1st edition of the competition of clinical cases related to the non-surgical clinical management of renal lithiasis

Title: INCRUSTANT PIELITIS IN MALE URINARY DIVERTED BRICKER TYPE URETERAL CATHETER CARRIER.

Keywords: encrusting pyelitis, Corynebacterium Urealyticum, Lit-Control pH Down®

1. Summary

OBJECTIVE: encrusting pyelitis is an infection caused by Corynebacterium Urealyticum whose incidence is increasing in immunocompromised patients and in carriers of indwelling catheters.

METHODS: We present the case of a 72-year-old male with Bricker type urinary diversion and JJ catheter. Subsequently, calcification of the catheter was observed with CT images suggestive of encrusting pyelitis and positive urine cultures for Corynebacterium Urealyticum. Endoscopic and medical treatment was combined with anti-biotherapy and urine acidification, through nephrostomy with irrigation solution and orally with Lit pH-down control, to avoid new infections.

RESULTS: the treatment was effective, with absence of reinfections thanks to the maintenance treatment with Control Lit pH-down.

CONCLUSIONS: diagnostic suspicion and early treatment of encrusting pyelitis avoid associated complications. Anti-biotherapy associated with urine acidification are the basic pillars of treatment.

2. Introduction

Fouling pyelitis (FP) is a urinary tract infection caused by the bacterium Corynebacterium urealyticum (previously called group D2), in which struvite crystals become encrusted on the pyelocaliceal mucosa and may extend into the ureter.
The causative agent, the bacterium Corynebacterium urealyticum, is a slow-growing, strict aerobic, urea-splitting, gram-positive bacillus.
It is a common saprophytic bacterium of skin and mucous membranes and can colonize the urinary tract, generating infection in immunocompromised patients with a history of urinary manipulation and previous antibiotic treatment. It is common in renal transplanted patients (1,2,5).
From the histological point of view, there is an ulcerative-necrotic involvement of the mucosa of the urinary tract with deposit of struvite crystals (magnesium ammonium phosphate), with polymorphonuclear infiltrates and edema of the chorion.
The diagnosis is made by clinical suspicion in patients with recurrent urinary tract infection, with initial negative urine cultures and urine with alkaline pH. Selective blood agar cultures usually show the presence of Corynebacterium urealyticum. Computed tomography shows a characteristic image of fine calcification of the pelvic and ureteral wall (6).

Treatment is based on urine acidification and prolonged antibiotic treatment to eradicate the bacteria. Surgical treatment of lithofragmentation may be required in cases of high lithiasis load.

3. Description of the clinical case:

We present the case of a 72-year-old male patient, former smoker, asthmatic and with a history of pulmonary tuberculosis in childhood.

He was followed up by the Urology Department due to the finding of an infiltrating bladder muscle tumor treated by radical cystectomy with bilateral iliobturator lymphadenectomy and Bricker type urinary diversion. Adjuvant chemotherapy was required due to the finding of a positive lymph node for tumor.

During the follow-up a left hydronephrosis with a soft tissue implant around the uretero-ileal anastomosis affecting the left ureter was observed, as well as an adenopathy in the left iliac vessels.

Urinary diversion is performed by placement of percutaneous echo-guided nephrostomy. Subsequently, endoscopic dilatation of the left ureteroileal anastomosis was performed by antegrade access with placement of a JJ 8-12 Ch /26 cm ureteral catheter.

Thirty days after the operation the patient presented an episode of urinary tract infection with positive culture of left renal urine for Corynebacterium urealyticum, initially treated with a one-week course of culture-guided anti-biotherapy, in our case with doxycycline, being sensitive to tetracyclines and linezolid.

A control CT scan was performed prior to the removal of the JJ catheter with the finding of lithiasis at the proximal loop of the ureteral catheter and linear images covering the mucosa of most of the pelvis and left renal calyces suggestive of encrusting pyelitis (images 1 and 2).

JJ catheter removal is scheduled, with impossibility due to significant calcification of the proximal loop.

It was decided to perform extracorporeal shock wave lithotripsy on ureteral catheter calcification with subsequent endoscopic surgery combined with intrarenal lithotripsy and extraction of the lithiasic fragments. In addition, lasertripsy of major encrusting lithiasis in the upper calyx is performed (image 3).
An 8Ch percutaneous nephrostomy and an 8Ch ureteral catheter were left in place.

During the postoperative period the patient continues treatment with doxycycline. Percussion through the nephrostomy is associated with sub-G solution (a mixture of citric acid, magnesium oxide, sodium bicarbonate and sodium edetate) during seven days of admission and is associated with Lit-control pH Down®. Treatment with doxycycline was maintained for 6 weeks.

Calculus analysis was 80% struvite and 20% ammonium urate. The control CT scan showed no lithiasic debris and the images of linear calcification of the pyelocaliceal mucosa had disappeared (image 4).

Currently the patient is free of lithiasic debris, with scheduled uniJ catheter replacements due to stenosis of the left ureteroileal anastomosis. He has not presented new episodes of UTI in

the last 6 months and presents stability of acid urinary pH maintaining the treatment with Lit-control pH down.

Image 1. Larger volume lithiasis in the upper calyx.

Image 2. Typical linear image of encrusting pyelitis.

