

2nd Edition of the Contest of Clinical Cases related to the non-surgical clinical management of kidney stones

Title: Lit-Control pH Up as a great alternative for uric acid stones.

Keywords: Lithiasis, uric acid, alkalizing, Lit-Control pH Up, theobromine.

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1. Summary

We report the case of a 71-year-old obese woman diagnosed with bilateral uric acid lithiasis who required urgent urinary referral, after which alkalinising treatment with Acalca® was prescribed without benefit. The patient had to undergo percutaneous nephrolithotomy, a procedure which failed to remove all the kidney stones. After this, the patient was treated with Lit-Control® pH Up, achieving almost a total resolution of her kidney stones.

2. Introduction

Uric acid kidney stones correspond to a frequent pathology in our clinical practice. Management through hygienic-dietary measures, as well as urinary alkalization with citrate and/or bicarbonate are proving to be an effective approach to this type of stones. We present one of our cases in which we observed almost complete resolution of bilateral uric acid kidney stones.

3. Description of the clinical case

A 71-year-old woman with a clinical history of arterial hypertension, obesity and dyslipidemia with a BMI of 43. The patient came to the emergency department in fair general condition, afebrile, without voiding syndrome or haematuria; she only reported pain in the left flank and decreased diuresis.

Given the diagnosis of suspected renal colic, an abdominal X-ray was requested, but no radiopaque stone was observed. Given the high suspicion of renoureteral colic and the patient's worsening symptoms, it was decided to request a CT scan.

Analytically there was no alteration. A urinary pH of 5.5 is observed, with the rest of the parameters in the range of normality.

In CT, large bilateral kidney stone is observed, with an obstructive left kidney stone. (Figures 1, 2, 3, 4, 5 and 6). The kidney stone had a measurement of 23.6 mm with 528.33 HU.

In view of these findings, urgent urinary diversion via double J stent was decided and empirical alkalinising treatment with potassium citrate (Acalka[®]) 1 pill (10 mEq) every 8 hours (30 minutes after meals) was started without urinary pH control.

After 3 months, in a review appointment, with an ultrasound imaging test, good cortico-medullary differentiation was observed, with no dilation of the urinary tract and persistence of the stone with a similar size to the CT scan prior to the start of treatment with Acalka[®]. An abdominal X-ray was performed, confirming the normal position of the double J stent. As the size of the kidney stone had not decreased despite medical treatment, percutaneous nephrolithotomy was decided upon as a therapeutic option.

At the time of the renal puncture, purulent urine was observed, so the procedure was suspended, and a decision was made to perform a urinary diversion with left percutaneous nephrostomy. One week after the procedure, the patient returned to the emergency department for general malaise associated with fever and decreased diuresis due to nephrostomy. The nephrostomy was found to be poorly positioned, so it was decided to reintervene the patient and the puncture of a new nephrostomy was unsuccessful, so a double J stent was placed (Figures 7 and 8).

One month later and under antibiotic prophylaxis, percutaneous lithofragmentation of left kidney stone was performed. The postoperative control CT scan showed remaining kidney stone in the lower calyx of the left kidney and a kidney stone in the right kidney, which had increased in size compared to the initial CT scan (Figures 9 and 10).

Analysis of the extracted kidney stone: Anhydrous uric acid (85%) and dihydrated uric acid (15%).

With the above results and in consultation with the kidney stones unit, alkalinising treatment was decided together with medical dietary guidelines and home control of urinary pH.

Alkalizing treatment: Lit-Control[®] pH Up 1 every 12 hours and urinary pH control 3 times a day by using Lit-Control[®] pH Meter. If a pH under 6 was observed, rescue treatment with sodium bicarbonate is prescribed.

At 3 months, in a follow up clinical consultation, the patient reports good tolerance to treatment. It has an urinary pH around 6, requiring in 50% of the days the use of bicarbonate as a rescue treatment.

Subsequent follow up CT scans showed the complete disappearance of the kidney stone in the left kidney and a progressive decrease in the size of the stone in the right kidney, which is why it was decided to continue with the prescribed treatment (Figures 11, 12 and 13).

Currently, the patient is asymptomatic, with good general condition and good tolerance to the alkalinising treatment, pending a new CT scan to assess the completion of this treatment.

