Fracture With Urethral Injury: Evaluation by Retrograde Urethrogram

Üretral Yaralanma Eşlik Eden Penil Fraktür; Retrograt Üretrogram ile Değerlendirilmesi

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ABSTRACT

Penile fracture is a rare condition. It primarily involves the rupture of the corpus cavernosum during erection, which may also affect the corpus spongiosum and urethra. We describe the case of a 35-year-old man who presented with acute penile pain, penile swelling, and a hematuria after a blunt trauma during sexual intercourse. The emergency retrograde urethrogram revealed a rare condition, extravasation of the opaque material from the penile urethra into the cavernous structure. The partial rupture of the corpus cavernosum with urethral disruption was repaired surgically. At the 3-month postoperative follow-up control, no complications were reported by the patient who has had both normal erectile and voiding functions. In cases of penile fracture with suspected urethral injury, retrograde urethrogram can be used for definitive diagnosis.

Keywords: Penile fracture, urethral injury, imaging, retrograde urethrogram, magnetic resonance

ÖZ

Penil fraktür nadir görülen bir durumdur. Penis ereksiyonu esnasında oluşan travma sonucu öncelikle korpus kavernozum rüptürü oluşur ve bu esnada korpus spongiozum ve üretra da etkilenebilir. 35 yaşında erkek hasta cinsel ilişki sırasında oluşan künt travma sonrasında akut penil ağrı, penil şişlik ve hematüri ile acil servise başvurdu. Acil retrograd üretrogram çekiminde verilen opak maddenin penil üretradan kavernoz yapılara ekstravaze olduğu (nadir görülen) izlendi. Penil üretradaki ve kavernöz yapılardaki parsiyel rüptür cerrahi olarak onarıldı. Hastanın post-operatif 3. aydaki takibinde, komplikasyonun olmadığı ve hastanın ereksiyonunun ve işeme fonksiyonunun normal olduğu gözlendi. Üretral yaralanma şüphesi olan penil fraktur olgularında retrograd üretrogram tanı koyduru cudur.

Anahtar Kelimeler: Penil fraktür, üretral yaralanma, görüntüleme, retrograt üretrogram, manyetik rezonans

Introduction

Penile fracture (PF) is the unilateral or bilateral rupture of the tunica albuginea fibrous tissue enveloping the penis' corpora cavernosa. It is mostly caused by vaginal intercourse or aggressive masturbation exercising blunt force to the erect penis. Partial or complete urethra rupture, dorsal nerve, vein, and artery injury may occur, depending on the force exercised [1].

If there are blood in the meatus, hematuria, and difficulty in voiding, an associated urethral injury should be considered. Immediate retrograde urethrography should be considered if the symptoms of urethral injury are present [2]. The aim of this paper is to present a case of PF with associated urethral injury, diagnosed by retrograde urethrogram.

Case Report

A male patient, aged 35, was referred to the urology clinic complaining of sudden loss of erection during sexual intercourse, penile swelling, hematuria, discoloration, disfigurement, and blood in the urethral meatus urethrorrhagia. These symptoms had emerged 8 hours earlier, and the patient was still able to void in small amounts, with blood present in his urine. During the physical examination, a hematoma in the dorsal penile shaft, pain during palpation, ventral deviation of the penis, and urethrorrhagia were present. Patient's history and a physical examination indicated a PF. The patient's retrograde urethrogram revealed extravasation of the opaque material from the penile urethra into the cavernous structure, which is a condition quite uncommon (Figure 1).

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Figure 1. Urethral injury and rupture of corpus cavernosum in retrograde urethrogram
U: Urethra; CC: Corpus Cavernosum

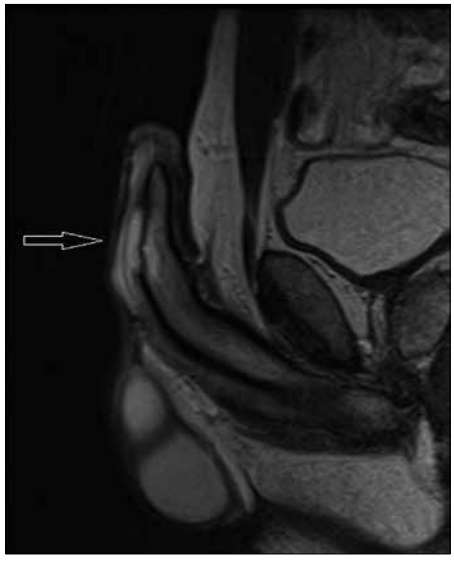

Figure 2. Urethral injury and rupture of corpus cavernosum in magnetic resonance imaging

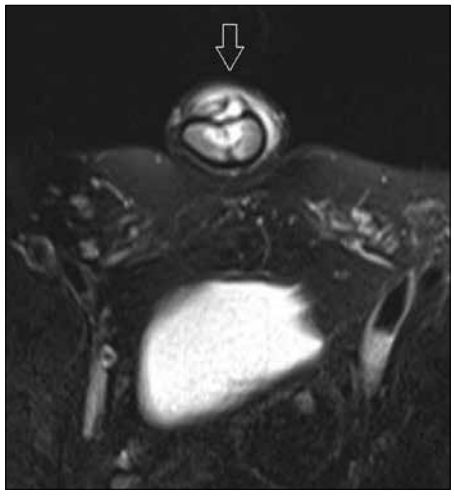

Figure 3. Urethral injury in magnetic resonance imaging

The patient underwent urgent surgical repair. Before the surgical intervention, 1g cefazolin sodium was administered intravenously for prophylaxis.

