Brawijaya Journal of Urology
January 2023, Volume 3, Issue 2
p-ISSN: 2721-4982 **e-ISSN**: 2722-4546
DOI: https://doi.org/10.11594/bjurology.2023.003.02.2

Nephrolithiasis treated with RIRS on single kidney patient: A Case Report

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Abstract. Urinary stones is a common disorder and affects a considerable number of people worldwide. Nephrolithiasis (kidney stones) is one of the kidney diseases, where the discovery of stones containing crystal components and organic matrix is the biggest cause of urinary tract disorders.
Case. The case of this left kidney stone was reported at WZ Johannes General Hospital, Kupang, East Nusa Tenggara, Indonesia. The patient is a 31 year old female with a single kidney, renal stone with the size measured -+ 1.2 cm (HU = 1078) at the lower calyx pole. The patient came to the ER with complaints of left flank pain and patient complaints of left lower back pain, lower left abdomen and radiating to the groin. The patient also complains of the most pain at night and often wakes up to urinate and can't hold urine so that the patient sometimes starts urinating before arriving at the bathroom, the patient's urine output is also small. The patient often complains of gritty urine and foam at the end of the urine and has time to urinate blood. RIRS surgical procedure was performed to release the stone.
Conclusion. The cause of the Renal stone should be considered prior to treatment as eliminating the cause and the underlying factor will reduce the complications and recurrence rates.

Keywords: nephrolithiasis, RIRS

Introduction

Urinary stones is a common disorder and affects a con-siderable number of people worldwide. Globally, 12% of the population suffers from kidney stones at a stage of life. During the past decades, incidence of kidney stones increased both in developing as well as devel- oped countries [1]. There are four major types of stone deposited in kidneys which are- calcium (75 to 85%), struvite (2 to 15%), uric acid (6 to10%) and stones of cystine (1 to 2%) [2]. Risk factors associated with the formation of urinary calculi can be divided into two main groups, intrinsic or extrinsic factors. The former one includes age, gender, ethnic and familial backgrounds, while the letter group consists of climate and environment, lifestyle and dietary habits, occupation and education level. In most countries, males are predisposed to urolithiasis, with male to female ratio ranging from 1.3 to 5 and overall, the incidence of urinary tract stones increased with age, which peaked in the age group of 30–60 years and decreased afterwards [3].

Renal agenesis is a congenital malformation in which one, unilateral or both, bilateral, fetal kidneys fail to develop. Unilateral renal agenesis (URA) is defined as the one -sided congenital absence of renal tissue resulting from failure of embryonic kidney formation [4]. Incidence of renal agenesis was approximately 1 in 1000 populations, while bilateral agenesis was in 2500. The incidence of renal agenesis is mostly associated with the presence of other malformations in the urinary tract known as congenital anomalies of the kidney and the urinary tract (CAKUT). Previous studies have suggested that unilateral renal agenesis is a harmless congenital disorder, however, the data show that 40-50% of adults with unilateral renal agenesis need dialysis bye the age of 30 years [5].

Case Report

A 31- year-old-female, who worked as an entrepreneur, Visited Prof. Hospital. Dr. W Z Johannes Kupang general hospital with complaints of pain in the left flank. The patient said the same complaint had been felt since 2013 then the patient did an abdominal ultrasound and there was a stone in the patient's left kidney then was given medication but was not routinely controlled. In

2019, the patient also complained of left lower back pain, lower left abdomen and radiating to the groin. The patient also complains of the most pain at night and often wakes up to urinate and can't hold urine so that the patient sometimes starts urinating before arriving at the bathroom, the patient's urine output is also small. The patient often complains of gritty urine and foam at the end of the urine and has time to urinate blood. The patient went to Siloam Hospital, while at Siloam Hospital the patient was diagnosed with stones in the left kidney and the patient was given ESWL-. After surgery the patient felt better but in June 2022 the patient still often complained of flank pain. Flank pain is felt intermittent, feels like a prickling sensation and radiates to the solar plexus and upper right abdomen. This complaint interferes with the patient's daily activities. Then the patient went to Siloam Hospital and was referred to W Z Johannes for observation for 2 weeks. After observing the patient, Ureterorenoscopy (URS) was performed on June 29, 2022 but it was not successful due to a narrowing of the ureter, then a DJ Stent was installed and removed on August 3, and after being released, Retrograde Intrarenal Surgery (RIRS) was performed. The patient also complained of intermittent fever before admission to the hospital.