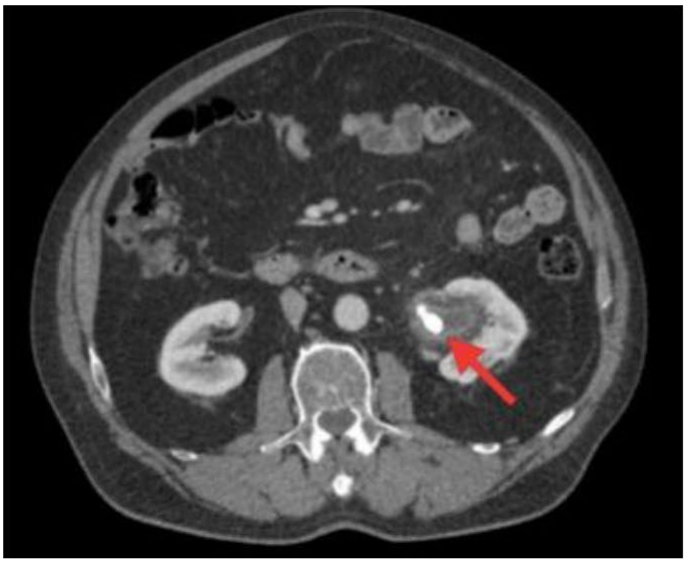

Image 3. Calcification of the proximal loop of the JJ catheter.

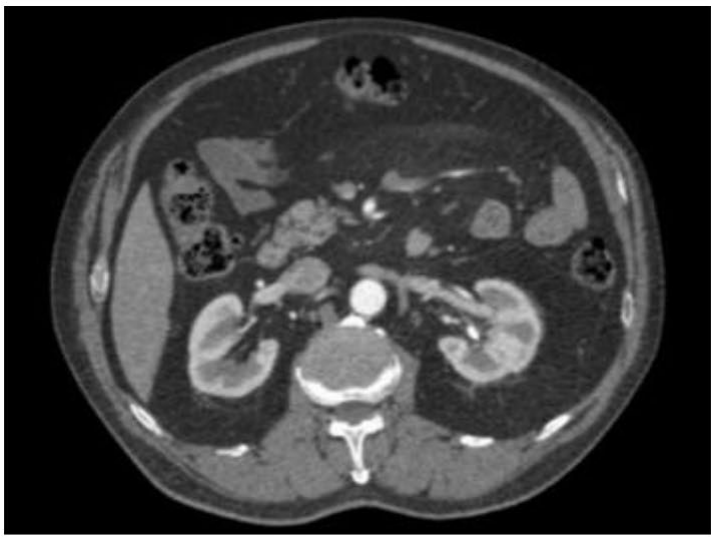

Image 4. CT scan after treatment. It is visualized uniJ catheter in renal pelvis

4. Discussion

Fouling pyelitis is a rare disease whose main risk factors are immunosuppression and urological manipulations. Currently the incidence is growing due to the increase in the number of renal transplants and urological manipulations. Diabetic patients and those with indwelling urinary devices are also at increased risk (1,2).

The occurrence of IP in patients who do not meet these characteristics is exceptional and its diagnosis requires a high clinical suspicion.

In our case, we present a 72-year-old male with a history of radical cystectomy with Bricker-type urinary diversion due to muscle-infiltrating bladder urothelial neoplasia, carrier of a left ureteral catheter secondary to stenosis of the left ureteroileal anastomosis.
He presented calcification of the ureteral catheter shortly after placement, with urine with alkaline pH and struvite crystals; and positive cultures for Corynebacterium urealyticum.

The relationship between Corynebacterium urealyticum infection and fouling disease of the urinary tract, whether pyelitis, pyeloureteritis or cystitis, has been known since the 1980s (3,4).

Corynebacterium urealyticum is a strict aerobic gram-positive bacillus, a urea splitter, which requires an alkaline urinary pH for its growth. It is a common saprophytic microorganism of the skin and mucous membranes.

Diagnosis requires a high clinical suspicion and should be confirmed by urine cultures and imaging tests (ultrasound or CT) with findings suggestive of encrusting pyelitis.

For its treatment we must combine several methods, both surgical and medical. First of all, the attempt to eliminate most of the lithiasic mass by lithofragmentation, either mechanically or with laser, favors the resolution and control of the clinical picture.

Medical treatment is indispensable for the eradication of the causative bacteria. Urine acidification associated with targeted anti-biotherapy is the treatment of choice.

The antibiotic of choice will vary according to the antibiogram of the patient's urine cultures, in our case treatment was associated with doxycycline in a long regimen (around 6 weeks) as it is sensitive to tetracyclines and linezolid.

There are several options for urine acidification, on the one hand direct irrigation solutions of the urinary system such as Suby G, which are administered through a nephrostomy catheter and require hospitalization to monitor tolerance. The main associated complications are pain after administration due to irritation of the urinary mucosa.

On the other hand, there are currently few formulas for oral administration; one of them is Lit-control pH down, whose main component is L-methionine, with good tolerance and few adverse effects, and which allows prolonging treatment to avoid reinfections.

5. Conclusions and recommendations

Fouling pyelitis is a rare disease whose diagnosis requires a high index of suspicion. In patients with associated risk factors such as immunosuppression, carriers of permanent urological devices and with a history of urological manipulation, it should be suspected in cases of urinary tract infections with alkaline urine pH and characteristic radiological image of linear calcification in the mucosa.

Early treatment with anti-biotherapy and acidification of the urine is crucial to avoid the evolution of the disease, which can lead to dysfunction of the urinary system.

The use of Lit-Control pH Down® for urine acidification has been an improvement in view of the scarcity of orally administered compounds, with good availability for patients.

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

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