

EXPERIENCE OF BILATERAL SYNCHRONOUS PERCUTANEOUS NEPHROLITHOLAPAXY(PCNL)

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ABSTRACT

Objective: This case report will present bilateral synchronous percutaneous nephrolitholapaxy (PCNL) that was performed in Saiful Anwar General Hospital Malang for the first time. **Case(s) Presentation:** 49 years old male with flank pain on both sides continuously. Non contrast abdominal Computed Tomography (CT) scan showed bilateral pyelum stone and bilateral hydronephrosis. From blood analysis, the creatinine serum was 1.5 mg/dL and ureum serum was level 69.8 mg/dL. **Discussion:** Bilateral synchronous PCNL was performed in prone position, and stone fragmentation was done with pneumatic lithotripter, the operation last for about 2 hours with minimal amount of bleeding. After 3 months of follow-up, urology ultrasound and abdominal X-ray shows no residual stone, and normal ureum-creatinine level (0.77mg/dL; 43.7mg/dL). **Conclusion:** Bilateral synchronous PCNL is a safe choice to be done in order to treat bilateral pyelum stone, it can decrease length of stay, total cost therapy, and morbidity of the patient.

Keywords: Bilateral synchronous PCNL, pyelum stone.

ABSTRAK

Tujuan: Laporan Kasus ini mempresentasikan tindakan bilateral synchronous percutaneous nephrolitholapaxy (PCNL) yang pertama kali dilakukan di RS Saiful Anwar. **Presentasi Kasus:** Laki – laki usia 49 tahun dengan keluhan nyeri pada pinggang kanan dan kiri. CT scan abdomen tanpa kontras menunjukkan batu pyelum bilateral disertai dengan hydronephrosis bilateral. Pada pemeriksaan analisa darah, nilai creatinine serum 1.5 mg/dL dan kadar ureum darah 69.8 mg/dL. **Diskusi:** Dilakukan tindakan bilateral synchronous PCNL pada posisi prone, pemecahan batu dilakukan dengan menggunakan pneumatic lithotripter, tindakan operasi berlangsung selama 2 jam dengan perdarahan durante operasi minimal. Setelah followup selama 3 bulan, dilakukan pemeriksaan ultrasonografi urologi dan Foto rontgen perut, tidak didapatkan batu sisa, disertai kadar ureum dan kreatinin yang normal (0.77 mg/dL; 43.7 mg/dL). **Simpulan:** Bilateral synchronous PCNL merupakan suatu pilihan prosedur yang aman untuk tatalaksana batu pyelum bilateral, Tindakan ini dapat mengurangi hari perawatan rumah sakit, total biaya perawatan dan juga morbiditas dari pasien.

Kata kunci: Bilateral synchronous PCNL, batu pyelum.

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INTRODUCTION

Kidney stone is the most common urological condition, and its prevalence was about 8.8% globally, 12% in men and 7% in women, it can be occurred both unilaterally or bilaterally. If it is bilateral kidney stone, it will cause bilateral obstructive uropathy and kidney failure, so consideration is needed for immediate intervention.¹

PCNL is the treatment of choice for treating kidney stone with size greater than 10 mm.² Even after the invention of Extracorporeal Shock Wave Lithotripsy (ESWL), it still preferred method in

patients with large, dense stone or staghorn stones. It can be performed with many positions such as supine, prone, modified supine, etc.³ In order to decrease patient morbidity and total cost therapy, bilateral synchronous PCNL has been introduced and it showed great result and comparable to staged PCNL.⁴

Although some studies stated that supine PCNL offered better cost effectiveness compared to prone in term of transfusion cost, disposable equipment costs for surgery, disposable cost for anesthesia, and total cost,⁵ but for this case, we did bilateral synchronous PCNL on prone position to gain easier access on both kidney.

CASE(S) PRESENTATION

A 49 years old male has suffered from bilateral flank region pain continuously for about 3 months, the pain was worsening for one month. He had a history of vesicolithotripsy and bilateral DJ stent insertion due to bladder stone and bilateral hydronephrosis. Ultrasonography examination (Figure 1) shows multiple stone on right and left kidney with hydronephrosis.

