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Posttraumatic Urethral Stricture Complicated with Giant Vesical Calculus: Radiologic Findings and a Case Report

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Abstract

Urethral stricture is a narrowing of the urethra caused by scar tissue formation or inflammation that restrict the flow of urine and can lead to various urinary problems.

Giant vesical calculus is an unusually large calculus formed within the urinary bladder, typically weighing more than 100 grams or measuring over 4 cm in diameter, this develops due to long-standing urinary stasis, infection or obstruction.

This is a 35-year-old man who presented on account of inability to pass urine following trauma to the groin, suprapubic pain and discomfort, abnormal sensation radiating to the scrotal sacs and bilateral lumbar region pain and discomfort for almost four years duration. He had suprapubic urethral catheter insitu, and came for plain pelvic radiograph, retrograde urethrocytography (RUCG) and micturating cystourethrography (MCUG).

The plain radiograph demonstrated a pyramidal shaped opacity of calcific density in the pelvic cavity measuring about 68mm x 40mm in craniocaudal and mediolateral dimensions. The RUCG demonstrated a complete stricture at the bulbomembranous urethra, while MCUG demonstrated the previously described calculus with nondemonstration of the posterior urethra and bilateral moderate vesico-ureteric reflux.

A diagnosis of severe and complete posttraumatic stricture at the bulbomembranous urethra with associated giant vesical calculus and bilateral vesicoureteric reflux in a 35-year-old man was established.

We present a case of giant vesical calculus in a patient with posttraumatic urethral stricture due to its rare occurrence, peculiar presentation and to review the literature.

Keywords: Urethral Stricture, MCUG, RUCG, Giant Calculus

Introduction

Giant urinary bladder calculi are regarded as calculus weighing more than 100g or measuring greater than 4 cm in widest diameter, and appears rare in current practice ^[1, 2].

Giant urinary bladder calculus appears more frequent in males, and often develops from a nidus of infected material or single ureteric calculus with a progressive layer-wise deposition of calcified matrix coexisting with factors leading to urinary stasis such as bladder outlet obstruction ^[1, 3].

Bladder calculi constitute about 5% of the total number of urinary tract stones; they are more common in adult males especially in the fourth decade and more prevalent in countries like Middle East, North Africa, Thailand and Myanmar ^[4-7].

In the formation of vesical calculi, there are associated risk factors which may include cystitis, foreign bodies in the urinary bladder, low socioeconomic status, dietary habits, and exposure to sun ^[4, 8].

Presentation in subjects with bladder calculi may include persistent lower urinary tract symptoms, hematuria, recurrent urinary tract infections and urinary retention ^[6, 9]. Complications associated with bladder stones though rare can be hydronephrosis progressing to renal failure ^[6, 10].

Bladder stones almost always occur in association with renal or urethral calculi, and may rarely occur without coexisting upper urinary tract calculi, and could either be termed primary or secondary in origin ^[11, 12].

Most of vesical calculi are radio-opaque, and composed of triple phosphate, calcium oxalate, and calcium carbonate ^[13, 14].

Bladder calculi are most often opaque on plain radiography, they are also demonstrated following ultrasonography, the plain

radiography (KUB) often show peculiar topographic characteristics with respect to calculus size, surface and radio-opacity [15].

The management of vesical calculus is most often aimed at relieving obstruction, treating the accompanied urinary infection and surgical removal of the calculus; the surgical removal of the calculus is from an open lithotomy (extraperitoneal cystolithotomy), or the endourological procedures and percutaneous cystolithotomy [16, 17].

Case Report

This is a 35-year-old man who presented on account of inability to pass urine following trauma to the groin, suprapubic pain and discomfort, abnormal sensation radiating to the scrotal sacs and bilateral lumbar region pain and discomfort for almost four years duration. He had suprapubic urethral catheter insitu, and came for plain pelvic radiograph, retrograde urethrocytography (RUCG) and micturating cystourethrography (MCUG).

The patient is a young man, conscious and alert, not in any respiratory distress and not anemic. He had a supra-pubic catheter draining cloudy and blood stained urine. The patient was observed to have tenderness over the supra-pubic region and along the penile shaft following palpation. The urine microscopy revealed pus and red cells and the culture grew *E.coli*.

The plain radiograph demonstrated a pyramidal shaped opacity of calcific density in the pelvic cavity with a lamellated appearance and measuring about 68mm x 40mm in craniocaudal and mediolateral dimensions (Fig 1). The RUCG demonstrated a complete stricture at the bulbomembranous urethra (Fig 2), while MCUG demonstrated the previously described calculus with nondemonstration of the posterior urethra and bilateral moderate vesico-ureteric reflux (Fig 3).

A complementary ultrasound demonstrated a huge curvilinear echogenicity with marked posterior acoustic shadowing in the lumen of the urinary bladder, associated mobile echoes most likely from cystitis and hematuria, there is circumferential bladder wall thickening of about 12mm, bilateral hydronephrosis (moderate) with supra-pubic catheter balloon noted within the bladder lumen. Perivesical lymphadenopathy of less than 20mm was also demonstrated around the urinary bladder most likely from on-going infective/inflammatory process.

A diagnosis of severe and complete posttraumatic stricture at the bulbomembranous urethra with associated giant vesical calculus and bilateral vesicoureteric reflux in a 35-year-old man was established.

We present a case of giant vesical calculus in a patient with posttraumatic urethral stricture due to its rare occurrence, peculiar presentation and to review the literature.