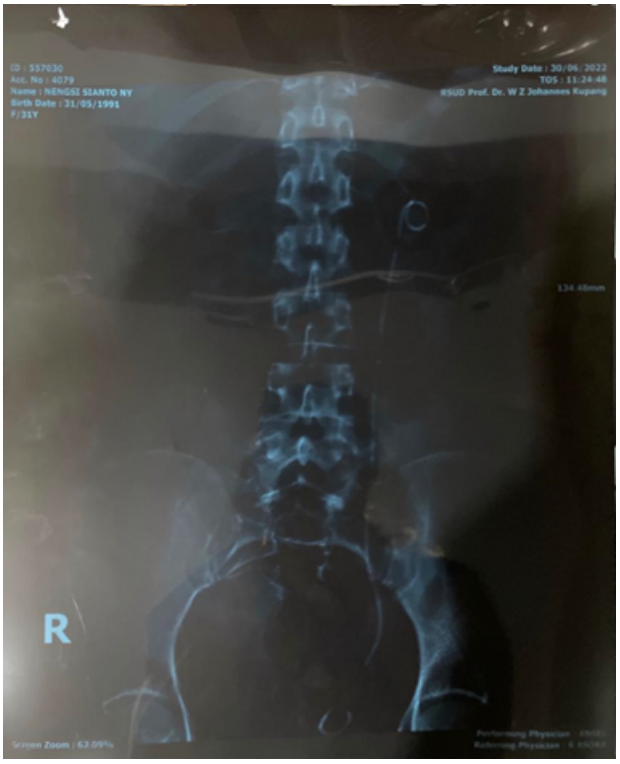

Figure 1. BOF post URS shows Susp. Left nephrolithiasis dd/fecalith, Susp. Proximal 1/3 right ureteral stone and installed DJS on the left urinary tract

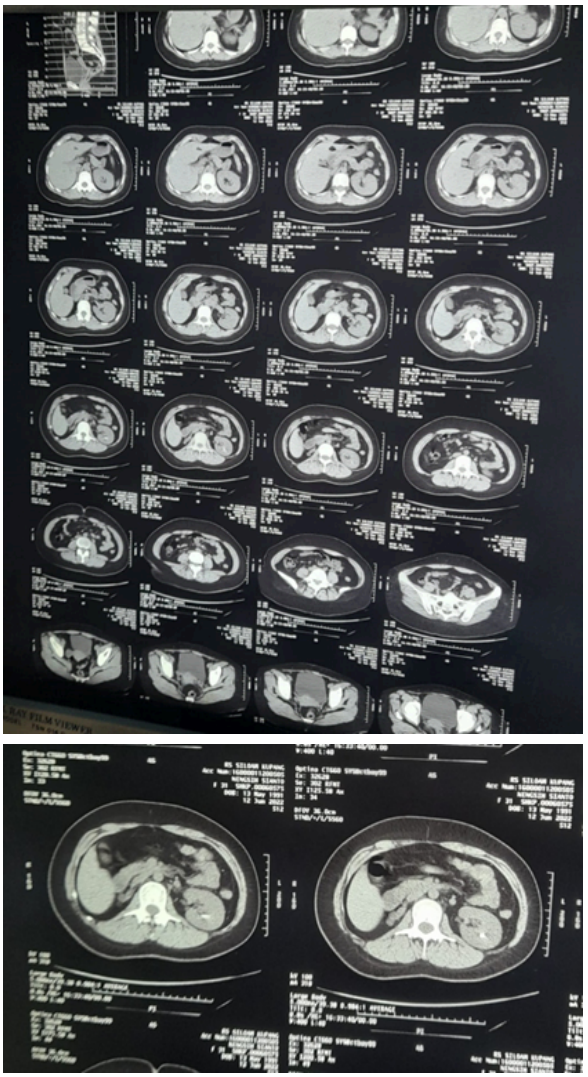

Figure 2. CT Urography Non Contras (axial view) shows Left nephrolithiasis size -+ 1.2 cm (HU = 1078) in the lower calyx pole.Single kidney left

On physical examination, vital signs were within normal limits. There was costo vertebral angle (CVA) knock pain on the left side. Laboratory tests showed a decrease in hemoglobin and an increase in leukocytes. BOF post URS showed Susp. Left nephrolithiasis dd/fecalith, Susp. Proximal 1/3 right ureteral stone and installed DJS on the left urinary tract (Figure 1). CT Urography non contras (axial view) shows Left nephrolithiasis size -+ 1.2 cm (HU = 1078) in the lower calyx pole and Single kidney left. (Figure 2) CT Urography non contras (coronal view) shows Left nephrolithiasis size -+ 1.2 cm (HU = 1078) in the lower calyx pole, single kidney left (Figure 3). C-arm shows Nephrolithiasis 2x1 cm (S) at the lower pole (Figure 4) Patient underwent RIRS operation. RIRS (S) with ureteroscope, laser lithotripsy with guided c-arm, clear, operation completed.