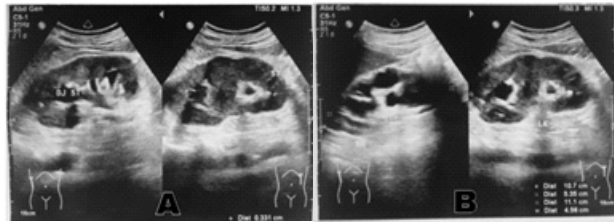


Figure 1. Ultrasonography Examination, (A) Right Kidney: the picture of right kidney shows kidney stone on the upper pole, DJ Stent intrarenal and mild ectasis of Kidney. (B) Left Kidney: the picture show the left kidney with moderate ectasis.

Non contrast abdominal CT scan (Figure 2) indicated multiple stone in right renal pelvis with the largest size of 1.5 x 1.3 x 1.2 cm, 1342 Hounsfield Unit, and severe hydronephrosis. Left renal pelvis stone measuring 1.6 x 1.3 x 1.0 cm,

1286 hounsfield unit and moderate hydronephrosis. From blood analysis the creatinine serum 1.5 mg/dL and ureum level 69.8 mg/dL.

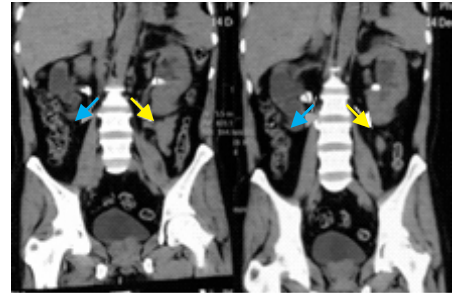


Figure 2. Non Contrast Abdominal CT. The picture show right pyelum stone with severe hydronephrosis (blue arrow), and left pyelum stone with moderate hydronephrosis (yellow arrow).

Bilateral synchronous PCNL was performed on both kidney (Figure 3), and the puncture was done with fluoroscopy guidance. Lower calyx approach was done for both kidney (Figure 4), one lateral to approach the stone, and we performed lithotripsy using pneumatic lithotripter for fragmentation. The whole operation last for 2 hours with 30cc total bleeding, after that we insert DJ stent on both kidney and PCNL guide wire was removed.



Figure 3. Patient placed on prone position to gain easier access to both of kidney.



Figure 4. Antegrade Pyelography (APG) from left and right Kidney showed hydronephrosis grade II on right kidney, and hydronephrosis grade IV on left kidney.

Patient post operative evaluation was performed using abdominal plain x-ray and urology ultrasound (Figure 5). There are no residual stone on both kidney, with double J (DJ) stent was placed in good condition.

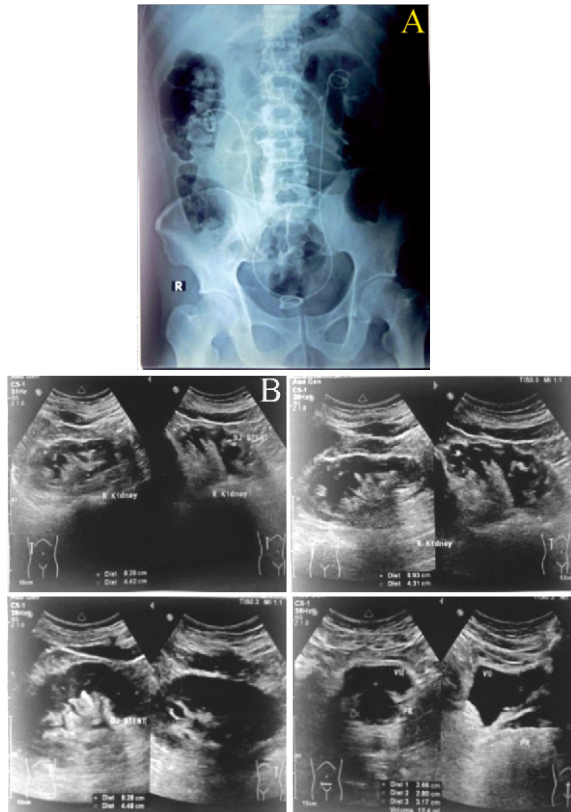


Figure 5. (A) Abdominal X-Ray: No residual stone found, and DJ stent placed on right and left kidney; (B) Urology Ultrasonography: No residual stone on both kidney.

