

Background

Referred scrotal pain

- Scrotal pain can be due to pain referral from a variety of extra-scrotal locations. While it is known that ureteral stones can cause referred pain to the scrotum, it is an uncommon presentation that can be overlooked when evaluating a patient with scrotal or testicular pain.¹
- Embryologically, the testes originate within the abdominal cavity before descending into the scrotum, making the scrotum susceptible to referred pain from abdominal sources, such as obstructing ureteral stones, hernias, abdominal aneurysms, and tumors.²
- Nociceptors of sensory neurons play a key role in transmitting pain signals. The genital branch of the genitofemoral nerve originates from lumbar nerve roots L1–L2 and innervates the sensory input for the anterolateral scrotum. Originating from the L1 nerve root, the ilioinguinal nerve is responsible for sensation at the base of the penis, superior scrotum, and medial thigh. The pudendal nerve comes from sacral nerve roots S2–S4 and innervates the posterior scrotum. Additionally, the superior, middle, and inferior spermatic nerves are believed to play a major role in transmitting pain in chronic scrotal pain.^{2,3} There is significant overlap of the nerves, therefore, any organ sharing the same nerve pathway, such as the ureter, can lead to referred pain.²
- In the context of ureteral stones, the mechanism for referred pain is thought to be due to the obstructing stone causing inflammation of the ureter which then irritates the genitofemoral nerve at the location the ureter crosses over it. The genitofemoral nerve runs along the psoas muscle and crosses under the ureter at the L4 level.⁴
- A study involving 44 cases of ureterolithiasis described renal colic as an incapacitating pain that gradually developed in the ipsilateral back (65%), iliac fossa (32%), or testicle (3%).⁵ Additionally, a retrospective review focused on patients who underwent scrotal color Doppler ultrasound for evaluation of acute scrotal pain which was later attributed to a ureteral stone, identified three men with acute scrotal pain secondary to ureteral stone at a single institution over a 3-year period.⁴

Case Report

- Our patient is a 70 year old male** who presented with bilateral testicular pain described as sharp and stabbing, which commenced in April 2022 and was severe enough to disturb his sleep. Pharmacologic treatment failed to alleviate the pain, although occasional relief was reported when laying down.
- The patient's initial complaints of testicular pain were investigated through ultrasound, revealing findings of a right epididymal head cyst and a left varicocele. Evaluation of microscopic hematuria in September 2022 showed kidney stones, including a 7 mm stone in the upper pole collecting system and a 12 mm stone in the renal pelvis. Due to the persistent and severe nature of his testicular pain, a bilateral orchiectomy was requested by the patient.
- In October 2022, bilateral orchiectomy was performed, but the patient continued to suffer from intense pain, which was thought to be nerve-related or phantom pain. The patient was referred to pain management.

Presentation to Pain Management:

- In February 2023, the patient presented with a history of bilateral testicular pain spanning 10 months, which persisted despite the orchiectomy.
- A bilateral genitofemoral nerve block was performed, resulting in short-term pain improvement. Five days post-procedure, the patient reported a sharp right-sided pain originating from the groin and extending to the right scrotum, which was relieved by lying down.

Resolution:

- Further evaluation revealed microscopic hematuria, and a CT urogram in March 2023 identified multiple nonobstructing right renal stones, including a 1.6 cm stone within the right ureteropelvic junction (Figure 1), as well as circumferential wall thickening at the right ureteropelvic junction.
- A cystoscopy confirmed the presence of a right renal stone with inflammatory changes at the right ureteropelvic junction, and the patient underwent Extracorporeal Shock Wave Lithotripsy (ESWL) for treatment in April 2023. Subsequent imaging showed a positive response to ESWL.
- Two weeks post-procedure, the patient reported a complete resolution of his chronic scrotal pain.

