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Expert Opinion Article

"Case Report of an obstructed Urethral Meatus Stone of Unexpected Size: A Brief Literature Review"

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Abstract
Background: Urolithiasis is a common urinary system disorder and the second most prevalent condition affecting the urinary tract, often with high recurrence rates. Stones typically form in the kidney, ureter, or bladder, presenting with various clinical manifestations. The urethral meatus is a rare site for stone formation. One clinical manifestation is urinary retention (UR), which may be acute or chronic, arising from obstructive, infectious, inflammatory, pharmacologic, neurologic, or other causes. Distal urethral meatus calculi are particularly uncommon among obstructive causes.
Objective: Reporting a Rare Case Presentation of Distal Urethral Meatus Calculus Causing Urinary Retention.
We report the case of a 58-year-old male, non-diabetic non hypertensive patient who reported at Surgical OPD at KAHER's KLE Ayurveda Hospital, Belagavi, for the complaints of swelling at the tip of the glans penis, urinary retention with slow dribbling of drops of urine and pain at the tip of the penile area since 2 day. Physical examination revealed an impacted calculus sized about 43.8x17.0 mm was seen at the urethral meatus. Who was advised to undergo meatotomy. Considering anatomy of distal urethra and location of stone in the present case gives rarity for this case report

Key-words: Acute Urinary Retention, Distal Urethral Meatus calculus, Meatotomy, stone.

Introduction

Urolithiasis is a common condition encountered in the emergency department (ED), typically presenting with calculi located in the kidney, ureter, or bladder. However, obstructing calculi in the urethra is a rare presentation, often associated with urinary retention, and its management is unique to its location. [1] There are varying opinions regarding the frequency of acute urinary retention caused by urethral calculi, with some considering it a frequent occurrence, while others suggest it is infrequent or virtually nonexistent. The position of the stone and the anatomical pathology of the urethra significantly influence the treatment strategy. Urethral stones are often radiolucent, and uroradiographic diagnosis is only made in approximately 40% of cases. [2] The incidence of urethral stones is endemic in the Middle East and Asia. [3] Urethral calculi account for less than 0.3% of all urinary calculi cases, and 88% of them are located in the posterior urethra. This can result from various causes, including the migration of stones from the bladder or upper urinary tract, urethral strictures, and obstructing tumors such as adenomatous metaplasia of the uroepithelium. Other rarer causes include hypospadias, urethral diverticula, and primary fossa navicularis calculi. [4] Most stones in the urethra are the result of migration, rather than being formed primarily in the urethra. Considering the average length of the male urethra is about 18–20 cm, with a diameter of approximately 6 mm, [5] it is highly unlikely for a distal urethral stone with a diameter of 17 mm to migrate from the bladder or upper urinary tract into the urethral meatus. Stones in the urethra are usually small in size, but there are limited case reports and literature reviews regarding the management of urethral calculi in the emergency setting. This case report discusses the clinical presentation, physical examination, imaging studies, diagnosis, and manual removal of a urethral calculus.

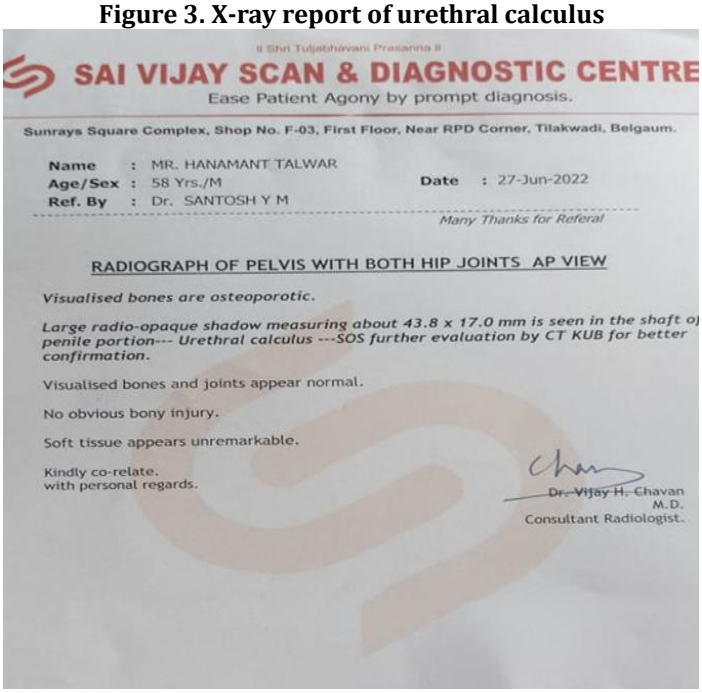
Case History:

A Hindu married 58 years old male non diabetic, non-hypertensive patient was presented with complaints of swelling at penile region since two months, associated with whitish discharge, burning and dribbling micturition since 8 days, and inability to pass urine since two days. He had similar complaints 20 year back and was diagnosed as

distal urethral calculus diameter sized approximately of 1 cm present at urethral meatus which has passed without any medical intervention. (Reports were not available with patient) The case was reported on 27th June 2022 [Opd number - 220026451] at Surgery OPD, KLE Ayurveda Hospital Shahpur, Belagavi. He had no significant history of previous surgical procedures with any relevant family history. On Systemic examination, he was conscious, oriented with no signs of dehydration. His pulse rate was 70 per minute with a blood pressure of 110/80 mm Hg. On Local examination by palpation a distended bladder was noted with stony hard swelling over the glans penis and no visualization of the urethral meatus due to impacted Stone was revealed. (figure1) On further radiological investigation by X – ray of pelvis with both Hip -joint AP view revealed the presence of a large radio-opaque shadow measuring about 43.8x17.0mm seen at the tip of Urethral Meatus of penile portion – urethral calculus (Figure 2,3) later on the patient was advised for surgical intervention by meatotomy.

Figure 1. Physical exam showing location of stone. Figure 2. X-ray appearance of a primary fossa navicularis calculus

Figure 3. X-ray report of urethral calculus



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Ref. By : Dr. SANTOSH Y M

Many Thanks for Referal

RADIOGRAPH OF PELVIS WITH BOTH HIP JOINTS AP VIEW

Visualised bones are osteoporotic.

Large radio-opaque shadow measuring about 43.8 x 17.0 mm is seen in the shaft o penile portion--- Urethral calculus ---SOS further evaluation by CT KUB for better confirmation.

Visualised bones and joints appear normal.

No obvious bony injury.

Soft tissue appears unremarkable.

Kindly co-relate.
with personal regards.

Dr. Vijay H. Chavan
M.D.
Consultant Radiologist.

Discussion-

It is noted that the patient reported untimely to the doctor and the justification for same could be the partial obstruction with dribbling of urine in the early stage later on the complete obstruction made the patient to consult the doctor. Urethral calculus is a very rare pathological entity, with an incidence lower than 0.3% of all urinary lithiasis. They are most often seen in children because of the high frequency of bladder stones, and rarely observed in women due to the anatomic peculiarities of the female urethra. (Like less curvature urethra) They are most often secondary to a urethral pathology, in young adults and exceptionally developed on a normal urethra, it is preferentially localized at the posterior urethra, and very rarely at the anterior urethra, they can be solitary or multiple. [6] These can be migrant or native and often present as urinary retention, perineal and rectal pain, or external meatus and urethral pain. Migrant stones develop in the kidney or bladder and migrate into the urethra. Native urethral stones form in the urethra and are associated with strictures, urethral diverticula, chronic infection, and urethral foreign bodies. [7] (which were not observed in the reported case) Commonly Calcium oxalate and cystine stones formed mainly from the kidneys, while struvite and uric acid stones originate from the bladder. Diagnostic imaging methods for urethral stones include radiograph of the abdomen and pelvis or retrograde urethrogram, point-of care ultrasound (POCUS). In most cases of penile urethral calculi, a stone is palpable along the expected urethral course on examination. Nearly 100% of urethral calculi are radiopaque and can be visualized with plain radiographs. Some ultra sound studies ruled out anatomic variations such as urethral diverticula where migratory stone would get obstructed. The presence of these anatomic variations would have made manual removal of the stone more complicated. The treatment remains poorly standardised, they depend on the size, the number, the localization of the calculus as well as the presence or not of an underlying urethral pathology, for stones in the anterior urethra, and “milking” has been reported to be successful in several case reports. For calculi that cannot be removed with simple manipulation, minimally invasive endoscopic approach by urethroscopy is to be preferred for small proximal calculi. For a large, multiple, distal stones and stones encrusted in the urethra, conventional open surgery with a meatotomy or sometimes an urethrotomy with or without urethroplasty can be done. An acutely impacted urethral stone which are undiagnosed and left untreated can lead to severe pain, urinary retention, urethral injury, obstructive renal failure, abscess and even penile gangrene. This may cause incontinence, impotence, urethra-cutaneous fistulas, and post-obstructive renal failure [7]. This indicates the importance of a timely diagnosis and treatment. [7]

Conclusion-

Although urethral stones are still a relatively uncommon cause of acute urinary retention in men, their presence does not absolve the patient from undergoing a thorough examination of their entire urinary system to rule out calculi or underlying urethral pathology.

Key Messages

- UR, due to such a huge calculi at the urethral tip is rare.
- The presence of such a huge stone at a urethral tip is rarely seen.
- Pathology of calculi Formation at the urethral tip cannot be explained.

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