After 3 months of follow-up, patient showed excellent condition with 0.77 mg/dL of ureum serum level and 43.7 mg/dL of creatinine serum level.

DISCUSSION

Patient with obstructive uropathy condition, have increased renal pelvic pressure and intra tubular hydrostatic pressure, that can cause reduction in glomerular filtration and renal blood flow, which may result in kidney damage.⁶ If this happen on both of the kidney, the patient will develop permanent renal failure on both of kidneys, so immediate action is needed in order to treat the obstruction. Patient with bilateral kidney stones also faced with more morbidity such as longer hospital stay, multiple

operations procedure, and many other complications.

Large bilateral kidney stone usually require multi sessions operations to achieved stone free condition. Before 1980, this approach meant a potential for significant consequences, including pain, incisional hernia, residual stones, extensive blood loss necessitating transfusion, kidney insufficiency or failure, and the need for further open surgery in recurrent or persistent stone.

After its success of kidney stone extraction through percutaneous nephrostomy tube for the first time in 1976 by Fernstrom and Johanson,⁴ PCNL became popular procedure for kidney stone treatment. Percutaneous nephrolithotomy has been declared to be safe for almost all patient groups, including the elderly, children, the morbidly obese, and those with renal anomalies. Moreover, percutaneous management of bilateral renal stone turn out to be safe and effective in selected patients.^{3,7,8} From European Association Urology guidelines and Ikatan Ahli Urologi Indonesia Guidelines stated that PCNL was recommended to treat kidney stone larger than 1 cm, its stone free rate was hardly affected by stone size. As for complication associated with PCNL there were fever (10.8%), transfusion (7%), thoracic complication (1.5%), sepsis (0.5%), organ injury (0.4%), embolisation (0.4%), urinoma (0.2%), and death (0.05%).⁹⁻¹⁰

For large and complex kidney stone there is also laparoscopic option, Duarsa et al study comparing laparoscopic pyelolithotomy and PCNL showed that PCNL have less overall complication like fever, hemoglobin decrease and post operative blood transfusion.¹¹

Typically, PCNL for bilateral kidney stones is performed as a staged procedure, advised by the surgeon preferences, stone burden, patient comorbidities, degree of obstruction, and the intraoperative difficulties.⁸⁻⁹ The initial procedure is commonly performed on the side which has more complex stone or higher degree of obstruction to preserve kidney function, and the contralateral procedure is performed several weeks to months later.⁴⁻⁵ As time passed, there are many technique and equipment improvements on PCNL, but the management of bilateral kidney stone remains a challenge.⁷

In 1987, Colon-Perez and associates reported on three patients who were treated with synchronous bilateral PCNL for 0.8 cm to 3.8 cm

kidney stones. Their study found that there were no significant difference of blood loss and postoperative pain compared with patients underwent staged PCNL.¹²

In 2004, Silverstein et al first reported a large retrospective study that compared staged vs bilateral synchronous PCNL, it reported similar stone free-rates, blood loss per operation, and transfusion rate. But in synchronous group, the total operative time, hospitalization, total blood loss, and the total number of procedures were obviously significantly lower, make it considered as an effective treatment for bilateral kidney stone.^{4,13}

Williams and Hoenig suggest profile of patients that eligible for bilateral non-simultaneous, the same session procedures.¹¹ They suggested that surgery on the contralateral kidney should not be proceed in patients with the first surgery caused in a fall in hemoglobin (Hb) of >3 g/dL, >180 min of operative time, hypotension. Also, they suggested the following exclusion criteria for SBES endoscopic treatment: stone burden of >1000 mm², complex intrarenal anatomy, age >50 years, >2 ASA score, <12 g/dL preoperative Hb.¹³

As many studies showed efficacy, for the first time we tried to perform bilateral synchronous PCNL for bilateral pyelum stone at our center, Saiful Anwar General Hospital, Malang, Indonesia.

CONCLUSION

Bilateral synchronous PCNL is a promising procedure to treat bilateral kidney stone, it can significantly reduce the patient's total cost therapy, hospital stay, blood component transfusion, infection, total operation time because they only need to have one operation procedure. Even though the benefit offered was great, bilateral synchronous PCNL was a difficult procedure. It largely depends on operator's experience, and favourable only in selected patients with uncomplicated bilateral stone.

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