EXAMINATION AND COMPLEMENTARY TESTS



Figure 1

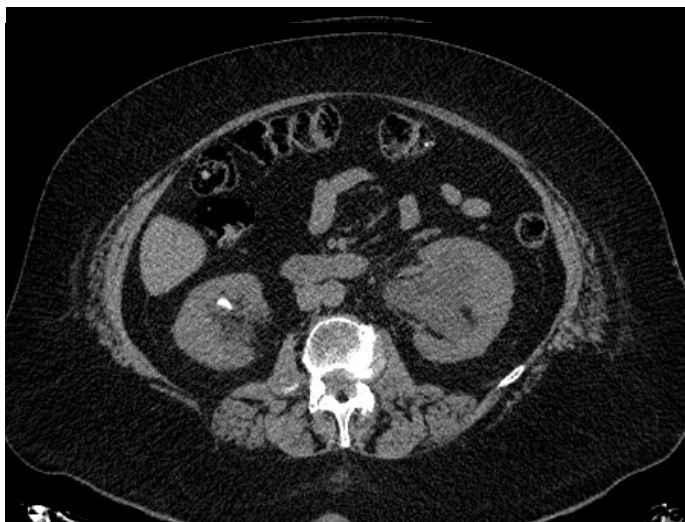


Figure 2



Figure 3

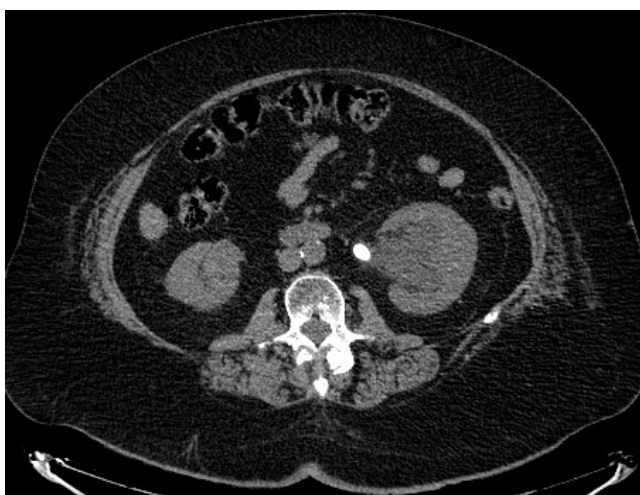


Figure 4



Figure 5

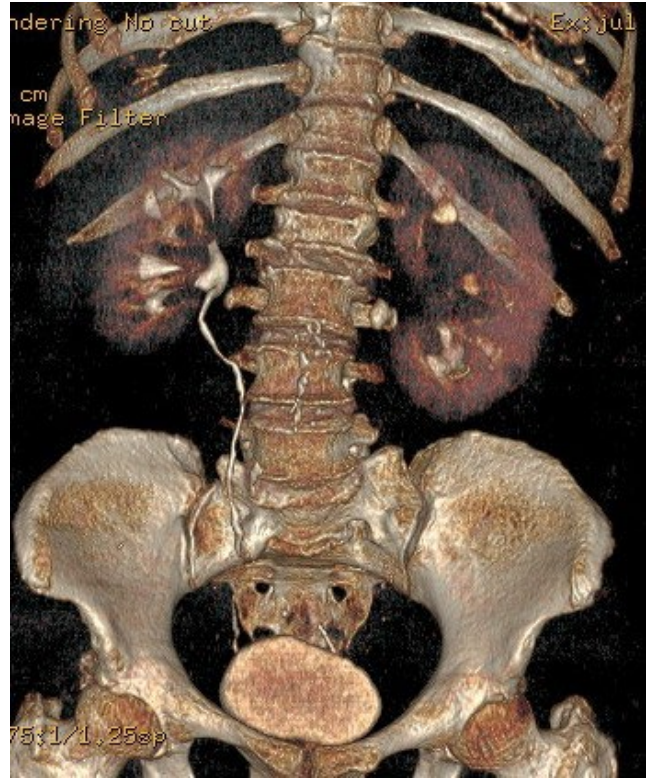


Figure 6



Figure 7



Figure 8

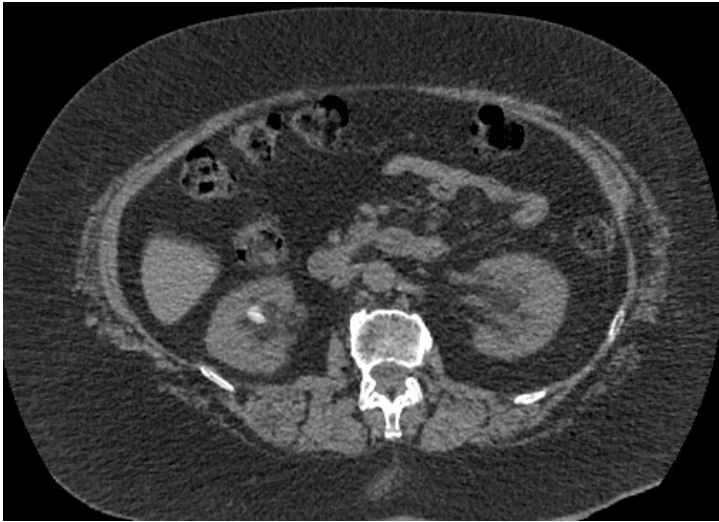


Figure 9



Figure 10



Figure 11



Figure 12



Figure 13

4. Discussion

Kidney stone disease has a multifactorial origin and may be associated with other pathological entities. The high prevalence of this disease (14.6% in people between 40 and 65 years of age in Spain), its high recurrence rate (52.8%) and the risk of developing secondary kidney disease, make an individualized study and follow up necessary to prevent its development (1).

The characteristics of the removed kidney stone and the presence of an underlying systemic pathology are essential to determine the risk of lithiasis recurrence. (2).

A basic metabolic study by blood and urine analysis should be performed in all patients with an episode of kidney stones. In the case of high-risk patients (see Table 1), a specific or expanded metabolic study with more plasma parameters and with collection of two urine samples in 24h is required (3,4).

General risk factors: Early onset of stone disease; Family clinical history of kidney stone disease; Recurrent lithiasis; Early recurrence; Brushite stones; Uric acid stones; Infective stones; Single kidney
Diseases associated with the formation of calculi: Hyperparathyroidism; Metabolic syndrome; Nephrocalcinosis; Polycystic kidney disease; Gastrointestinal diseases; Elevation of vitamin D; Sarcoidosis; Spinal cord injury; Neurogenic bladder
Genetic diseases associated with the formation of kidney stones: Cystinuria (types A, B and AB); Primary hyperoxaluria; Renal tubular acidosis type I; 2,8-Dihydroxyadeninuria; Xantinuria; Lesch-Nyhan syndrome; Cystic fibrosis
Anatomical alterations: Renal medullary spongiosis; Dysfunction of the pyelo-ureteral junction; Calyceal diverticulum; calyceal cyst; Ureteral stenosis; Vesico-ureteral reflux; Horseshoe kidney; Ureterocele
