3rd Edition of the Clinical Cases Contest related to the non-surgical clinical management of renal lithiasis

Title: Pharmacological chemolysis of uric acid lithiasis in a patient with Crohn's disease

Keywords (between 3 and 6): *Crohn's disease. Chemolysis. Urinary pH. Uric acid. Lit-Control*

1. Summary (not over 150 words)

Clinical case report of a male patient with Crohn's disease and an ileostomy carrier, diagnosed with uric acid lithiasis after visiting the emergency room during an episode of left renal colic. After urinary alkalization using medications and dietary recommendations, the patient achieved a complete chemolysis; maintaining the stability of his underlying condition, without showing side effects throughout the treatment. After the lithiatic brake down, the patient remains asymptomatic and under follow-up through outpatient visits.

2. Introduction

Crohn's disease is a chronic inflammatory bowel disease (IBD) of unknown etiology associated to an altered immune response. The disease presents with periods of activity and remission and can affect any section of the intestinal tract from the mouth to the anus in a transmural and patched way. The treatment for Crohn's disease consists of tumor necrosis factor inhibitors for moderate or severe cases. Incidence increase makes it more and more frequent in the usual medical practice, therefore its metabolic alterations are of special interest.

On the other hand, it is known that patients with chronic diarrhea or those with ileostomies suffer from urinary disorders. In these cases, since the urinary elimination of citrate and magnesium is decreased and the excretion of calcium oxalate is increased, the crystallization of uric acid or calcium oxalate stones is favored. In addition, chronic diarrhea decreases urinary pH as a result of electrolytes loss in the gastrointestinal tract, notably favoring uric acid lithiasis. The latter can benefit from pharmacological treatments that alkalize urine, being digestive disorders the most significant side effect of this treatment.

Clinical case report of a male patient with personal history of Crohn's disease, ileostomy carrier on Infliximab diagnosed with uric acid lithiasis after left renal colic. In this case a complete chemolysis was achieved with medical treatment. There are not many published cases on the management of uric acid stones in patients with inflammatory bowel disease.

3. Description of the clinical case:

a. Relevant medical history

Clinical case report of a 54-year-old male patient with personal history of Crohn's disease diagnosed over 10 years ago on treatment with Infliximab, an ileostomy carrier after he underwent a total colectomy during an outbreak of his underlying disease. The condition is currently stable on medical treatment.

b. Diagnostic support studies and results

- Blood test: Creatinine 0.84 Calcium 9.2 Na 137 K 4.0 Leukocytes 8,000 CRP 4.1
- Normouricemia (5 mg/dl)
- Abdominal X-ray: no pathological findings (Image 1).
- Abdominal ultrasound: Grade II ureterohydronephrosis of the left kidney is observed, it also shows lithiasis in the renal pelvis. The distal cause of urinary tract dilation is not identified with this technique.

Image 1

Image 2

c. Diagnosis

The patient with the aforementioned medical history is evaluated in the emergency room for presenting pain in the left renal fossa radiated to the ipsilateral groin for the last six hours that does not subside despite being treated with analgesics at home. The patient denies fever, although he mentions presenting chronic diarrhea during the last few weeks without exacerbation. In the emergency room, the complementary aforementioned tests are performed, showing normouricemia, renal function within the normal range and the absence of high infectious parameters.

Based on the findings of the complementary tests, the patient is diagnosed with uncomplicated left renal colic with a high probability of uric acid lithiasis. The patient was discharged from the emergency room after receiving the following treatment. The patient was scheduled for outpatient visits within two weeks. At discharge, a 24-hour urinalysis and an abdominal-pelvic CT scan without contrast were requested, showing the following results:

- 24-hour urinalysis: Acidic pH (pH < 5) suggestive of hyperuricosuria.
- Abdominal-pelvic CT scan: Abdominal computed tomography without contrast: a 11mm lithiasis (550 Hounsefield units) is found in left pyeloureteral junction, without dilation of excretory tract, showing no signs that suggest acute pyelonephritis (Image 2).

In addition, the patient brings a lithiatic fragment passed during the renal colic episode. The suspicion of uric acid lithiasis is confirmed after performing an X-ray diffraction analysis to the passed fragment, which resulted in 70% uric acid and 30% dehydrated uric acid.

d. Treatment

To treat the renal colic at the emergency room, supportive treatment was administered with fluids associated with analgesic treatment, initially with paracetamol and non-gastric damaging NSAIDs (given the relative contraindication within the basal disease of the patient) achieving good analgesic control. Likewise, metoclopramide was administered to control nausea. Analgesic treatment was prescribed at discharge and 0.4mg/day of Tamsulosin was added as an expulsive treatment given the probability of another lithiasis existing in the ureteral track.

