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RESEARCH ARTICLE

GIANTS BLADDER STONES WITH ACUTE RENAL FAILURE IN PATIENT WITH A UNDIAGNOSED NEUROLOGICAL BLADDER DUE TO A SPINAL CORD INJURY : UNCOMMON CASE

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Abstract

Urinary tract stones are common in spinal cord injury patients, affecting both the upper and lower urinary tracts. However giant bladder stones are rare, defined as those weighing more than 100 grams, although rare, pose significant clinical challenges and often result from underlying factors such as neurogenic bladder dysfunction. We present the case of a 35-year-old tetraplegic who was admitted with deteriorating general health and subsequently diagnosed with a massive bladder stone leading to acute renal failure. This case highlights the importance of early urological assessment in patients with neurological bladder problems. It also highlights the social taboo surrounding urogenital problems, which can delay necessary medical intervention.

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Introduction:-

Neurogenic bladder dysfunction is common after spinal cord injury, affecting over 90% of those affected[1]. The association between spinal cord injury and neurogenic bladder emphasises the need for appropriate management to reduce the risk of bladder stone formation[2]. Although bladder stones are common, they are usually small and present minimal treatment challenges. However, cases of large stones that fill much of the bladder are clinically uncommon[3]. In this context, we present a remarkable case of a 35-year-old tetraplegic patient who was urgently admitted for obstructive renal failure due to significant bladder stone formation. Treatment options depend on the size of the stone, with laparotomy recommended for large or giant stones.

Patient and Observation:-

A 35-year-old tetraplegic patient with no prior urological follow-up was admitted to the emergency department as a result of childhood cervical spine trauma. There was no personal or family history of urinary stone complications. Despite a stable and fever-free clinical presentation, a palpable, firm mass in the lower abdomen was noted on physical examination. Blood analysis revealed renal insufficiency with serum creatinine of 243 $\mu\text{mol/l}$, urea of 23.5 mg/dl and hyperkalemia of 6.2 mEq/l. However, the electrocardiogram showed no irregular electrical activity. CT scans showed bilateral renal pelvic dilatation, suggesting possible obstruction, and the identification of two large stones - one measuring 8 cm in the bladder and another 6 cm in the prostatic urethra. After unsuccessful bladder catheterisation, bilateral nephrostomies were performed. After a 48-hour interval, suprapubic cystostomy was performed to remove both stones, which measured 8.3 cm (270 grams) and 5.9 cm (180 grams), respectively. Postoperative recovery was uneventful. Stone composition analysis revealed predominantly calcium phosphate. Normal biological test results were complemented by a bladder ultrasound which showed a significant post-void

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residual volume. Urodynamic evaluation confirmed the diagnosis of detrusor overactivity with detrusor sphincter dyssynergia and reduced bladder compliance typical of suprasacral spinal cord injury. Consequently, Hetero-catheterisation was initiated for management.

Discussion:-

After spinal cord injury, the loss of sensory and motor function can lead to secondary urological complications, such as neurogenic lower urinary tract dysfunction, which is associated with a risk of several urological complications, including renal failure, bladder cancer, urinary tract infection, incontinence, and morphological changes of the bladder and urethra.[1] [2]

In addition, bladder stones are a common complication of neurogenic lower urinary tract dysfunction. In general, the risk of developing bladder stones is increased by recurrent urinary tract infections with urease-producing organisms, incomplete emptying of the bladder, use of permanent catheters, immobilisation and hypercalcuria.[1] Bladder stones can cause recurrent urinary tract infections, haematuria, catheter obstruction and bladder irritation with autonomic dysreflexia in spinal cord injury patients with a level of injury above T6[4].

Large bladder stones are often found in patients with other comorbidities that may overshadow the urinary symptoms[5].Bladder stones usually occur as single entities, but in cases of urinary retention, about 25-30% of cases may involve multiple stones. Giant bladder stones usually originate from a single nidus, which may be infected material, a foreign body or a ureteral stone that has passed into the bladder. However, the fusion of several bladder stones can also contribute to their formation[6]. While bladder stones are often associated with renal or ureteral calculi, they can also develop independently of upper urinary tract stones, as was the case in our patient.

The development of bladder giant stones is a gradual process over several years. In our scenario, the development of these bladder macrolithiasis was exacerbated by social factors. Topics related to urogenital health are often considered taboo, making patients uncomfortable discussing such issues openly. As a result, our patient sought medical attention only at an advanced stage.

