VI Edition of the Clinical Cases Contest on

non-surgical clinical management of Kidney Stones

Official template

Title: Time is your friend – chemodissolution of coralliform stone using Lit-Control® pH Up

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Key words (3 to 6): uric acid lithiasis, urinary alkalinisation, Lit-Control® pH Up

1. Abstract (no longer than 150 words).

Introduction: Uric acid nephrolithiasis represents a significant subset of urinary stones. While large renal calculi are typically managed with percutaneous nephrolithotomy (PCNL), uric acid stones are unique in that they can be dissolved through urinary alkalinization.

Methods: We report the case of a 62-year-old male with a history of uric acid lithiasis who presented with a right sided coraliform stone. Initial evaluation showed hyperuricemia, low urinary pH, and a radiolucent calculus on imaging.

Outcome: The patient was managed conservatively with febuxostat and urinary alkalinization therapy (Lit-Control® pH Up), alongside increased fluid intake. After three months, follow-up imaging revealed complete dissolution of the calculus, normalization of serum uric acid, and elevation of urinary pH to alkaline levels.

Conclusion: This case highlights the efficacy and safety of medical dissolution therapy for large uric acid stones, potentially avoiding invasive surgical procedures and their associated risks.

2. Introduction

Uric acid stones are one of the main stone types. Their prevalence differs among populations—8–10% in the United States and up to 28% in Pakistan. Although genetics contribute, reduced fluid intake, a Western diet and metabolic syndrome are major risk factors, mainly because eating more red meat increases purine intake, which are metabolised into uric acid. Moreover, a low urinary pH is a prerequisite for its formation. [1]

Although the European Association of Urology (EAU) guidelines maintain percutaneous nephrolithotomy (PCNL) as the mainstay for treatment of renal stones >20mm, [2] an asterisk should be made for uric acid stones, as these can be dissolved by urinary alkalinization. [3] Since uric acid precipitates at a pH of 5,5, a requirement for the stone's formation and growth, if urinary pH is elevated (alkalinization), uric acid is shifted to its soluble

state. This allows, over time, for the stone to be dissolved and eventually for the patient to achieve stone-free status. [1,3]

3. Clinical Case description

a. Patient information / Medical records

We present a 62 year-old male patient with a past medical history of obstructive pyelonephritis in 2017 due to a 6mm lower left ureter stone, which was urgently derived with a double J stent, and followed up with a ureteroscopy with laser fragmentation. At the time the stone analysis showed a uric acid composition. He was referred to our Urology department during follow-up due to a new coralliform stone in the right kidney.

b. Diagnostic support studies and results

Blood chemistry: Creatinine 1,51 mg/dL, Uric acid 10,5 mg/dL, Urinary pH 5,0

KUB X-Ray: no stone visualization

CT scan (25/08/2024): Large coraliform calculus in the right renal sinus (340 HU) with mild associated pyelo-calyceal ectasia, filling the renal pelvis and calyces and extending to the ureteropelvic junction, with slight densification due to surrounding edema, measuring approximately 4 cm in diameter (Figure 1, Figure 2).

