

## Case Report

# Urinoma: a rare complication of ureteral calculi

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### ABSTRACT

Urinoma is a collection of extravasated urine either in renal subcapsular or perirenal space. It is caused by obstructive and non-obstructive pathologies. It is rare; with trauma as most common cause in adults and ureteral stones as least common. It mimics symptoms of ureteral stone. CT KUB is best modality to detect it. Here we present a case of ureteral calculi leading to urinomas formation in a 42 years old male patient present with retention of urine and pain in left flank region with nausea, vomiting and fever.

**Keywords:** Urinoma, Renal trauma, Ureteral calculi, UTI

### INTRODUCTION

Urinoma usually results when the urine extravasates from the urinary tract such as kidney, ureter, bladder, or urethra. These urinomas can be unilateral or bilateral. They can be symptomatic or asymptomatic. These can manifest as a confined or encapsulated collection or as free fluid mimicking ascites.<sup>1</sup> There are two types of urinomas which are encapsulated collections of extravasated urine in a) the subcapsular space called as subcapsular urinoma b) perirenal space called perirenal urinoma. It was previously considered that urinomas had a protective effect on renal function, recent studies have questioned the protective effect concept as some patients showed impaired renal function in the kidney ipsilateral to the urinoma.<sup>2,3</sup> Patil et al. proved that there was no difference in renal function in patients with urinoma with ascites and even in controls.<sup>2</sup> Wells et al showed that the pop-off mechanism of urinoma significantly protects long term global renal function.<sup>4</sup>

### CASE REPORT

Our case involved a 42 year old male who came to emergency department with chief complaints of left-sided

flank pain since 5 days, fever, nausea, vomiting and unable to pass urine since 1 day. Patient was a known case of left renal calculi and history of similar complaint 1 year back. The patient did not use tobacco products, alcohol or abused drugs. On physical examination the temperature was 98.4 F, pulse 70, blood pressure 140/96 mmHg, respiratory rate 16. Abdomen was soft, with tenderness in left lumbar region, no guarding or rigidity, bowel sounds were present. The remainder of the physical examination was within normal limits. Laboratory studies upon admission: Haemoglobin 12.9 g/dl, haematocrit 37.1%, leukocytes 3100/uL with 62% polymorphonuclears, platelets 148,000/uL; sodium 138 mEq/L, potassium 4.4 mEq/L, chloride 108 mEq/L, blood urea nitrogen (BUN) 33 mg/dL, serum creatinine 2.2 mg/dl, glucose 128 mg/dl, albumin 3.5 g/dL. The urine analysis showed: small blood, protein >300 mg/dL, glucose 100 mg/dL, WBC 5-10, RBC 0-3, bacteria 2+, leukocyte esterase moderate, nitrite negative. Extended spectrum beta-lactamase producing *Escherichia coli* grew in the urine cultures. Treatment for pyelonephritis was started with parenteral broad spectrum antibiotic. Renal ultrasonography (Figure 1), performed on suspicion of possible nephrolithiasis, revealed mild to moderate left sided hydronephrosis, and collection in left subcapsular

and pararenal space, bilateral echogenic kidney, thickened bladder wall.



**Figure 1: USG showing hydronephrosis of left kidney.**

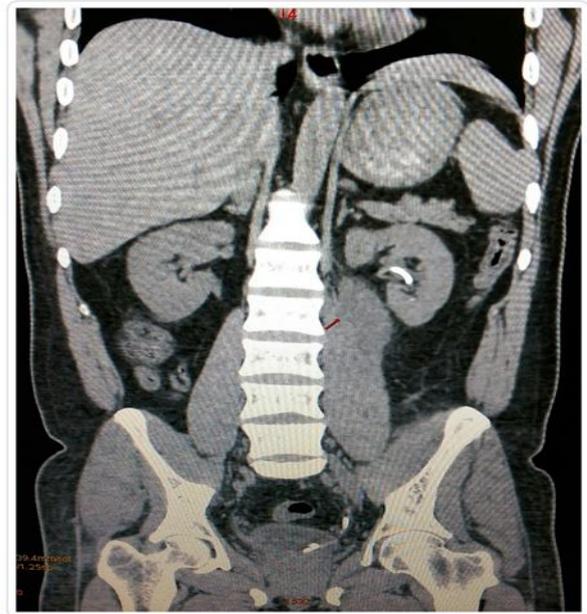
Computed tomography KUB was done (Figure 2) showed a large obstructive calculus 12mm in the left mid ureter. Few proximal small calculi are also seen in mid ureter. There is moderate dilatation of pelvicalyceal system. Defect is noted in left proximal ureter. Large bilobed collection 5.4 x 3 x 10 cm is noted in the retro peritoneum in the posterior para renal space and extending along left psoas muscle.



**Figure 2: CT scan showing urinoma.**

Collection is seen communicating with the defect in the proximal ureter. The findings were interpreted as consistent with an urinoma secondary to the obstructive left ureteric calculus. The patient then underwent cystoscopy with stone removal and ureteral stent placement. The perirenal and subcapsular collections, the flank pain, nausea, vomiting all subsequently started to resolve, by 1 week a CT scan was done to check for

decrease in size of urinoma (Figure 3). The Urinoma resolved by 3week.



