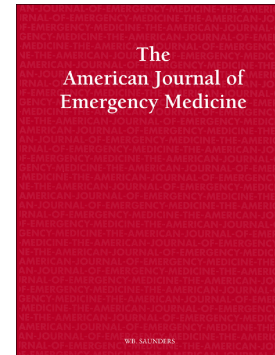


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## Penile Fracture: Surgical vs. Conservative Treatment

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Penile fracture is a relatively uncommon form of urologic trauma, and is defined as blunt direct trauma to the fully erect or semi-erect penis resulting in rupture of the tunica albuginea of the corpora cavernosa [1,2]. Due to a sudden increase in the intracorporeal pressure, over-stretching of the tunica albuginea occurs, causing rupture. Involvement of or injury to the corpus spongiosum, urethra, dorsal nerve and vessels may also be present [3]. Patients typically present with symptoms including sharp penile pain, hearing a 'cracking' sound, rapid detumescence and swelling with or without ecchymosis of the penile shaft [4]. The penis also may be bent or angled toward the side contrary the injury, and ecchymosis may extend in to the scrotum and perineum, as well as the suprapubic and inguinal regions [4]. Treatments of penile fracture have ranged from conservative, including compression bandages, anti-inflammatory agents, and ice, to the more invasive and complicated surgical repair, and all involve a risk of complications [5]. Currently, immediate surgery for a fracture is recommended, and has been shown to be superior to non-operative treatment, however if it is an uncomplicated case without extensive hematoma or concomitant urethral injury, conservative therapy has been shown to yield equally good outcomes [6]. The purpose of this study was to review the injury patterns and treatment of penile fracture in a cohort of patients who presented to the emergency department (ED).

We conducted a retrospective cohort analysis of males presenting to the EDs of seven affiliated hospitals in West Michigan with a diagnosis of penile fracture. All eligible cases were seen between January 2005 and July 2017 (150 months). Patient demographics, presenting complaints, co-morbidities, radiographic studies, treatment in the ED, final disposition, and complications were recorded using a standardized abstraction forms. Operative notes were reviewed to define the extent of penile injuries, and time and type of definitive treatment. Descriptive statistics including frequency tables and confidence intervals were used to summarize the data.

During the study period, 32 patients presented to the ED with a penile fracture. Average age was  $37.2 \pm 12.1$  years with a range of 14 to 59 years. Average duration of symptoms was  $21.7 \pm 33.9$  hours; range 1 to 120 hours. Mechanism of injury included sexual maneuvers (66%), masturbation (13%), manipulation of erect penis (9%), rolling over (6%), and fall onto erect penis (6%). Characteristically, patients heard a cracking sound associated with sharp pain followed by immediate loss of the erection, deformity, discoloration and swelling of the soft tissues. The penis often took on a bizarre shape, with deviation of the penile shaft, usually to the side opposite the tear. The penis may be bent (88%) as well as have ecchymosis confined to Buck's fascia, resulting in massive edema as seen in 15 patients (46%). Additionally, injured fascial compartments lead to an extension of the ecchymosis into the scrotum, perineum, the suprapubic area and the inguinal regions. The ED diagnosis of penile fracture was made clinically in all cases, without the need for ancillary diagnostic tools. Blood was present at the meatus in three patients; urethrography demonstrated a urethral wall tear in five men (16%). Four patients with minimal symptoms had an ultrasound which showed a small tear in the tunica albuginea.

Overall 14/32 patients (44%) were treated conservatively, with outpatient follow-up. Indications for outpatient management included long duration of symptoms, minimal pain/swelling, ability to urinate, and small tears seen on ultrasound. Outpatient treatment included compression bandages and consistent cooling, combined with anti-inflammatory, antibiotic and analgesic therapy. Five patients treated conservatively subsequently returned to the hospital for surgical repair. A total of 18/32 (56%) underwent immediate surgical repair of the penile trauma and no short-term complications were noted. Defects in the tunica albuginea were repaired with sutures and the hematoma was evacuated.

While it is a rare occurrence, the diagnosis of penile fracture can generally be made clinically and does not require further investigation when the patient presents with typical onset and characteristic physical findings, including swelling and ecchymosis of the penis with a deviation toward the side opposite the injury. However, not all patients have a typical history. Ultrasound and retrograde urethrograms, especially in an atypical case, should be performed to rule out other injury and to help determine appropriate surgical treatment. The management of penile rupture includes both conservative treatment and early surgical repair, when indicated, to avoid complications such as persistent clot, angulation, penile abscess and fibrosis. We did not encounter any major complications in either the conservative or surgical treatment groups in our study, however five patients treated conservatively did require subsequent surgery to repair damaged tissue.

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