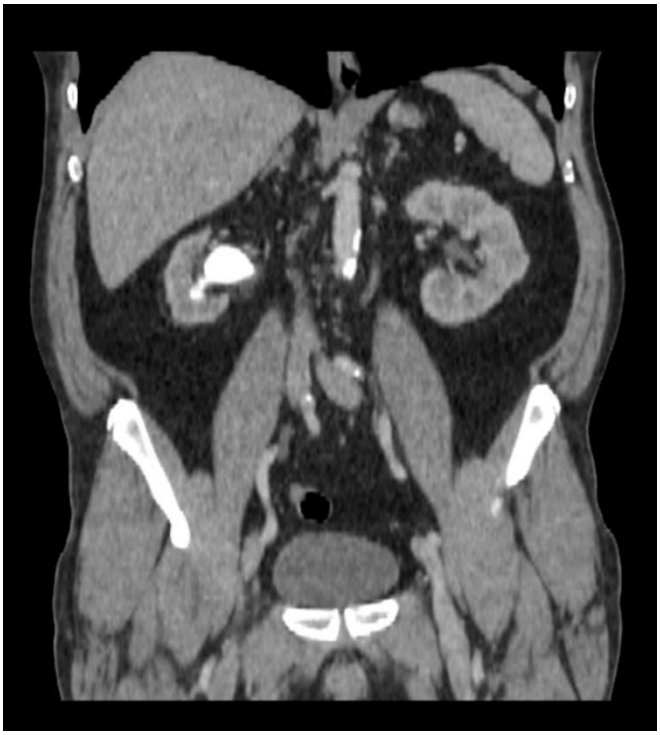

Figure 1 - simple coronal CT scan showing coralliform stone

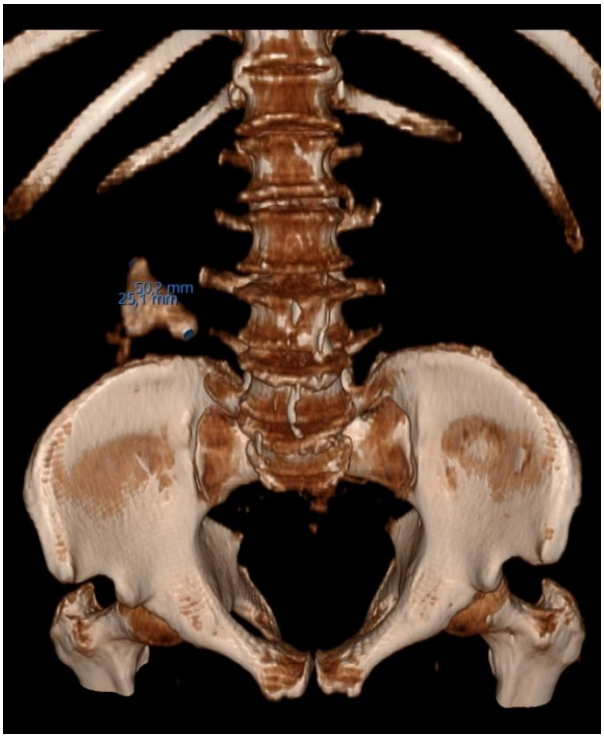

Figure 2 - CT scan reconstruction showing stone size

c. Diagnosis

Given the previous history of uric acid stones, low urinary pH, high uric acid in the blood and a radiolucent stone at X-ray, a presumptive diagnoses of uric acid stone was made.

d. Treatment

The patient was started on Lit-Control® pH Up 1 tablet every 12 hours and febuxostat 80mg once daily and recommended to an adequate fluid intake of at least 2,5 L/ day.

e. Evolution and progress

The patient was followed up at 3 months with CT scan, blood sample and a urine test.

f. Clinical results

The CT scan at 3 months showed a complete disappearance of the stone, with a correct adherence to the prescribed therapy (Figure 3, Figure 4). The blood serum uric acid concentration normalized (4,6 mg/dL) and the urinary pH rose to 7,0.

Figure 3 - simple coronal CT scan 3 months after treatment initiation

Figure 4 - simple sagital CT scan 3 months after treatment initiation

4. Discussion

Lithiasis is one of the most common Urological problems in the general population, and the correct approach to each patient is imperative. PCNL is an option for a quick solution for the problem. However, it carries several severe risks, mainly bleeding, septic chock or development of a arteriovenous fistula, which will result in prolonged hospital stays, costs, and ultimately worse outcomes for the patient. [4]

Currently, the medical treatment of lithiasis is an ever-growing discussion topic, as it can reduce or even completely omit intervention in some patients. In this case, it was possible to achieve a stone-free status without the need for an intervention, which reduced the overall comorbidity, as the medication was well tolerated and adhered to.

5. Conclusions and recommendations

This case demonstrates that urinary alkalinization combined with xanthine oxidase inhibition can be an effective, safe, and non-invasive alternative for treating even large uric acid renal stones. Proper patient selection, adherence to therapy, and close biochemical and imaging follow-up are essential for success. Medical management should always be considered in cases with clear evidence of uric acid composition and favorable metabolic parameters before proceeding to surgical intervention.

6. Bibliographic references (* of special interest, ** of extraordinary interest)

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