VI Edition of the Clinical Cases Contest on

non-surgical clinical management of Kidney Stones

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Title: Combined Management of Bilateral Ureteropelvic Junction Lithiasis: A Case Report

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1. Abstract.

Objective: To describe the sequential surgical and medical management of bilateral ureteropelvic junction lithiasis and to evaluate the preventive role of Lit-Control® pH Up in a high-risk patient.

Methods: A 47-year-old man was referred in September 2022 for bilateral lithiasis: a 3 cm right and a 15 mm left stone, both with densities around 400 HU. After initial drainage with bilateral double J stents, right percutaneous renal surgery (CRP) was performed in September 2023 without complications. Left ureteroscopy was attempted but not completed due to inflammatory polypoid lesions. Alkalinization therapy with potassium citrate was initiated, later switched to Lit-Control® pH Up for maintenance.

Results: Follow-up CT demonstrated complete stone clearance, urinary pH of 7.5, and stable renal function. No recurrence or complications were observed at 18 months.

Conclusion: Sequential surgical and metabolic management, including urinary alkalinization with Lit-Control®, may prevent recurrence and preserve renal function in complex bilateral lithiasis.

2. Introduction.

Renal lithiasis is a prevalent condition with an increasing global incidence, influenced by metabolic, anatomical, and environmental factors. Management strategies must be tailored according to stone size, location, density, and the patient's clinical status [1]. Bilateral lithiasis, particularly when associated with infection or obstruction, poses an additional challenge, often requiring staged or combined approaches to preserve renal function [2].

Recent updates to the European Association of Urology (EAU) guidelines emphasize the importance of individualized treatment planning, integrating both surgical and metabolic management [1]. In addition, metabolic evaluation and preventive medical therapy play a key role in reducing recurrence and improving long-term outcomes [3].

This case illustrates the sequential surgical and medical management of bilateral ureteropelvic junction lithiasis, highlighting the utility of percutaneous renal surgery and urinary alkalinization therapy in achieving complete clearance and preventing recurrence.

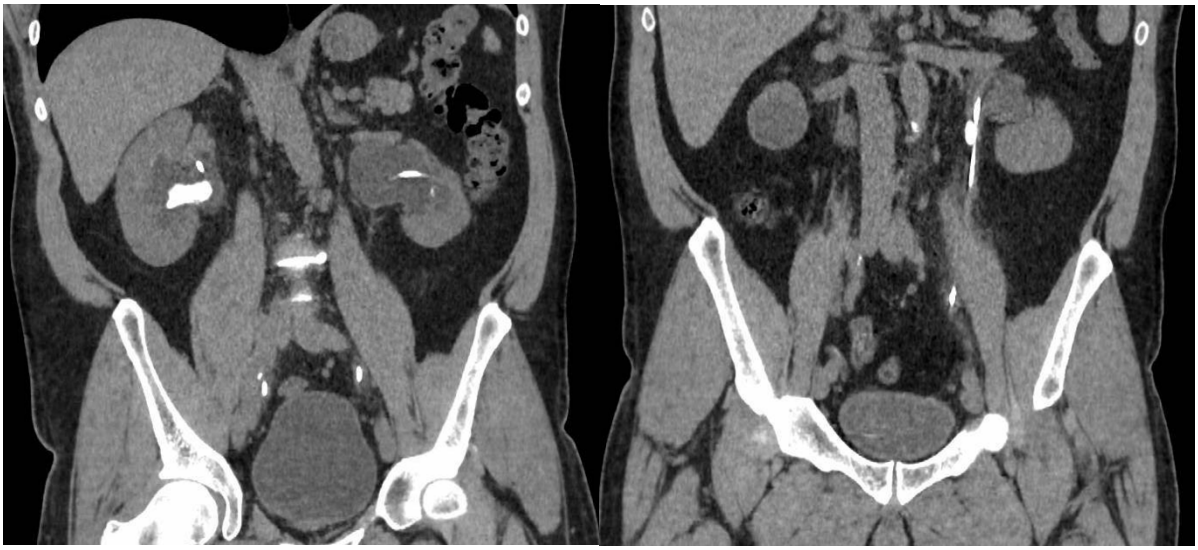
3. Clinical Case description.

a. Patient information / Medical records

A 47-year-old man was referred to our Urology Department in September 2022 for evaluation of bilateral lithiasis located at the ureteropelvic junction. Computed tomography (CT) revealed a 3-centimeter right pelvic stone and a 15-millimetre left pelvic stone, both with densities around 400 HU. At the time of referral, the patient carried a left double J stent placed after an episode of pyelonephritis. A control CT scan showed grade II right hydronephrosis, and a right double J stent was therefore inserted for drainage. The patient had no significant comorbidities or allergies.

b. Diagnostic support studies and results

- Initial imaging: CT scan showing bilateral pelvic stones (3 cm right, 15 mm left, both ~400 HU).