In contrast to the relatively common occurrence of giant bladder stones reported in case studies, there are fewer documented cases of giant bladder stones leading to renal failure in the literature. This is because bladder stones typically move within the bladder and rarely obstruct urine flow or cause kidney failure[7]. However, if left untreated, they can become lodged in the bladder neck or put pressure on the ureteral orifices, leading to obstructive uropathy[8], as in our case.

The approach to treating bladder stones depends on factors such as size, location, density and quantity[9]. Conservative methods may include urine alkalinisation for uric acid stones with a urine pH above 6.5. Extracorporeal shock wave lithotripsy (ESWL) is an alternative, especially for patients at high risk of anaesthesia or who have concerns about invasive procedures[10]. However, ESWL is less effective for stones larger than 2 cm.[11]

Surgical options for bladder stone removal include transurethral lithotripsy or open surgery. Open surgery is usually considered a last resort after endoscopic methods have failed. Transurethral lithotripsy, although less invasive, is less effective for giant bladder stones, especially if there are severe urinary tract infections. It also increases the risk of infection, post-operative complications and prolongs the length of surgery.[12]

Conclusion:-

Neurogenic bladder dysfunction, often seen in conditions such as spinal cord injury, can predispose individuals to bladder stone formation due to impaired bladder emptying and urine retention. The management of neurogenic bladder and associated bladder stones requires a comprehensive approach. In cases where large bladder stones are present, surgical procedures such as cystolithotomy may be required to remove the stones and prevent complications. Early detection, appropriate treatment and regular follow-up are essential to preserve renal function and improve the quality of life of people with neurogenic bladder and bladder stones.

Figure 1:- An X-ray image of the urinary tract showing two opaque images of calcium tone in the bladder area.



Figure 2:- A CT scannimages showing two lithiasis formations in the bladder, the first measuring 8 cm and the second measuring 6 cm and embedded in the prostatic urethra.

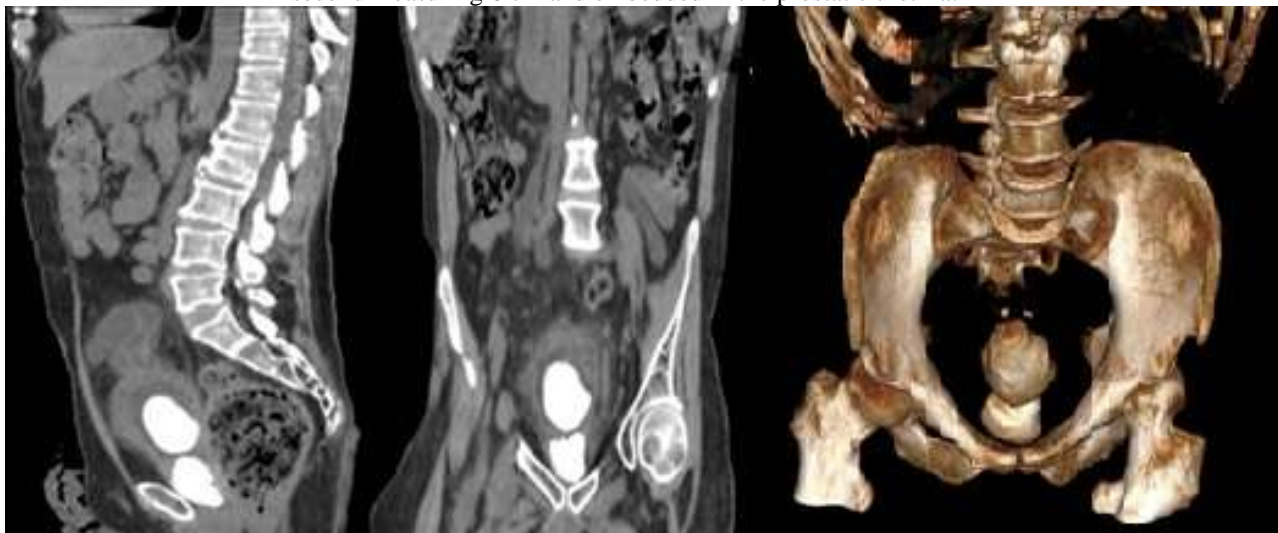


Figure 3:- Post-operative image of stones measuring 8.3cm and 6cm.**Competing interests:**

The authors declare no competing interests.

Informed Consent:

The patient's consent was voluntary and informed.

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