

Acute Kidney Injury secondary to bilateral obstructing ureteric stones



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Abstract

Kidney stone disease is a common medical problem with a rising prevalence in the past few years. Kidney stones can rarely cause urinary tract obstruction and subsequent acute kidney injury (AKI), which is a urologic emergency. In this case report, we present a patient with AKI due to bilateral obstructing ureteric stones who underwent double J stents via ureterostomy leading to rapid recovery and kidney function restoration. Thus, considering kidney stone as a differential diagnosis and performing early investigations, particularly in acute onset anuria without typical symptoms of renal colic, would benefit patients.

Introduction

Kidney stone disease is a common medical problem with a rising prevalence from 8.7% in 2007 to 10.1% in 2016 in the United States [1]. Patients typically present with classic renal colic symptoms, including flank pain, hematuria, dysuria, urinary frequency, and urgency [2, 3]. Kidney stones can also cause urinary tract obstruction, leading to acute kidney injury (AKI). However, bilateral synchronous kidney stone resulted in obstructive uropathy, and AKI is uncommon and considered a urologic emergency [4, 5]. In this case report, we present a rare case of AKI due to bilateral obstructing ureteric stones.

Case presentation

- A 75-year-old man presented to the emergency department with a 4-day history of anuria, loss of appetite, and fatigue. He also experienced intermittent episodes of hematuria while oliguric for the past three weeks.
- His past medical history was significant for dyslipidemia, gout, renal colic due to distal ureteral stone treated by shock wave lithotripsy, atrial fibrillation, and pulmonary thromboembolism requiring anticoagulation with warfarin. He was obese with a BMI of 31.1 kg/m² and quit smoking and drinking in 1996.
- Upon examination, except for tachycardia (atrial flutter with rapid ventricular response on ECG), other findings were unremarkable.
- Initial Laboratory investigations revealed elevated serum creatinine (20.3 mg/dL) and BUN (174 mg/dL), mild leukocytosis (WBC 11.7 ×10³/μL, 86% neutrophil), hyponatremia (Na 129 mmol/L), hyperkalemia (K 7 mmol/L) and mild hypochloremia (Cl 95 mmol/L).
- Abdominopelvic CT scan without IV contrast (Figure 1) indicated bilateral obstructing stones with the size of 1.3 cm in the proximal right ureter and 1.5 cm in the proximal left ureter and a non-obstructing 5mm stone in left renal calculus. In addition to hyperkalemia management with insulin, dextrose, and calcium gluconate, he was admitted to the ICU as he required a higher level of care. Following urology consultation, two 4.8 French 26 cm double J stents were placed bilaterally. Subsequently, he became polyuric (7 L/day), and creatinine and BUN decreased within 72 hours to 2 mg/dL and 36 mg/dL, respectively.

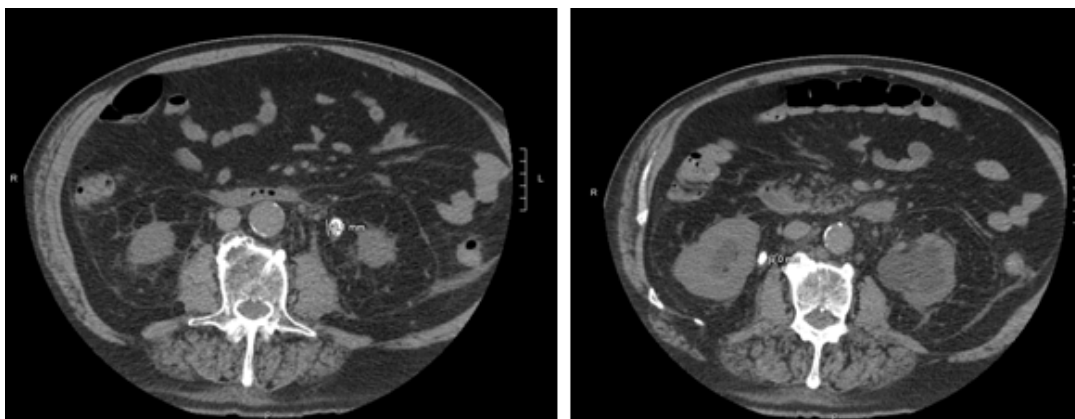


Figure 1. CT scan showing bilateral ureteral stones

Discussion

AKI secondary to kidney stone is rare and associated with bigger stone sizes, a history of solitary functioning kidney, or bilateral ureteral stones [6]. Furthermore, stones in the upper ureter can significantly contribute to AKI, similar to our patient's stones [6].

Since bilateral kidney stones can be life-threatening by causing outflow obstruction, AKI, and acid-base abnormalities, it is reasonable to consider an unenhanced abdominopelvic CT scan to rule out kidney stones when bilateral hydronephrosis is present in bedside ultrasonographic examination. This could lead to interventions resulting in the recovery of kidney function [2].

In previous studies, patients with bilateral ureteral stones underwent either bilateral percutaneous nephrostomies or double J stents via ureterostomy [4, 5]. The latter approach was performed for our patient, leading to full recovery and kidney function restoration.

Although bilateral synchronous ureteral stones have been shown uncommon, a definite number of cases with bilateral stones might be underestimated since some stones could be undiagnosed or pass spontaneously without further complications [5].

Conclusion

In this case report, we presented a patient with AKI due to bilateral obstructing ureteric stones who underwent double J stents via ureterostomy leading to rapid recovery and kidney function restoration. Thus, considering kidney stone as a differential diagnosis and performing early investigations, particularly in acute onset anuria without typical symptoms of renal colic, would benefit patients.

References

1. Chewcharat, A. and G. Curhan, *Trends in the prevalence of kidney stones in the United States from 2007 to 2016*. *Urolithiasis*, 2021. 49(1): p. 27-39.
2. Teichman, J.M.H., *Acute Renal Colic from Ureteral Calculus*. *New England Journal of Medicine*, 2004. 350(7): p. 684-693.
3. BOVE, P., et al., *REEXAMINING THE VALUE OF HEMATURIA TESTING IN PATIENTS WITH ACUTE FLANK PAIN*. *Journal of Urology*, 1999. 162(3 Part 1): p. 685-687.
4. Sumner, D., L. Rehnberg, and A. Kler, *Bilateral ureteric stones: an unusual cause of acute kidney injury*. *BMJ Case Reports*, 2016. 2016: p. bcr2016214683.
5. Alonso, J.V., et al., *Bilateral stones as a cause of acute renal failure in the emergency department*. *World J Emerg Med*, 2014. 5(1): p. 67-71.
6. Wang, S.J., et al., *The incidence and clinical features of acute kidney injury secondary to ureteral calculi*. *Urol Res*, 2012. 40(4): p. 345-8.



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