

SEXUAL MEDICINE REVIEWS

Current Management of Penile Fracture: An Up-to-Date Systematic Review

Marco Falcone, MD,¹ Giulio Garaffa, MD, PhD,² Fabio Castiglione, MD,² and David J. Ralph, MD²

ABSTRACT

Introduction: Because of the low incidence of penile fracture, many aspects of the diagnostic process and of the surgical and functional outcomes are rarely reported.

Aim: To systematically review the current literature on the surgical management of penile fracture, focusing on etiology, diagnosis, functional outcomes, and postoperative complications.

Methods: The present review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) declaration standards for systematic reviews. A systematic search for the terms *penile fracture*, *fracture of penis*, *trauma of penis*, *rupture of corpora cavernosa*, and *immediate management of penile fracture* was carried out in the PubMed, EMBASE, Cochrane, SCOPUS, and Science Citation Index databases.

Main Outcome Measures: Etiology of penile fracture, clinical presentation, types of radiologic investigations and their accuracy, surgical approach, suture material used for tunica repair, timing of surgical exploration, intraoperative findings, surgical complications, and functional outcomes.

Results: The total number of patients analyzed was 438, and the patients' average age was 36 years. The most frequent reported cause of penile fracture was sexual intercourse (80% of cases). The most common finding at examination was a penile hematoma (97.5%). Although operator dependent, in experienced hands, ultrasonography was found to be a useful tool in confirming the location of the albuginea tear and identifying the presence of any concomitant urethral injury, helping the surgeon to choose the best surgical approach. Early surgical repair of a penile fracture was found to be a safe procedure, although long-term complications are not uncommon. Tertiary referral centers that managed a larger number of cases seemed to obtain more satisfactory long-term results with a significantly smaller number of complications.

Conclusion: A low incidence of postoperative complications and full satisfactory functional outcomes are reported when early repair is performed in high-volume centers. **Falcone M, Garaffa G, Castiglione F, Ralph DJ. Current Management of Penile Fracture: An Up-to-Date Systematic Review. Sex Med Rev 2017;X:XXX–XXX.**

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Key Words: Penile Fracture; Penile Trauma; Erectile Dysfunction; Penile Curvature; Penile Hematoma

INTRODUCTION

Penile fracture, defined as rupture of the tunica albuginea of the corpora cavernosa, can occur in isolation or in association with a urethral tear.^{1–5} Although the overall incidence of penile fracture is relatively low, there are significant variations in the geographic distribution of cases. Although penile fracture is considered a rare event in Western countries, this condition is

much more common in the Middle East, possibly because of a different etiology of the fracture in these two different geographic areas.^{5–24}

In Western countries, penile fracture usually occurs when the erect penis hits the female pelvis during sex. In the Middle East, the “Taghaandan” maneuver seems to be responsible for the vast majority of cases.

Although the diagnosis of penile fracture is mainly clinical, with the patient reporting a “popping” sound followed by pain, rapid detumescence, swelling, and bruising, imaging can play a role in confirming the diagnosis, identifying the exact location of the tunica tear, and ruling out the presence of urethral involvement.^{17,25–35}

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¹Urology Department, Città della Salute e della Scienza, Torino, Italy;

²The Institute of Urology, University College London Hospitals, London, UK
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It is widely accepted that the gold standard management of penile fracture is immediate surgical exploration and repair of the tunica tear and, eventually, of the associated urethral injury to minimize fibrosis deposition in the cavernosal spaces and, in consequence, to lessen the risk of long-term erectile dysfunction.^{6,7,16,25,36,37}

Owing to the relatively low incidence of penile fracture, many aspects of the diagnostic process and of the surgical and functional outcomes are described in case series because the number of systematic reviews on this topic is very limited.^{5,7,28,38}

METHODS

Objectives

The aim of this report is to systematically review the current literature on the surgical management of penile fracture, focusing on etiology, diagnosis, functional outcomes, and postoperative complications.

Study Characteristics and Acquisition of Evidence

The present review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) declaration standards for systematic reviews.³⁹ A systematic search for the terms *penile fracture*, *fracture of penis*, *trauma of penis*, *rupture of corpora cavernosa*, and *immediate management of penile fracture* was carried out in the PubMed, EMBASE, Cochrane, SCOPUS, and Science Citation Index databases. The search was limited to the past 5 years (2012–2017) to focus on the most up-to-date information. All series written in English, retrospective or prospective, comparative or non-comparative, with more than five patients were included in the selection process. The selection process is presented in [Figure 1](#).

Outcome Measures

The outcome measures selected for the analysis were patient characteristics, etiology of penile fracture, clinical presentation, types of radiologic investigations and their accuracy, surgical approach, suture material used for tunica repair, timing of surgical exploration, intraoperative findings, surgical complications, and functional outcomes. The outcome measures are presented in [Tables 1–4](#).

RESULTS

The initial search identified 1,126 potentially relevant studies, of which 1,077 were excluded at abstract screening because of duplication or irrelevance. Another 34 did not meet the inclusion criteria or had insufficient data parameters or fewer than five patients. The remaining 14 studies^{9–13,29,31,36,40–44} were deemed relevant and were included for the ultimate review process as presented in [Figure 1](#).

Patients' Features

Overall, 14 studies from four different continents were selected, although most were from European centers ([Table 1](#)). The total number of patients analyzed was 438, and the patients' average age was 36 years. The age distribution differed significantly among the different geographic areas; patients in Western countries were considerably older than those in Asia and Africa (Africa 26.4 years; Asia 33.7 years; Europe 38.7 years; North America 37.6 years). This difference in distribution was probably secondary to the different etiologies of trauma in the different geographic regions.

Etiology of Penile Fracture

Overall, the most frequent reported cause of penile fracture was hitting the female pelvis during sexual intercourse, which accounted for nearly 80% of cases ([Table 1](#)). Only 8% of cases were associated with the Taghaandan maneuver, which consists of forcefully bending the shaft of the erect penis to achieve sudden detumescence. Subgroup analysis showed that the Taghaandan maneuver was a frequent cause of penile fracture in Africa and Asia, being responsible for nearly 50% of penile fractures in some series. This etiology is rare in Western countries, although rough masturbation, rolling over in bed onto the erected penis, or urinating with an erect penis are other causes. The Taghaandan maneuver is extremely popular among adolescents in the Middle East, which could explain why patients from Africa and the Middle East were significantly younger than patients from the Western countries in this series.

Clinical Presentation

Many clinical signs can be suggestive of penile fracture ([Table 2](#)). However, in some cases, the diagnosis can pose a real challenge because of the absence of typical signs. Therefore, clinical examination and history taking play important roles in the diagnostic process. The most common finding at examination is a penile hematoma (97.5%), which will be confined to the penis if the Buck fascia is intact but will result in extensive swelling if breached, exhibiting the “eggplant” or “butterfly” sign in the perineum. Penile fracture also is frequently associated with rapid detumescence (79%), penile swelling (86%), cracking sound (69%), penile pain (79%), and rarely penile deviations. Urethral bleeding (14%) and acute urinary retention (7%) indicate possible urethral injury. Often only the clinical diagnosis is used to make the diagnosis, but the role of imaging (ultrasonography [US] and magnetic resonance imaging [MRI]) has recently been advocated to confirm the diagnosis and to help to choose the best surgical approach.^{10,29}

Radiologic Investigations

The role of imaging in the diagnostic process of a penile fracture is still under debate. In most series from this review, radiologic investigations were not performed and the diagnosis was made on clinical grounds only. In the few series in which

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