- Renal function: Normal at baseline (serum creatinine 1.0 mg/dL).
- During postoperative period: Acute kidney injury with peak creatinine 4.4 mg/dL, which normalized during follow-up.
- Metabolic evaluation: Hyperuricemia detected during follow-up; urinary pH 7.5 after alkalinization.
- Stone composition: Not analyzed, but uric acid–predominant composition suspected based on density and therapeutic response.
- Final imaging: CT scan shows stone-free kidneys.

c. Diagnosis

Bilateral ureteropelvic junction lithiasis complicated by prior pyelonephritis and postoperative acute kidney injury, in a patient with metabolic predisposition (hyperuricemia).

d. Treatment

In September 2023, elective surgical treatment was performed. A right percutaneous renal surgery (CRP) was carried out without intraoperative complications, achieving complete clearance of the right renal stone. During the same session, an attempt at left ureteroscopy was made, but progression beyond the pelvic ureter was impossible due to multiple inflammatory and infectious polypoid lesions from the ureteral meatus to the mid-ureter.

A 6/26 Ch ureteral stent was placed, and a percutaneous nephrostomy was inserted by the interventional radiology team due to postoperative acute renal impairment (Cr 4.4 mg/dL).

e. Evolution and progress

In October 2023, both double J stents were removed, maintaining the left nephrostomy. The nephrostomy accidentally dislodged in January 2024. A follow-up CT scan after initiation of urinary alkalinization with potassium citrate showed complete resolution of the lithiasis, with no residual stones and urinary pH of 7.5. Hyperuricemia was confirmed during follow-up.

f. Clinical results

The patient continued treatment with potassium citrate (2 tablets every 8 hours) and remained asymptomatic. Follow-up visits in August and November 2024 showed normal renal function and no new lithiasis. In March 2025, as the patient remained stone-free, maintenance therapy with Lit-Control® pH Up was initiated. The patient continues under periodic follow-up without recurrence or complications.

4. Discussion.

Bilateral renal lithiasis remains a therapeutic challenge, particularly when infection, obstruction, or impaired renal function coexist. Management must be individualized according to stone size, location, and density, as well as patient comorbidities and renal status [1]. In this case, both stones were located at the ureteropelvic junction, with a low density of around 400 HU, suggesting a uric acid–predominant composition. The presence of prior pyelonephritis and postoperative acute kidney injury required a cautious, staged approach combining endourologic and metabolic management.

Percutaneous renal surgery (CRP) remains the gold-standard treatment for large (>20 mm) renal stones, allowing high clearance rates with minimal morbidity [2]. In this patient, right-sided CRP successfully achieved complete stone removal, while the left side could not be treated endoscopically due to inflammatory–infectious ureteral lesions. Once renal function stabilized, medical management was prioritized to dissolve or prevent recurrence of uric acid stones.

Urinary alkalinization is a cornerstone of conservative management in uric acid or mixed stones, as solubility of uric acid increases sharply when urinary pH is maintained above 6.5 [3]. The use of alkalinizing agents such as potassium citrate and later Lit-Control® pH Up achieved sustained urinary alkalinization (pH 7.5), resolution of stones, and prevention of recurrence. Additionally, metabolic evaluation revealing hyperuricemia supports the hypothesis of uric acid lithiasis.

This case highlights the importance of combining surgical and metabolic approaches in patients with bilateral stones and functional renal impairment. Once the infection was controlled and renal drainage restored, staged management allowed both renal units to recover function while avoiding overtreatment. Regular follow-up and adherence to alkalinization therapy are essential to maintain stone-free status and prevent chronic kidney damage.

5. Conclusions and recommendations.

This case illustrates the effectiveness of a sequential and individualized approach in the management of bilateral ureteropelvic junction lithiasis. Surgical clearance through percutaneous renal surgery ensured complete removal of the large right-sided stone, while conservative metabolic therapy achieved resolution of the contralateral stone and prevented recurrence.

Urinary alkalinization with agents such as potassium citrate and Lit-Control® pH Up proved to be a safe and effective strategy in patients with suspected uric acid lithiasis, particularly when anatomical or inflammatory factors limit surgical intervention.

Early drainage and infection control remain essential steps in preventing renal function deterioration. Continuous metabolic follow-up, urinary pH monitoring, and adherence to preventive therapy are key to maintaining long-term stone-free status and preserving renal function.

6. Bibliographic references.

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