After confirming high suspicion of uric acid lithiasis treatment with chemolysis is initiated during outpatient consultation. Following the UAE guidelines, potassium and magnesium citrate (Lit- Control pH Up®) was chosen as the initial treatment at a dose of one tablet every 8 hours, along dietary and lifestyle measures (exercise, adequate water intake and dietary control). For better control and strict monitoring, the patient was offered the possibility of using myLit-Control App® which measures water intake, urinary pH and food supplements.

e. Progress and monitoring

After twelve months of well-controlled basal disease and therapeutic compliance, the urinary pH range of the patient remains within the chemolysis range, under strict vigilance to avoid pH levels over 7.2. During the successive follow-up visits, complete chemolitholysis with medical treatment was confirmed through imaging studies (Image 3).

The patient had no complications during the follow-up, referring adequate gastrointestinal tolerance to the treatment and denying side effects. He is currently being monitored by the urology outpatient clinic with preventive dose treatment (Lit - Control pH Up®) to maintain a pH within the non-acidic range. During the treatment and subsequent follow-up, the patient continues to use the app with satisfactory results.

Image 3

f. Clinical results

After one year of treatment the patient showed the following results in complementary tests:

- Blood test: Cr 0.92 Calcium 9.1 Na 136 K 4.2 Leukocytes 7,300 CRP 0.0
- Normouricemia (5,1 mg/dl)
- Urinalysis: Urinary pH 6.7.
- Computed tomography scan: renal lithiasis brake down (Image 3).

4. Discussion

IBD and specifically, Crohn's Disease[1], can affect any section of the intestinal tract by altering systemic and urinary metabolism due to gastrointestinal absorption damage. There been described cases of patients suffering from gastrointestinal disorders that also associate with concomitant urinary lithiasis. Given that there is an incidence increase of this type of disorders during the last few years and there are few described cases of urinary uric acid lithiasis in this type of patients, we consider interesting the presentation of this clinical case, which also provides a management option in selected patients.

Patients with chronic diarrhea or ileostomies carriers suffer from deficient urinary elimination of citrate and magnesium (hypocitraturia and hypomagnesuria)[2], as well as increased oxalate levels [3]. This condition favors the crystallization of kidney stones; generally being the ones formed from calcium oxalate the most described and studied due to their frequency[4]. Uric acid stones, on the other hand, account for 10-15% of all urinary stones. We must take into account that 30% of uric acid is passed through the gastrointestinal system and that is why GI disorders can increase the incidence of uric acid stones. In addition to a decrease in urinary volume, in patients with ileostomy or chronic diarrhea[6], which also favors the development of this type of lithiasis.

Another of the alterations that could favor this type of lithiasis in patients with IBD would be hyperuricosuria[7]. Although hyperuricosuria without hyperuricemia is rare, hyperuricosuria on its own is mainly related to dietary alterations such as increased intake of proteins, legumes or purine-rich vegetables. Patients with digestive conditions sometimes require strict dietary control that should also be considered for treatment.

For uric acid lithiasis that develop within renal anatomy with no obstruction or infection, the initial treatment consists of medications along with dietary and water intake measures. Since the formation of lithiasis is dependent of urinary pH, the volume of diuresis and the concentration of urates in the blood, these parameters should be monitored in order to plan treatment. In addition, the patient should be recommended specific dietary guidelines such as restriction of animal proteins or purines-rich vegetables. Those lithiasis smaller than 2 cm can be treated with medications[8], alkalizing the urine and achieving, in some cases, a complete chemolitholysis. In patients whose underlying disease may alter the absorption of medications or alter urinary metabolism, it also seems essential to maintain their underlying disease stable[9,10].

The compound chosen for our patient acts by increasing urinary pH and reducing the risk of crystallization, also presenting magnesium that correctsthe hypomangesuria that characterizes this type of patients. Sometimes one of the biggest issues during medical visits is the gastrointestinal tolerance to alkalizing treatments that sometimes forces to change doses or even the treatment but

in this case, the adequate tolerance and adherence to the treatment is emphasized. Probably the use of the app (myLit-Control App®) facilitated the monitoring and the correct treatment control.

Our patient remains stable and asymptomatic, achieving complete chemolitholysis with medical treatment exclusively, which was well-tolerated while also maintaining stable his underlying disease.

5. Conclusions and recommendations

Crohn's disease is an increasingly incident pathology in our environment, so we must be aware of the gastrointestinal, metabolic and renal excretion alterations that these patients may undergo. These alterations can favor the development of urinary tract lithiasis. Specifically, uric acid lithiasis, after the diagnosis is confirmed through laboratory and imaging tests, it can be managed conservatively in selected patients. Medical treatment without invasive procedures from the start is indicated. It is an important option to consider for these patients, who in many cases have complex management and in which it is essential to start with the least aggressive treatments possible.

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

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