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Bedside ultrasound diagnosis of urethral calculus in emergency department

Umüt Cakir¹, Ozlem Yigit^{2*}, Mustafa Kesaplı¹, Volkan Celebi¹¹Antalya Training and Research Hospital, Emergency Medicine Clinic, Antalya, Turkey²Department of Emergency Medicine, Faculty of Medicine, Akdeniz University, Antalya, Turkey

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ABSTRACT

A 22-year-old boy presented to the emergency department with penile pain and acute urinary retention. The patient had a tender and painful mass along the distal volar surface of the penis, 5 cm away from the external urethral meatus. Bedside ultrasound was performed in the emergency department. Revealing penile urethral calculus in the emergency department with bedside sonography allowed a prompt diagnosis for the patient without additional invasion or radiation exposing diagnostic modalities such as X-ray, CT or retrograde urethrography.

1. Introduction

The incidence of urethral calculi is less than 2% of all urinary stones^[1]. Urethral stones can occur secondary to urethral stricture or diverticulum (primary stone), but more possible, a stone originated from bladder or kidney can move to the urethra (secondary stone)^[2]. Impacted urethral stone frequently presents with acute urinary retention. In addition, it can cause severe pain and irritative symptoms. Rarely, it can cause more catastrophic problems such as penile gangrene^[3]. While urethral imaging has traditionally been performed with retrograde urethrography (RUG), and more recently ultrasound has been used to minimize the pain associated with RUG and to provide clinicians more detailed information about urethral pathology^[4]. Here we present a case presented to the emergency department with penile pain and acute urinary retention and diagnosed with urethral calculi by bedside ultrasound.

2. Case report

A 22-year-old boy presented to the emergency department with penile pain and acute urinary retention. Upon examination, he was afebrile with normal vital signs. On physical examination, abdomen revealed a grossly distended bladder. The patient had a tender and painful mass along the distal volar surface of the penis, 5 cm away from the external urethral meatus. Bedside ultrasound was performed in the emergency department. And it revealed glob vesicle and a 16 mm hyperechoic stone which provided acoustic shadow, 5 cm proximal of the external urethral meatus. The image of his penis was shown at [Figure 1](#).

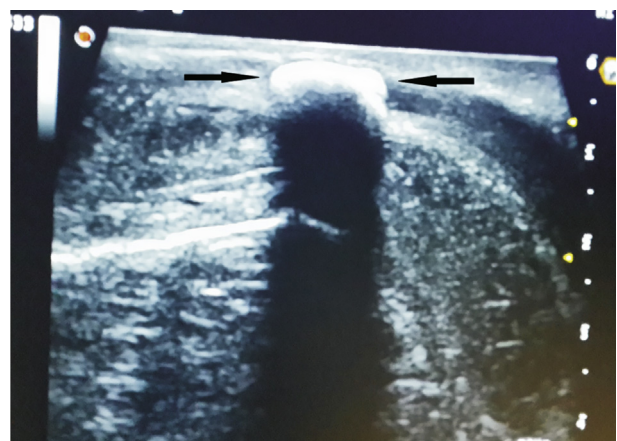


Figure 1. Bedside ultrasound image of the calculus (arrow).

*Corresponding author: Ozlem Yigit, Department of Emergency Medicine, Faculty of Medicine, Akdeniz University, Dumlupınar Bulvarı, Antalya, 07059, Turkey.

Tel: +90 242 2496183

Fax: +90 242 2274490

E-mail: ozlemyigit@akdeniz.edu.tr

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3. Discussion

Urethral calculi are the least common type of urinary calculus. The origin of the calculi that are discovered in the urethra is the upper urinary tract in most patients. Because the lumen of the urethra is comparatively narrow in this portion, most of the calculi in the urethra are trapped in the proximal membranous urethra. However, they may also be seen in the penile urethra^[5]. The diagnosis of stone in the urethra is confirmed by plain X-ray in approximately 98% of cases^[6]. Computed tomography and urography have also been reported with plain films as means of identifying urethral calculi, but both are also associated with radiation exposure. Kamal *et al.*^[6] also reported that 98% of the urethral stones in his study were radio opaque. However, there are some earlier reports presenting that most urethral calculi are radiolucent^[2]. The anterior urethral anatomy and pathology are commonly explored by RUG, but recently sonourethrography and magnetic resonance imaging have been proposed^[7]. Rifkin first described the use of sonourethrography in evaluating the prostatic urethra. The usefulness of sonourethrography in evaluating stricture disease of the anterior urethra was reported to be as effective as RUG in other studies^[8–10]. The use of sonography for the diagnosis of urethral calculus was reported in the literature^[5,11–13]. Bedside sonography is also less painful, easy to use, and permits for concurrent evaluation of the kidneys for hydronephrosis.

The patient herein presented in this case report had acute urinary retention and severe pain. After diagnosing the calculi easily by performing bedside ultrasound, without more complex and additional radiation exposing diagnostic modalities, urology was consulted. The stone was removed with lithotripsy in the operating suite and the patient was discharged home.

Revealing penile urethral calculus in the emergency department with bedside sonography allowed a prompt diagnosis for the patient without additional invasion or radiation exposing diagnostic modalities such as X-ray, CT or RUG.

Conflict of interest statement

The authors report no conflict of interest.

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