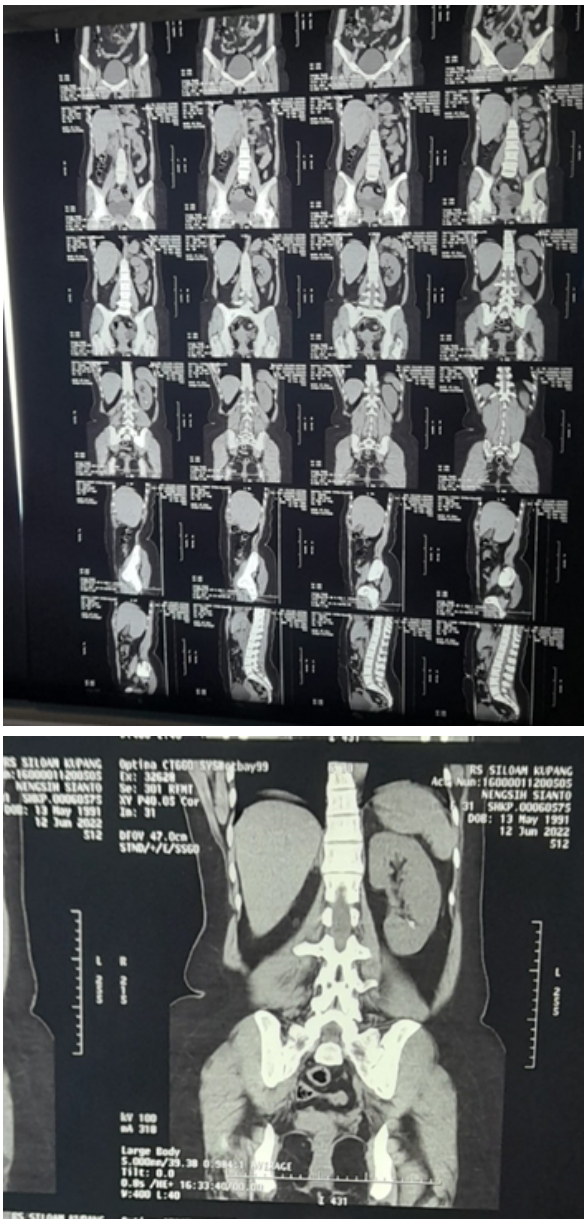

Figure 3. CT Urography Non Contras (coronal view) shows Left nephrolithiasis size -+ 1.2 cm (HU = 1078) in the lower calyx pole.Single kidney left

Figure 4. C-arm shows Nephrolithiasis 2x1 cm (S) at the lower pole

Discussion

Urinary stones are a condition in which a hard, stone-like mass forms along the urinary tract, which can then cause pain, bleeding and infection. Nephrolitiasis (kidney stone) is one of the kidney diseases due to the formation of hard material that resembles a stone and consists of crystals and an organic matrix. One type of kidney stone is based on stone.

In Indonesia, urinary tract stones still occupy the most common cases among all urological cases. There are no definite data on the incidence and prevalence of urinary stone in Indonesia currently, but it is estimated to be high every year. In the United States 5-10% of the populations suffer this disease, while worldwide on the average there are 1-12%. The prevalence of the disease is estimated at 5% in adult women and 12% in adult males. Four out of five patients are men, while the peak age is the third to fourth decade. (0.8%) [6-7].

The formation of kidney stones is thought to correlate with urinary flow disorders, metabolic disorders, urinary tract infections, dehydration, and idiopathic. There are several risk factors for stone formation, including intrinsic and extrinsic factors. Intrinsic factors include heredity (heredity), age (often found at 30-50 years old), and gender (three times as many male patients as female patients). Some of the extrinsic factors include geography, climate, temperature, water intake (lack of water intake and high levels of calcium, minerals in the water consumed), diet (diet with lots of purines, oxalate, calcium), and work (lack of activity or sedentary life) [3].