Environmental and professional factors: High temperatures; Exposure to plumb and cadmium

Table 1 High risk factors for kidney stones recurrence. (4)

Uric acid stones accounts for 10% of kidney stones, with an increased incidence in diabetic and obese patients.

It is associated with hyperuricosuria and may be associated with hyperuricaemia, although it is true that its detection shows a weak association with the formation of kidney stones. However, the most important aetiological factor in the formation of this type of stones is a urinary pH below 5.5, the main therapeutic objective is to maintain urinary pH above 6.5, as recommended by the clinical guidelines of the European Association of Urology (5).

Lit-Control® pH Up contains potassium citrate, magnesium citrate and theobromine. Theobromine is a natural dimethylxanthine found in cocoa which inhibits the nucleation and formation of uric acid crystals (6). The combination of this substance with citrate is a promising alternative for the treatment of uric acid kidney stones compared to treatment with citrate alone, as it increases the solubility of acid crystals and promotes their excretion in the urine (7).

5. Conclusions and recommendations

The incidence of kidney stones disease is increasing in developed countries in part because of changes in lifestyle and eating habits. The high recurrence of kidney stones requires an individualized study depending on the characteristics of the patient and the kidney stone, as well as the different pathologies that may predispose to this disease.

The non-surgical management of uric acid kidney stones not only prevents recurrences, but also represents a safe and effective therapeutic option in its management, even in those cases with high lithiasis burden.

In addition, patients with high surgical risk or with factors that a priori may be contraindicated to surgery (such as significant obesity), may benefit from this type of treatment.

6. References

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