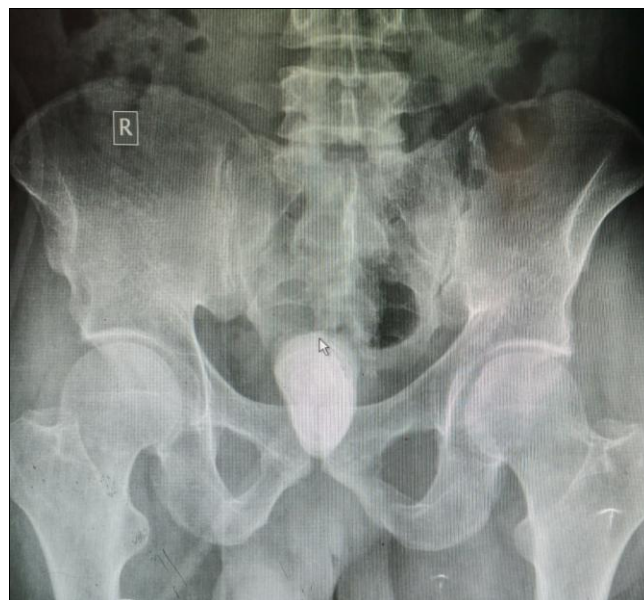


Fig 1: Plain radiograph of the pelvic bone demonstrating a near oval/pyramidal shaped opacity of calcific density having a lamellated appearance measuring about 68mm x 40mm in craniocaudal and mediolateral dimension within the pelvic cavity in keeping with the giant vesical calculus. The demonstrated bones show no fracture



Fig 2: An image from RUCG demonstrating an abrupt cessation to the flow of contrast/contrast column at the bulbomembranous urethra with associated ballooning of the pre-stenotic urethra and periurethral smearing of contrast; these are in keeping with severe and complete stricture. The aforementioned giant calculus with lamellated appearance is still demonstrated within the pelvic cavity



Fig 3: An image from MCUG demonstrating a contrast filled urinary bladder with slightly irregular outline and an inferior filling defect; the giant calculus, bilateral reflux vesicoureteric reflux more on the right and non-demonstration of the entire urethra due to inability to micturate from urethral obstruction

Discussion

Giant urinary bladder calculi are regarded as calculus weighing more than 100g or measuring greater than 4 cm in widest diameter, and appears rare in current practice [1, 2]. The case under review has a bladder stone measuring about 68mm x 40mm in dimension, and therefore termed a giant calculus in conformity to these literatures.

Giant urinary bladder calculus appears more frequent in males, and often develops from a nidus of infected material or single ureteric calculus with a progressive layer-wise deposition of calcified matrix coexisting with factors leading to urinary stasis such as bladder outlet obstruction [1, 3]. The affected individual happens to be a male with complete urethral stricture, and the calculus also showed layers (lamellated appearance), thereby agreeing with these literatures.

Bladder calculi constitute about 5% of the total number of urinary tract stones; they are more common in adult males especially in the fourth decade and more prevalent in countries like Middle East, North Africa, Thailand and Myanmar [4-7]. The patient had a vesical calculus, an adult male but in the third decade of life and lives in West Africa. In the formation of vesical calculi, there are associated risk factors which may include cystitis, foreign bodies in the urinary bladder, low socioeconomic status, dietary habits, and exposure to sun [4, 8]. The case under review has an outlet obstruction leading to urinary infection, he is from the low socioeconomic class and in an environment with high temperatures; these are all associated risk factors in vesical calculi formation. These are conforming to the aforementioned literatures.

Presentation in subjects with bladder calculi may include persistent lower urinary tract symptoms, hematuria, recurrent urinary tract infections and urinary retention [6, 9]. The case under review had lower urinary tract symptoms,

hematuria with urine retention, thereby conforming to these literatures.

Complications associated with bladder stones though rare can be hydronephrosis progressing to renal failure [6, 10]. The case under review has some of the complications especially from stasis, some of which are hydronephrosis from ultrasonography and reflux vesicoureteric reflux from MCUG, thereby agreeing with these literatures.

Bladder stones almost always occur in association with renal or urethral calculi, and may rarely occur without coexisting upper urinary tract calculi, and could either be termed primary or secondary in origin [11, 12]. The case under review has no coexisting renal or urethral calculi and most likely of primary origin, thereby conforming to these literatures.

Most of vesical calculi are radio-opaque, and composed of triple phosphate, calcium oxalate, and calcium carbonate [13, 14]. The case under review is not an exception; it is opaque on plain radiograph and therefore most contain calcium, this conforms to these literatures.

Bladder calculi are most often opaque on plain radiography, they are also demonstrated following ultrasonography, the plain radiography (KUB) often show peculiar topographic characteristics with respect to calculus size, surface and radio-opacity [15]. The vesical calculus in this patient is opaque following KUB; where the location, shape, size and topographic characteristics were demonstrated, it also appeared echogenic from ultrasound imaging. These features are in conformity with the aforementioned literatures.

The management of vesical calculus is most often aimed at relieving obstruction, treating the accompanied urinary infection and surgical removal of the calculus; the surgical removal of the calculus is from an open lithotomy (extraperitoneal cystolithotomy), or the endourological procedures and percutaneous cystolithotomy [16, 17]. The case under review is being planned for urethroplasty to relieve the obstruction and subsequently open bladder surgery for the removal of the giant vesical calculus by the urologist, thereby conforming to these literatures.

Conclusion

Basic radiologic examinations like plain pelvic radiography with ultrasonography are capable of demonstrating the presence and topographic characteristics of vesical calculus, thereby enabling the institution of further investigation on the cause and also enabling institution of appropriate management to prevent obstructive uropathy and nephropathy.

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