Calcium stones 70-80% of all urinary tract stones (Cause Hypercalciuria, hyperoxaluri, hypocitraturia, hypomagnesia), Struvite stones formed due to infection in the urinary tract (Proteus sp, Klebsiella, Enterobacter, Pseudomonas, and Staphylococcus) Uric Acid Stones uric acid is a by-product of purine metabolism. About 5-10% of all urinary tract stones [8].

Our patient, a female aged 31 where gender has a greater risk factor is male. The other factor is habit of our patients in terms of drinking habits where our patients drink less water. In our patient had a history of kidney stones in 2013, have an anatomical abnormalities that is only one kidney.

The clinical presentation of urinary tract stones are asymptomatic, symptomatic to kidney failure. Symptomatic clinical symptoms can be both classic symptoms and or symptoms of complications. Classic symptoms can include flank pain (colic or non-colic) and complication symptoms such as bloody urination (hematuria), spontaneous urinary

tract stone discharge, fever to kidney failure. The physical examination of urinary tract stones starts from the examination of the generalisata (general) status and the examination of the urological localist status. Supporting examinations to support the enforcement of the diagnosis of urinary tract stones are laboratory examinations, radiological examinations. The patient initially had a classic complaint (left flank pain) and in 2013 the patient did an ultrasound when the results came out the patient was given medication and the patient was not routinely monitored. This patient also had symptoms of complications, namely bleeding when urinating).

Radiological support examination can be done a plain photo of the abdomen but can only assess radioopaque stones, ultrasound examination where for ultrasound can show the size, shape, position of the stone and the presence of obstruction, IVP to see non-opaque stones indicated by the presence of filling defects. If there is a stone, it will show echoic shadow. Non-contrast CT-Scans can determine the size and density of stones. CT-Scan can detect uric acid stones and xanthine. In this patient, an ultrasound examination was carried out and it was found that there was a left kidney stone. A BOF examination after URS was carried out and a left kidney stone, proximal 1/3 right ureteral stone, DJS installed on the left urinary tract was obtained. A CT urography was performed and a nephrolithiasis sinistra measuring +/- 1,2 cm (HU= 1078) in the lower calyx pole, single left kidney and right or left bladder not seen stone was obtained. IVP MRI examination can be used as another modality to assess the presence of urinary tract obstruction and can see stones as a 'filing defect'. The supporting examination carried out to establish the diagnosis in this patient is a laboratory examination in the form of complete blood, which is obtained by anemia and leukocytosis.

Stones in the urinary tract that have caused problems in the urinary tract must be removed as soon as possible. The indication to take action on the patient is if the stone has caused obstruction, infection or must be taken due to social indications. Stone treatment can be in the form of medicamentous or surgically. Medicamentosa if the stone is <5 mm in size is expected to come out spontaneously. Other types of surgical options are ESWL if the stone is in the proximal ureter, PCNL if the stone is in the kidneys and ureteroscopy is inserting a ureteroscopic device per urethra to see the condition of the ureter then the stone is broken through ureteroscopic guidance.

From EAU, the gold-standard surgical treatment for renal stones is the same for most of kidney stones size bigger than 2.0 cm, which is the percutaneous nephrolithotomy (PCNL). Ureteroscopy and RIRS were performed in this patient, which is minimally invasive surgery by inserting an endoscope tube through the urinary opening and down the urinary tract, namely the urethra, bladder, ureters, and kidneys. Using laser technology, the stone is broken and then removed. With this method, no incisions will be found on the skin. This procedure is best suited for smaller stones but does not allow ESWL to be performed.

Therate of this disease will return (recurrent), depending on how we manage life when after the elevation of the stone. After the stones are removed from the urinary tract, it is necessary to carry out prevention. Prevention can be in the form of: drink 2,3-3 liters per day, Monitor fluid. Fluids can be assessed by the color of the urine. The color of urine that is clear to yellow indicates the body is receiving enough fluids, diet to reduce levels of stone-forming components, exercise 2-3 times a week, and avoid stress.

Conclusion

A case of renal stone have been reported at W. Z. Johannes General Hospital, Kupang, East Nusa Tenggara, Indonesia. The diagnostic methods include anamnesa, physical examination, BOF ultrasonography anf CT urography In this case managed by the RIRS surgical procedure. The cause of the Renal stone should be considered prior to treatment as eliminating the cause and the underlying factor will reduce the complications and recurrence rates.

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