Following the insertion of a 10-F Nelaton catheter under general anesthesia, a circumferential sub-coronal circumcision was made. The penis skin was degloved until the radix penis. The hematoma present was cleaned, and the evaluation made revealed a rupture in left corpus cavernosum and a 2-cm long urethral disruption (Figures 2, 3). Following the insertion of a 16 F-Foley catheter, the urethra was elevated after sharp and blunt dissections so it was intact again. For repair, 5-0 PDS sutures were used in simple running fashion. To confirm a watertight closure of the tunica and the absence of any other tears or deformities, intra-operative artificial erection was induced with saline solution. The sub-coronal incision was repaired using Vicryl Rapide 4-0 with simple interrupted sutures. After the surgical intervention, the penis was dressed with a pressure bandage. A broad-spectrum antibiotic was administered during the hospitalization period. On the 7th day after the surgical intervention, upon the removal of the catheter, the patient was discharged without any complications. At the 3-month postoperative follow-up control, no complications were reported. Written informed consent was obtained from the patient whose case is reported here.

Discussion

Penile fracture is a urological emergency caused by the rupture of the tunica albuginea of the corpus cavernosum following a blunt trauma to the erect penis [3]. Tunical rupture caused by non-physiological bending of the penile shaft can be in one or two corpus cavernosum, and it may be accompanied by urethral injury. Penile fracture is diagnosed based on the patient's history, clinical examination, and the classic triad: audible "cracking" sound, followed by immediate detumescence and pain [2].

Corpora cavernosa in the tumescent state fills up with blood, and the tunica albuginea thickness decreases from 2 mm to 0.25–0.5 mm. It is thus more prone to traumatic injury. The normal pressure within the erect penis is 100 mmHg. For tunica rupture, 1500 mmHg intracorporal pressure is required [4].

Penile fracture is mostly caused by the bending of the erect penis either over the pubic bone or the perineum of a sexual partner, during brutal masturbation, or penile kneading and snapping to achieve sudden detumescence. A transverse 1 to 2 cm tunical tear, usually unilateral, is present despite reports of tears in both corporeal bodies [5, 6].

Associated urethral injuries have been reported to be 3%, 20%, and 38% in Persian Gulf countries, Japan, USA, and Europe. Urethral rupture occurs subsequent to bilateral cavernosal rupture with an incidence of up to 38% [7]. Much lower percentages of urethral ruptures, up to 3%, are reported in Iran and Japan, where the underlying causes are reasons other than sexual intercourse [8]. Although urethral injuries are not frequent, due to urethra location, they are mainly associated with gross hematuria, urethrorrhagia, or voiding inability. However, the lack of these findings does not mean that urethral injury should be disregarded [5].

Penile fracture diagnosis is mostly made clinically without the need for additional diagnostic tools as the fracture site is obvious. Nevertheless, rolling the swollen skin over a fixed, smooth, rounded, tender lump (or clot), deep to Buck's fascia, the rolling sign, enables definite diagnosis. Cavernosography is to be considered in complicated cases due to the inherent contrast reaction fibrosis from extravasated contrast medium, infection, and priapism risk or only in deep dorsal vein rupture of the penis, which might be indistinguishable from cavernosal rupture [9]. Instead of cavernosography, penis sonography is preferred [10] as it is noninvasive, without risk of infection, and managed conservatively, it enables hematoma resolution monitoring, and there is a 86% detection rate associated with significant false-negative studies [11]. Magnetic resonance imaging (MRI; Siemens, Erlangen, Germany) is another noninvasive and accurate method to show tunica albuginea disruption. However, routine use of MRI is not common due to the costs, limited availability, and time requirements. Still, MRI is reasonable in an atypical presentation and physical findings of PF [12].

Urethral bleeding and voiding incapacity can be symptoms of urethral injury. A retrograde urethrogram should promptly be requested for effective treatment planning and, if the injury is present, simultaneous urethral repair during surgery. If urethral injury is suspected, before catheter placement, an intra-operative flexible cystoscopy is recommended for penile exploration [13].

In the study of Yapanoğlu et al. [14] in which PF experiences were evaluated during 17 years, the authors found that emergency surgical repair was more effective than conservative approach and that emergency surgical repair with the lowest complications should be preferred [14]. PF in a 35-year-old male patient is presented in this paper. The patient who was also suspected for urethral injuries underwent retrograde urethrogram. The retrograde urethrogram revealed a rare condition, extravasation of the opaque material from the penile urethra into the surrounding cavernous structures. The

patient underwent immediate surgical repair due to a partial corpus cavernosum rupture with urethral disruption. During the control in the 3rd postoperative month, the patient had normal sexual and voiding functions.

In the urethral evaluation of patients with PF associated with retrograde urethral injuries, retrograde urethrogram is an option. With better outcomes and fewer long-term complications, early surgery is preferable to conservative management. Furthermore, the surgical repair of the cavernous body can lead to good results, with a favorable prognosis and lowest complication rate.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

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