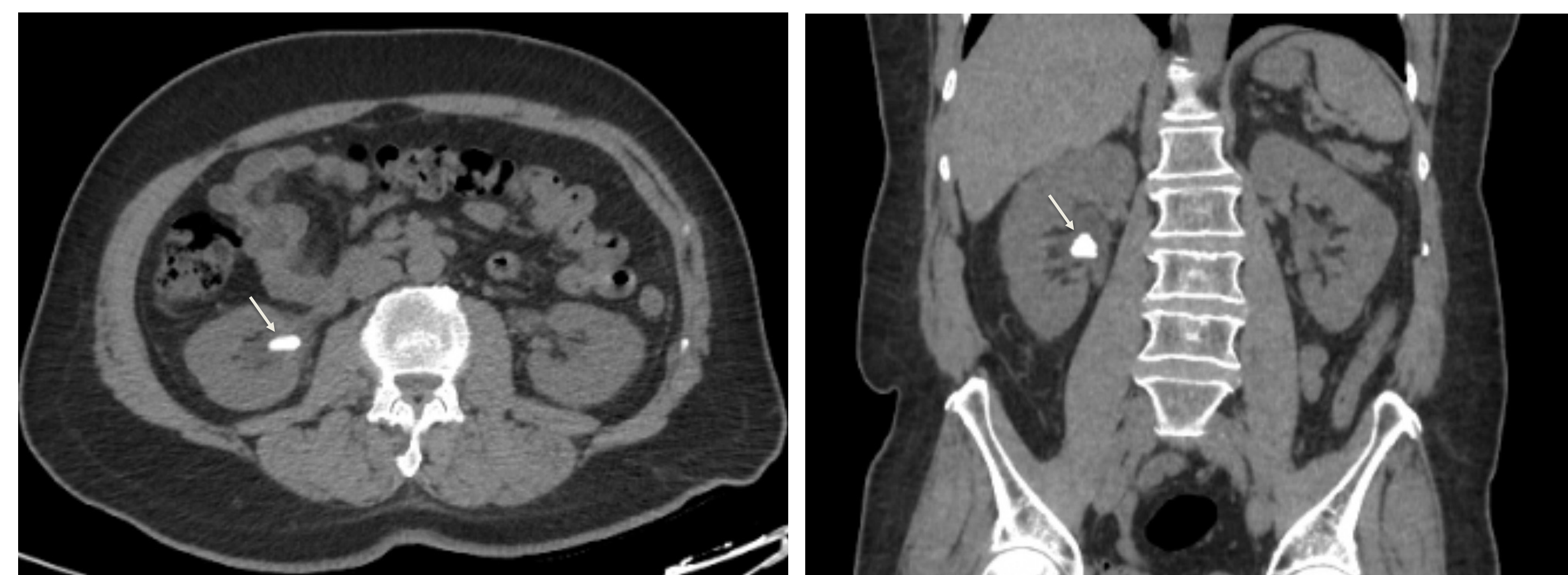


Figure 1. Axial (left) and coronal (right) CT of a 1.6 cm stone within the right ureteropelvic junction.

Discussion

This case demonstrates the importance of considering referred pain from extra-scrotal locations in the differential diagnosis of scrotal pain.

- The patient endured intense scrotal pain for an extended duration of one year, mainly due to a lack of recognition regarding the potential contribution of his ureteral stones as the underlying cause of the symptoms. It is noteworthy that the patient independently requested a bilateral orchiectomy, a procedure that is usually reserved as a last resort for chronic scrotal pain.³ Perhaps surgery could have been avoided if the possibility of ureteral stones causing his pain had been considered.
- The patient's description of pain relief upon laying down indicates an intriguing aspect of the presentation. Despite investigations describing the stones as nonobstructing, the observation that pain subsided in the supine position suggests that the stones might have been causing intermittent obstructions when the patient stood up.
- Our patient reported temporary pain relief with a bilateral genitofemoral block. A diagnostic spermatic cord block is useful during the initial evaluation of chronic scrotal pain. A positive response to the block assists in identifying whether the nerves within or around the spermatic cord play a role in the pain mechanism.³
- Prior case reports about this unusual presentation include a case where right ureteropelvic junction obstruction led to right testicular pain and a case illustrating pain resulting from intermittent obstruction by a ureteral calculus in the lower ureter.^{1,5}
- Patients with chronic scrotal pain seek consultation with numerous physicians from different specialties, including an average of four to five urologists, leading to frustration and financial burden.³
- The collective evidence from these case reports and studies underscores the need for timely recognition and appropriate management to improve patient outcomes.

References

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