VI Edition of the Clinical Cases Contest on

non-surgical clinical management of Kidney Stones

Sulfadiazine-Induced Multiple Bilateral Urolithiasis and Acute Renal Failure: A Rare Drug-Induced Complication and the role of Lit-Control® pH-up

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Abstract

Objective: To report a complex case of bilateral sulfadiazine-induced urolithiasis leading to acute renal failure.

Method: Clinical records and literature on sulfadiazine-induced nephrolithiasis were reviewed. **Results:** A 50-year-old female with previously undiagnosed HIV presented with CNS toxoplasmosis and received a four-week course of pyrimethamine and sulfadiazine. She developed acute renal failure (creatinine 1.06 → 8.33 mg/dL). CT scan revealed multiple stones: left ureteropelvic junction 12 mm, left renal pelvis 10 mm, right ureter 8 mm, plus small bladder calculi. Bilateral double-J stents were placed. Hydration and urinary alkalization with Lit-Control® pH-up were initiated. Follow-up CT scan showed no ureteral stones, kidneys clear apart from a 4 mm right renal calculus, and resolution of bladder stones.

Conclusions: Sulfadiazine-induced nephrolithiasis can cause life-threatening obstruction. Early recognition, urinary diversion, and alkalization are crucial, and Lit-Control® may facilitate stone dissolution and prevent recurrence.

Keywords: Drug-induced nephrolithiasis; Sulfadiazine; Acute renal failure; Urinary alkalization; Lit-Control®

Introduction

Drug-induced urolithiasis is a rare cause of renal calculi, accounting for 1–2% of cases. Sulfonamides, especially sulfadiazine, are historically recognized for inducing stones, with peak incidence in the 1990s. Currently, sulfadiazine is mainly used to treat toxoplasmosis in immunocompromised patients, rendering associated nephrolithiasis uncommon. Severe acute renal failure as a consequence of drug-induced stones is even rarer. This report illustrates a complex bilateral case, highlighting diagnosis, management and the adjunctive role of urinary alkalization with Lit-Control®.

Clinical Case Description

A 50-year-old female presented to the emergency department with neurological disturbances that had developed over several weeks. Diagnostic evaluation revealed central nervous system toxoplasmosis in the context of previously undiagnosed HIV infection, at an advanced AIDS stage. She was treated with a four-week course of pyrimethamine and sulfadiazine. At the conclusion of this treatment, she experienced a sudden deterioration in renal function, with creatinine rising from 1.06 mg/dL to 8.33 mg/dL within one week. An abdominopelvic CT scan revealed multiple stones bilaterally: a 11 mm calculus at the right ureteropelvic junction and an 8 mm stone in the left ureter, along with several small stones in the bladder. Notably, a CT scan performed three months prior had shown no evidence of urolithiasis.

Given the severity of her acute renal failure due to post-renal obstruction, the patient underwent urgent placement of bilateral double-J ureteral stents, without complications. Following urinary diversion, her renal function began to improve. To facilitate further stone dissolution and prevent recurrence, she received aggressive hydration and urinary alkalization using Lit-Control® pH-up. On follow-up imaging, the ureteral stones had resolved, the kidneys were largely clear, apart from a small 4 mm calculus in the right kidney, and the bladder stones were no longer present. Clinically, she remained asymptomatic with stable renal function during outpatient follow-up. This case demonstrates the life-threatening potential of sulfadiazine-induced nephrolithiasis and highlights the effectiveness of timely urinary diversion combined with alkalization therapy in promoting stone resolution and preserving renal function.

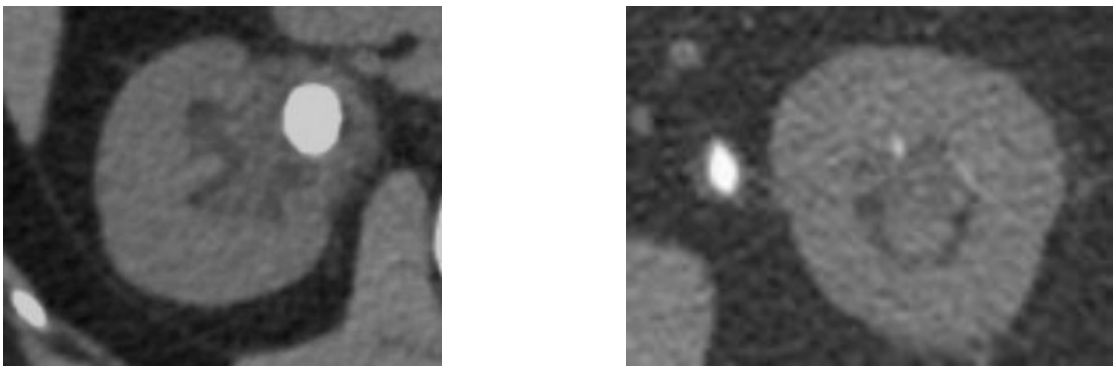

Figure 1 – CT scan revealing multiple stones causing bilateral ureterohydronephrosis and acute kidney failure. The stones show low attenuation (low HU values).

Discussion

Sulfadiazine-induced nephrolithiasis results from urinary excretion of the drug and poor solubility of N-acetylsulfadiazine, forming needle-shaped crystals that aggregate into calculi. Stones typically have low Hounsfield Units (<250) and can cause obstruction, especially in acidic urine. Management includes hydration and alkalization, which promote crystal dissolution. Urgent urinary diversion is indicated in obstructive cases. This case demonstrates the life-threatening potential of drug-induced stones and supports the use of Lit-Control® as an adjunct for urinary alkalization and stone resolution.

Conclusions and Recommendations

In conclusion, Sulfadiazine-induced nephrolithiasis can precipitate acute renal failure, particularly in complex bilateral cases. Early recognition, urinary diversion, hydration, and alkalization are essential. Adjunctive therapies such as Lit-Control® pH-up may enhance stone dissolution and prevent recurrence.

Bibliographic references

Ben Salem, C., Slim, R., Fathallah, N., & Hmouda, H. (2016). Drug-induced kidney stones and crystalline nephropathy: Pathophysiology, prevention and management. British Journal of Clinical Pharmacology, 82(5), 1032–1042.

Duran, P. A., et al. (1999). Sulfadiazine-induced nephrolithiasis in AIDS patients treated for toxoplasmosis. Clinical Infectious Diseases, 29(4), 928–932.

*Fogazzi, G. B., Garigali, G., & Messa, P. (2016). Drug-induced nephrolithiasis and crystalluria: A review of the literature and a practical approach to diagnosis and management. Clinical Kidney Journal, 9(4), 516–522.

**Prieto, J. C., et al. (2021). Efficacy of a novel dietary supplement (Lit-Control® pH Up) in urinary alkalinization: Results from a prospective observational study. Urolithiasis, 49(6), 527–534. **