

## 4th Edition of the Clinical Cases Contest related to the non-surgical clinical management of renal lithiasis.

### *Official template*

**Title: Use of Canoxidin® in a double J kidney transplant recipient with a tendency to calcification.**

**Key words (between 3 and 6): calcification, double J, stenosis, renal transplantation.**

#### **1. Abstract**

Our aim with this case is to recall the importance of pH, its control and medical treatment in those patients prone to urinary catheter calcification.

Method: presentation of a case from our hospital with no surgical alternatives other than double J replacements, which was obstructed every 2 months at the most.

Results and conclusions: After starting treatment with Canoxidin®, we have managed to postpone the replacements for at least 6 months, improving the patient's quality of life and reducing hospital costs by reducing the number of surgeries and admissions.

#### **2. Introduction**

Catheter calcification is the deposition of crystals both inside and outside the catheter (1)\*\*.

The mechanism by which it occurs is not well defined and appears to be a multifactorial process.

The biofilm produced by urease-producing bacteria (Proteus, Pseudomonas, Klebsiella...) seems to play an important role, however calcification also occurs in sterile urine (2).

The most frequent composition is calcium oxalate; therefore, urine characteristics such as pH, saturation of crystallising substances or absence of calcification inhibitors will play an important role (3).

The relationship between urine metabolism and stone formation has already been demonstrated (4). Consequently, medical treatments have been developed for their prevention. Therefore, knowledge of the metabolic alterations in patients with a tendency to calcify urinary catheters can lead to individualised treatments to prevent calcification (1).

Canoxidin® is a drug containing L-methionine (recommended by the UAE urolithiasis guidelines) which acidifies the pH and phytate (inhibitor of calcium lithiasis crystallisation) (5).

It is very interesting for these patients to monitor their pH with a pH meter such as the Lit- Control® pH Meter.

### 3. Description of the clinical case:

#### a. Relevant background

56-year-old woman with Chronic Kidney Disease (CKD) due to probable malignant arterial hypertension diagnosed in July 2011. She started peritoneal dialysis in August 2012. Renal transplant and transplantectomy were performed at the same time due to intraoperative graft thrombosis in June 2017, and peritoneal dialysis was restarted.

In January 2019, she received a second renal transplant which presented stenosis of the pyelic-ureteral junction and underwent pyelic-pelvic anastomosis in March 2019. Subsequently, stenosis appeared in her native ureter in the middle zone; a 15 cm Memokath prosthesis and balloon dilatation were placed in May 2019 and a double J intraprosthesis was placed 6 days after surgery due to persistent stenosis in the proximal ureter.

He remained one year without incident and the Memokath prosthesis (which had distal calcification) was replaced in March 2020 with a 20 cm Memokath prosthesis.

He was admitted in March 2021 due to obstruction of the prosthesis requiring percutaneous nephrostomy. In April 2021, URS (semi-rigid ureterorenoscopy) was performed and calcification of the distal end of the prosthesis was observed; it was replaced with a new one.

#### b. Diagnostic support studies and results

The patient attended the emergency department on several occasions, as explained in the history with altered renal function and obstructive uropathy seen by ultrasound. Urine pH remained around 6 - 7.



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<b>ORINA</b>						
Sistemático de Orina						
Densidad		1010	1.009	1007	1012	1014
pH		6	5	7	6	7
Leucocitos		Positivo +++	Positivo +++	Positivo +++	Positivo +++	Positivo ++
Hemáties		Positivo ++++	Positivo +++++	Positivo ++++	Positivo ++++	Positivo +
Nitritos		Negativo	Negativo	Negativo	Negativo	Negativo
Glucosa		Negativo	Negativo	Negativo	Negativo	Negativo
Proteínas		Positivo ++	Positivo ++	Positivo +	Negativo	Negativo
Bilirrubina		Negativo	Negativo	Negativo	Negativo	Negativo
Acetona		Negativo	Negativo	Negativo	Negativo	Negativo
Urobilinógeno		Negativo	Negativo	Negativo	Negativo	Negativo
<b>ORINA</b>						
Sistemático de Orina						
Densidad		1009	1.019	1009	1010	
pH		7	6	7	6	
Leucocitos		Positivo +++	Positivo +++	Positivo +++	Positivo +++	
Hemáties		Positivo ++++	Positivo +++++	Positivo +++	Positivo +++	
Nitritos		Negativo	Positivo.	Negativo	Negativo	
Glucosa		Negativo	Negativo	Negativo	Negativo	
Proteínas		Positivo +	Positivo ++++	Negativo	Positivo ++	
Bilirrubina		Negativo	Negativo	Negativo	Negativo	
Acetona		Negativo	Negativo	Negativo	Negativo	
Urobilinógeno		Negativo	Negativo	Negativo	Negativo	

Image with pH monitoring in urine system before starting medical treatment.

**c. Diagnosis**

Renal transplant recipient with double J due to ureteral stenosis with a tendency to catheter calcification.

**d. Treatment**

In November 2022 a new obstructive uropathy appeared, so the prosthesis was removed and a double J was placed. Seven months later, in July 2022, the double J was replaced due to new obstruction. Just one month later, a percutaneous nephrostomy was performed due to new obstruction and the double J was replaced. At this point it was decided to start medical treatment with Canoxidin®, taking into account the urine pH of our patient.

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<b>ORINA</b>				
Sistemático de Orina				
Densidad	1.011	1010	1.012	1011
pH	5.5	6	5.5	5
Leucocitos	Positivo +++	Positivo +++	Positivo +++	Positivo +++
Hematies	Indicios	Positivo +++	Positivo +++	POS 5+
Nitritos	Positivo +	Positivo	Positivo +	Positivo
Glucosa	Negativo	Negativo	Negativo	Negativo
Proteínas	Negativo	Positivo +	Indicios	Positivo +
Bilirrubina	Negativo	Negativo	Negativo	Negativo
Acetona	Negativo	Negativo	Negativo	Negativo
Urobilinógeno	Negativo	Negativo	Negativo	Negativo

Urine systemic imaging after initiation of treatment with Canoxidin®.

**e. Developments and follow-up**

Six months later, an early double J replacement was scheduled due to the previous history. The catheter was in good condition and without calcification when it was replaced.

**f. Clinical results**

Thanks to medical treatment, we have managed to prolong the replacement of the double J catheter to at least 6 months, as well as to avoid emergency admissions or graft damage due to obstructive uropathy.

**4. Discussion**

We have seen in our clinical case the importance of urinary metabolism; it is essential to know the characteristics of pH and its consequences, as well as the presence of inhibitors or not of calcium deposition.

Although the double J is a basic tool for the urologist, we must know how to manage the possible complications that may arise. In this case, calcification of the graft, which can lead to graft loss or even death of the patient (6).

**5. Conclusions and recommendations**

We were faced with a case that was visually unremarkable but which became a real challenge for us. After having exhausted all available surgical routes for the treatment of ureteral stricture in a functioning renal graft, we have found the solution thanks to medical treatment. The evolution of endourology allows us to bring cases forward that years ago would have had a poor solution. The double J is one of these tools; even so, it can

sometimes complicate our existence due to the symptoms it produces in patients or, as in our case, by ceasing to perform its main function due to its calcification.

Knowledge of the metabolism and characteristics of urine is essential to guide a diagnosis and therefore a possible treatment in order to continue providing the best possible care to our patients.

#### **6. Bibliographical references (\*of special interest, \*\*of extraordinary interest)**

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