INTRODUCTION: The dissolution of urinary stones could be performed in the patients with urinary obstruction caused by phosphate, or uric acid stones, through the percutaneous nephrostomy (PCN).

CASE REPORT: A 27-year-old woman with complete obstruction of the solitary left kidney due to uric acid stones is presented. The woman was admitted in emergency unit due to anuria. Five days after PCN, irrigation with 1.6% sodium bicarbonate solution was initiated. Due to complete ureteral obstruction, the "Y" extension with the valve was connected to PCN and to the urinary bag, which enabled the patient to perform intermittent self-irrigation. After 12 days of irrigation, all the stones dissolute and ceased.

CONCLUSION: In the era of ESWL, PCNL and ureterorenoscopy, PCN- dissolution of urinary stones is rare procedure. However, this minimally invasive procedure could be successfully performed in selected cases.

Key words: uric acid stones, PCN, PCN- dissolution, urine alkalization.

INTRODUCTION

The dissolution of urinary stones is relatively old method. In 1932 Keyser treated urinary stones with the retrograde infusion of hemolytic substance. Similar procedure was performed in 1943, by Suby and Albright. Suby's solution is manufactured today, in the commercial form. These first attempts of stone dissolution were followed by common complications: ureteral stents were commonly occluded with debris and urinary infection was usual. Antegrade approach, via percutaneous nephrostomy (PCN), was far more successful and followed by lower complication rate.

At least few percent of most common stones, like phosphate and struvite stones, can be managed with the combination of PCN - dissolution, extracorporeal shock - wave lithotripsy (ESWL) and percutaneous nephrolitholapaxy (PCNL). Available solutions for PCN - dissolution are Hemiacidrin and Suby-G solution (citric acid in combination with magnesium salts).

Uric acid stones constitute 10% of all urinary stones. These stones are the products of uric acid crystallization, in the acid urine, (pH < 5.75) in the presence of normal or increased serum acid uric levels. Uric acid is the end product of the purine metabolism; increased serum concentrations of uric acid can be the result of increased purine intake, or massive cellular destruction (during chemotherapy). The treatment options for uric acid stones include urine alkalization, ESWL, PCNL, or, rarely, surgery. Urine alkalization can be achieved with alkaline solutions that maintain urinary pH in the range 6.2-6.8. The most commonly used solutions are citric acid solutions (potassium-sodium citrate) which require constant monitoring of urine pH. In cases with hyperuricemia, xanthine oxidase inhibitors (allopurinol) are indicated.

Stone dissolution is slow process; a 1 cm large uric acid stone requires approximately one month of peroral treatment for complete dissolution. The more rapid treatment can be achieved with direct irrigation of alkaline solutions, like 1.6% sodium bicarbonate solution, through PCN, with the rate of 120 mL of solution per hour. With this technique, the majority of uric acid stones require 5-6 days for complete dissolution.

CASE REPORT

A 27-year-old woman with complete obstruction of the solitary left kidney due to uric acid stones is presented. The woman was admitted in emergency unit, due to extreme fatigue, anuria and uremic syndrome, with highly elevated serum creatinine (1200 μmol/L) and serum po-
Potassium level (7.2 mEq/L). Six years ago, the patient underwent nephrectomy on the right side, due to calculous pyonephrosis.

Abdominal ultrasonography (US) revealed marked dilation of the pyelocalyceal system and the ureter. In addition, several stones were seen during abdominal US, while plain kidney-ureter-bladder (KUB) radiograph revealed no visible stones. Urgent PCN was done at the admission, what was followed by rapid restoration of diuresis. After three days, serum creatinine was within normal range; serum level of uric acid was elevated. The first antegrade urography revealed dilated pyelocalyceal system and five stones in the lower calyx (Figure 1).

The next antegrade urography revealed dilated pyelocalyceal system and five stones in the lower calyx (Figure 1). The next antegrade urography revealed dilated ureter, with the complete obstruction, due to uric acid stone in the distal third of the left ureter (Figure 2).

Five days after PCN, irrigation with 1.6% sodium bicarbonate solution was initiated. However, due to complete ureteral obstruction, continuous irrigation was impossible. Therefore, the "Y" extension with the valve was connected to PCN: one channel was connected with the irrigating system, up, and the other with the urine bag. The patient was instructed how to open the valve for irrigation and to close it, when she feels the pain, and to permit the fluid to flow down, in the bag. After 10 days of irrigation and peroral administration of allopurinol (300 mg daily), antegrade urography showed complete dissolution of all kidney stones and the reduced size of the lower ureteral stone (Figure 3).

After 12 days of irrigation, obstruction ceased and the contrast dye entered the bladder (Figure 3a).

Due to radiographic appearance of UPJ stenosis, Whitaker's test was done: with the irrigation rate of 10 mL/min through PCN, median renal pelvis pressure was normal, 10 cm H₂O. After retrograde urography, urinary catheter and PCN were removed and the patient discharged (Figure 4).

CONCLUSION

In the era of ESWL, PCNL and ureterorenoscopy, PCN-dissolution of urinary stones is rare procedure. In fact, the described case was happened 15 years ago. However, this...
minimally invasive procedure could be successfully performed in selected cases.

**SUMMARY**

**KOMPLETNA DISOLUCIJA MULTIPLIH URATNIH KONKREMENATA KROZ PERKUTANU NEFROSTOMIJU KOD BOLESNICE SA JEDINIM BUBREGOM**

Uvod: Disolucija urinarnih konkremenata kroz percutanu nefrostomiju (PCN) može da se izvede kod bolesnika sa urinarnom opstrukcijom izazvanom fosfatnim, ili uratnim konkrementima.

Prikaz slučaja: Prikazan je slučaj uratne kalkuloze kod bolesnice stare 27 godina, koja je dovela do potpune opstrukcije uretera i do anurije. Pet dana posle plasiranja PCN, započeto je ispiranje kroz PCN, rastvorom 1.6% Na- bikarbonata. S obzirom na kompletnu opstrukciju, na PCN je montiran "Y" nastavak, koji je bolesnici omogućavao da sama započinje ispiranje, odnosno da zatvori slavinicu kada oseti bol i da isprazni rastvor u urinarnu kses spojenu sa drugim krakom "Y" nastavka. Posle 12 dana irrigacije, svi konkrementi su se istopili.

Zaključak: U eri ESWL, PCNL i ureterorenoskopije, disolucija urinarnih konkremeneta kroz PCN je veoma retka. Ipak, ova minimalno invazivna procedura može uspešno da se sprovede u biranim slučajevima.

Klučne reći: uratni kamen, PCN, disolucija kamena kroz PCN, alkalizacija urina

**REFERENCES**


FIGURE 5.
ANTEGRADE UROGRAPHY SHOWING MODERATE URETEROHYDRONEPHROSIS, NARROWED UPJ AND COMPLETELY PASSABLE LEFT URETER. DUE TO RADIOGRAPHIC APPEARANCE OF UPJ STENOSIS, WHITTAKER'S TEST WAS DONE: WITH THE IRRIGATION RATE OF 10 ML/MIN THROUGH PCN, MEDIAN