**Figure 3: CT scan Post Op. after 1 week showing resolving urinoma.**

## DISCUSSION

Urinomas may be caused by either obstructive or non-obstructive pathology. Obstructive causes are:

1. pregnancy
2. ureteral calculi
3. pelvic masses
4. posterior urethral valves
5. congenital anomalies
6. post-radiation scarring
7. enlarged lymphatic glands
8. retroperitoneal fibrosis and lastly
9. prostate enlargement

Non-obstructive causes are

1. external trauma to the kidneys, the urinary collecting system, or injury during
2. pelvic
3. gynaecological
4. retroperitoneal and lastly
5. genitourinary surgery

Urinoma and all its causes are rare presentation.<sup>5</sup> Trauma to the urinary system is the most recognised cause in adults these days with advancement in radiology. Obstructive cause like ureteral calculi are less likely seen manifesting as urinoma. The mechanism by which urinoma is formed is pyelosinus backflow of urine, that can occur with intrapelvic pressures rise which is greater than 35 cm of H<sub>2</sub>O, with subsequent rupture of caliceal fornices. Urinomas forming due to obstruction from

ureteral calculi are very rare. Calculi causes rise in intrapelvic pressures, pyelosis backflow, and subsequent rupture of caliceal fornices, which result in extravasation of urine.<sup>5</sup> Subcapsular urinomas consist of urine in between the kidney's parenchyma and capsule whereas perirenal urinomas consist of a urine collection in between Gerota's fascia and the capsule.<sup>6</sup> Most commonly, urine leaks into the subcapsular space or into the perirenal space within Gerota's fascia with extensive extravasation, urine may cross the midline, travel inferiorly, superiorly, or through lymphatic vessels.<sup>6</sup> If it extends inferiorly, it travels along the iliopsoas compartment below the inguinal ligament to the soft tissues of the thighs, pelvis, buttocks, or scrotum or into the peritoneum. There are few reports in the literature with stone-related urinomas.<sup>7</sup> The typical presentation of a patient with a stone-associated urinoma resembles that of a ureteral stone itself. Most patients complain of nausea, vomiting, and flank pain. Other symptoms include urgency, fever, ileus, and pain in the abdomen and genitals. Fluid analysis shows a significantly higher creatinine level and a lower glucose concentration relative to the serum. Urinalysis can show hematuria and pyuria.<sup>2</sup> The initial evaluation of a patient suspected of having an urinoma includes renal ultrasonography, followed by a CT KUB without contrast. The CT is the gold standard as it is able to demonstrate the relationship between the urinoma and the kidney, the ureter, and the fascial planes much better than ultrasonography.<sup>8</sup> The initial management of an urinoma is conservative. If the size of the urinoma does not decrease with conservative management after few days, then the patient needs an intervention. Initially, a percutaneous catheter under CT or ultrasound guidance can be placed in the most gravity dependent portion of the urinoma, and the output can be monitored. A sample of the fluid should be cultured and the patient should begin empiric antimicrobial therapy until culture results are available. If there is decrease in output or negligible output then the catheter should be removed and followed up with ultrasound to ensure complete resolution. If the drain amount does not decrease, or if it increases, further intervention has to be done. Persistent fluid drain indicates a continuous leak from the collecting system. Placement of an antegrade nephrostomy with or without a ureteral stent or a nephroureterostomy catheter has to be placed.<sup>9,10</sup> In our patient; he had percutaneous catheter drainage and ureteroscopy, stone removal, and stent placement done with complete resolution of his urinoma 1 week later.

## CONCLUSION

Urinomas if not detected in time can cause serious complications. Thus requiring immediate surgical management for its complete resolution if it is not responding to conservative line of management.

Urinoma complications include hydronephrosis, paralytic ileus, electrolyte imbalances, abscess formation, and sepsis. So the clinician/ surgeons should keep urinoma as a differential for ureteral calculi even though this is rare but serious entity that need prompt diagnosis and management of this condition.

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## REFERENCES

1. Puri A, Bajpai M, Gupta AK. Bilateral spontaneous perinephric urinomas: Case report and review of the literature. *Urology* 2004;(590):30-2.
2. Patil KK, Wilcox DT, Samuel M, Duffy PG, Ransley PG, Gonzalez R. Management of urinary extravasation in 18 boys with posterior urethral valves. *J Urol.* 2003;169(4):1508-11.
3. Heikkila J, Takinen S, Rintala R. Urinomas associated with posterior urethral valves. *J Urol.* 2008.
4. Wells JM, et al. Urinomas protect renal function in posterior urethral valves—a population based study. *Journal of Paediatric Surgery.* 45(2):407-10.
5. Titton RL, Gervais DA, Hahn PF, Harisinghani MG, Arellano RS, Mueller PR. Urine leaks and Urinomas: Diagnosis and Imaging-Guided Intervention. *Radio Graphics.* 2003;(23):1133-47.
6. Brenner and Rector's *The Kidney*, 8th ed. 2008, Saunders Elsevier. Volume 2, Section VI, Chapter 41. 180(4):1476-8.
7. Gayer G, Zissin R, Apter S, et al. Urinomas caused by ureteral injuries: CT appearance. *Abdom Imaging.* 2002;27:88-92.
8. Ghali AM, El Malik EM, Ibrahim AI, Ismail G, Rashid M. Ureteric injuries: diagnosis, management and outcome. *J Trauma.* 1999;46:150-8.
9. McAninch JW, Santucci RA. Genitourinary trauma. In: Walsh PC, eds. *Campbell's Urology.* Philadelphia, Pa: Saunders, 2002;3721-3727.
10. Behzad-Noori, Mandy, et al. Urinoma: A Rare Complication from Being between a Rock and Soft Organ. *EPCMS.* 2010;33(6):5-6.

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