Penile Fracture Results in Poor Functional Outcomes: Results from a Large Retrospective Multicenter European Study. *Eur Urol Focus* (2016), <http://dx.doi.org/10.1016/j.euf.2016.02.012>

21 (IQR: 12–23) and 23 (IQR: 15–24) at the first and third postoperative months, respectively. Discriminant function analysis revealed that if the surgical intervention was performed >8.23 hours after emergency room admission, postoperative erectile function was significantly worse ($p = 0.0051$ at first month and $p = 0.0057$ at third month postoperatively).

Conclusions: Our multicenter study showed that delaying surgical intervention results in significantly impaired erectile function. Surgical treatment must be planned as soon as possible to avoid postoperative erectile dysfunction.

Patient summary: We looked at sexual outcomes following the repair of penile fracture in a large European population. We found that outcomes worsened if surgical repair was delayed.

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1. Introduction

Penile fracture is defined as a traumatic rupture of the tunica albuginea of the corpora cavernosa due to twisting or bending of the penile shaft during erection [1]. Rupture may extend to the corpus spongiosum and the urethra [2]. Incidence of penile fracture varies considerably within different geographic areas. In western European countries, the injury typically occurs during sexual intercourse, and it appears that this condition is more likely to occur in stressful situations [3–7]. In the Middle East, the Gulf area, and North Africa, the most frequent cause is reported to be forceful manipulation (65%) [8].

The first penile rupture case was reported in 1957 by Fernstrom [9], who recommended surgical intervention following a long period of observation and conservative management. Today, immediate surgical repair is widely accepted as the treatment of choice because of the excellent long-term results [3,10–14].

Diagnosis of penile fracture is based mainly on clinical presentation. Patients typically hear a cracking or snapping sound, followed by rapid detumescence, sharp penile pain, and swelling with or without ecchymosis of the penile shaft [15–19]. Currently, there are no evidence-based recommendations regarding the algorithm to apply for patients with penile fracture; however, many physicians require imaging studies despite the limited clinical relevance of preoperative ultrasound or magnetic resonance imaging (MRI) to confirm the diagnosis and/or to evaluate the extent of the trauma [12,20].

Early surgical exploration and closure of the tunica is recommended to avoid long-term complications [9,13, 21–23]; however, reports on postoperative erectile function outcomes are rare, and it is not known whether time from diagnosis to surgery influences these long-term outcomes [24,25].

The aim of this study was to determine the differences in preoperative diagnostic evaluation patterns among various high-volume medical centers and to assess the outcomes of penile fracture patients to analyze the impact of surgical delay on functional outcomes.

2. Patients and methods

A retrospective analysis was performed using data obtained from 137 patients presenting with penile fracture at seven different European

academic medical centers between January 1996 and January 2013. Patients with an unclear history or nontypical clinical presentation were excluded from the study. Exclusion criteria were the absence of a traumatic event related to subsequent access to the emergency room (ER), the absence of a penile hematoma, and the absence of a fracture of the corpora cavernosa at the surgical approach. Patients without variables to be considered in our analysis were excluded.

After a complete anesthesiologic evaluation, full blood test, electrocardiogram, and chest x-ray, if requested, the patients underwent surgical exploration. Written consent was obtained from the patients.

A circumferential subcoronal incision with degloving of the penis was used to locate the exact site of the tear. Evacuation of the hematoma was performed before the surgical repair. Defect closure of the corpus cavernosum was performed using absorbable PDS 2/0 suture with inverted knots. In the presence of concomitant rupture of the corpus spongiosum with urethral damage, the defect was closed with Monocryl 4/0 suture. In these cases, a catheter was left for at least 14 d. After complete repair, an induced erection with saline was carried out to confirm the correct closure of the repaired fascia.

Moreover, postoperative erectile function outcomes were assessed with the International Index of Erectile Function (IIEF-5) at the first and third months after surgery. Erectile dysfunction was defined as an IIEF-5 score <12 [26]. IIEF-5 was collected during a visit for the first month after the surgical approach, and a phone call was made for the second assessment.

Patients who had their surgery before 1999 were asked to complete an IIEF-5 regarding their outcome at 1 and 3 mo after surgery.

Univariate and multivariate logistic regression models were used to test the probability of suffering from erectile dysfunction as a function of the following variables: patient age, cause of fracture, clinical examination findings, extension of injury, presence of urethral injury, and time elapsed from hospital admission until the surgical intervention. A Wald chi-square test was used to assess p value. For the variables that showed $p < 0.05$, a discriminant function analysis was carried out to generate a cut-off value.

3. Results

The median age of the patients was 34.5 yr (interquartile range [IQR]: 28.0–46.5). The majority of patients had fracture during sexual intercourse and presented with an eggplant deformity, whereas a few had limited penile hematoma or normal clinical appearance (Table 1). A total of 137 patients met the inclusion criteria (27 in Milan, Italy; 24 in Madrid, Spain; 22 in Barcelona, Spain; 14 in Vienna, Austria; 7 in Naples, Italy; 23 in Leuven, Belgium; 20 in Zurich, Switzerland). Overall, 31 patients were excluded because they did not meet the inclusion criteria.

Of the 137 patients who were included, 82 (59.85%) underwent penile Doppler ultrasound and 5 (3.64%) were

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