PERCUTANEOUS CYSTOLITHOLAPAXY AS AN ALTERNATIVE APPROACH FOR GIANT BLADDER STONES: A CASE SERIES OF PATIENTS WITH SIGNIFICANT COMORBIDITIES

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ABSTRACT

Objective: *We reported two giant bladder stones cases, with significant comorbidities and mentally impaired patients, treated with PCCL.* ***Case(s) Presentation:*** *We report two cases of giant cystolithiasis (sized 8.8 cm x 7.2 cm and 7.0 cm x 5.8 cm) in male patients with impaired renal functions and mental illness. We performed PCCL on both patients with cystoscopy-guided bladder puncture and dilation, under spinal anesthesia. Stone fragmentation through transurethral (pneumatic) and percutaneous (suprapubic amplatz ultrasound) lithotriptors was performed simultaneously.* ***Discussion:*** *Stone fragments were evacuated through the nephroscope. These fluoroscopy-free procedures were performed under one hour. The patients were discharged on day three post-operatively without indwelling catheter.* ***Conclusion:*** *We performed PCCL with simultaneous transurethral fragmentation in giant bladder stone cases presenting with impaired renal functions and mental illness. We faced no significant post-operative issue. This technique, or its modified approach, is safe and applicable.*

Keywords: *Percutaneous cystolitholapaxy, bladder stones, urinary tract stone, comorbidity.*

ABSTRAK

Tujuan: *Kami melaporkan dua kasus batu kandung kemih raksasa, dengan komorbiditas yang signifikan dan pasien gangguan mental, diobati dengan PCCL.* ***Presentasi Kasus:*** *Dalam studi ini terdapat dua laporan kasus sistolitiasis raksasa (berukuran 8.8cm x 7.2cm dan 7.0 cm x 5.8 cm) pada pasien pria dengan gangguan fungsi ginjal dan penyakit mental. Kami melakukan PCCL pada kedua pasien dengan tusukan dan pelebaran kandung kemih yang dipandu sistoskopi, dengan anestesi spinal.* ***Diskusi:*** *Fragmen batu dievakuasi melalui nefroskop. Prosedur bebas fluoroskopi ini dilakukan kurang dari satu jam. Pasien dipulangkan pada hari ketiga setelah operasi tanpa pemasangan kateter.* ***Simpulan:*** *Kami melakukan PCCL dengan fragmentasi transuretra simultan pada kasus batu kandung kemih raksasa dengan gangguan fungsi ginjal dan penyakit mental. Kami tidak menghadapi masalah setelah operasi yang signifikan. Teknik ini, atau pendekatan yang dimodifikasi, aman dan dapat diterapkan.*

Kata Kunci: *Sistolitolapaksi perkutan, batu kandung kemih, batu saluran kemih, komorbid.*

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INTRODUCTION

Bladder calculi remain the leading urinary tract stone in Asia. The prevalence is 4-20%, accounting for approximately 5% of all urolithiasis.[1-2] It is often associated with bladder outlet obstruction, especially benign prostatic hyperplasia. Migrating ureteral stone is usually not 'giant' in origin, and often voided within the normal condition.[2]

Minimal invasive has gradually overtaken open cystolithotomy.[1-2] Post-operative issue is a great concern, especially in patients with socio-economic problems. The percutaneous technique decreases the duration of the procedure.[2] The studies showed promising results of percutaneous cystolitholapaxy (PCCL).[2-3]

CASE(S) PRESENTATION

A 45-year-old male patient, complaining of dysuria, frequent voiding, and persistent hematuria, was admitted to our urology clinic. He fulfilled major depressive disorders criteria. He has diabetes

mellitus on medications but remained uncontrolled. Ultrasonography showed a giant bladder stone with severe bilateral hydronephrosis was revealed. Abdominal NCCT discovered 8.8 cm x 7.2 cm bladder stone (Figure 1). His routine blood analysis showed leukocytosis (15.000/mm^3). His urinalysis showed abundant red blood cells (RBC) and white blood cells (WBC). Impaired renal functions were also noted.

Diabetes, lack of personal hygiene, and improper wound care seem to be our most significant concerns to perform open cystolithotomy. We put aside the choice of transurethral litholapaxy due to the tediously time-consuming procedure, risk of urethral injuries, and impaired renal functions. We encouraged the patient and family to undergo the PCCL procedure.

A 26-year-old male patient presented to our clinic with intermittent hematuria and schizoid personality disorders. The family member escorting him was his older brother. The patient seemed unable to describe his complaints despite the intermittently visible hematuria. We performed ultrasonography and found a giant bladder stone with bilateral hydronephrosis. His routine blood counts show mild anemia of 10.2 g/dL and mild leukocytosis. Elevated urea (109) and creatinine (4.5 mg/dL) was found. Urinalysis showed abundant RBC and 10-20 WBC/HPF.

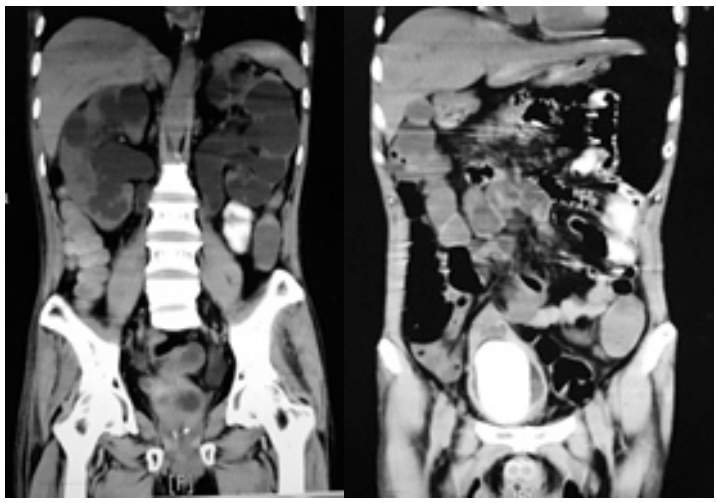

Figure 1. NCCT of Case I. Coronal NCCT of Case I revealed an 8.8 x 7.2 cm bladder stone with bilateral severe hydronephrosis.

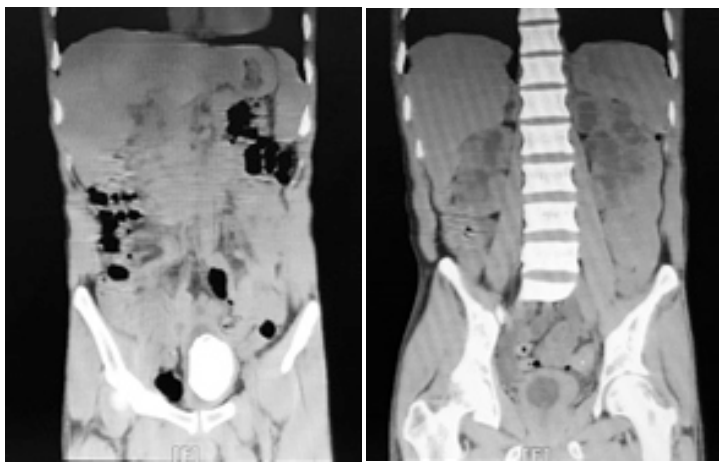

Figure 2. NCCT of Case II. Coronal NCCT of Case I revealed a 7.0 x 5.8 cm bladder stone with bilateral hydronephrosis

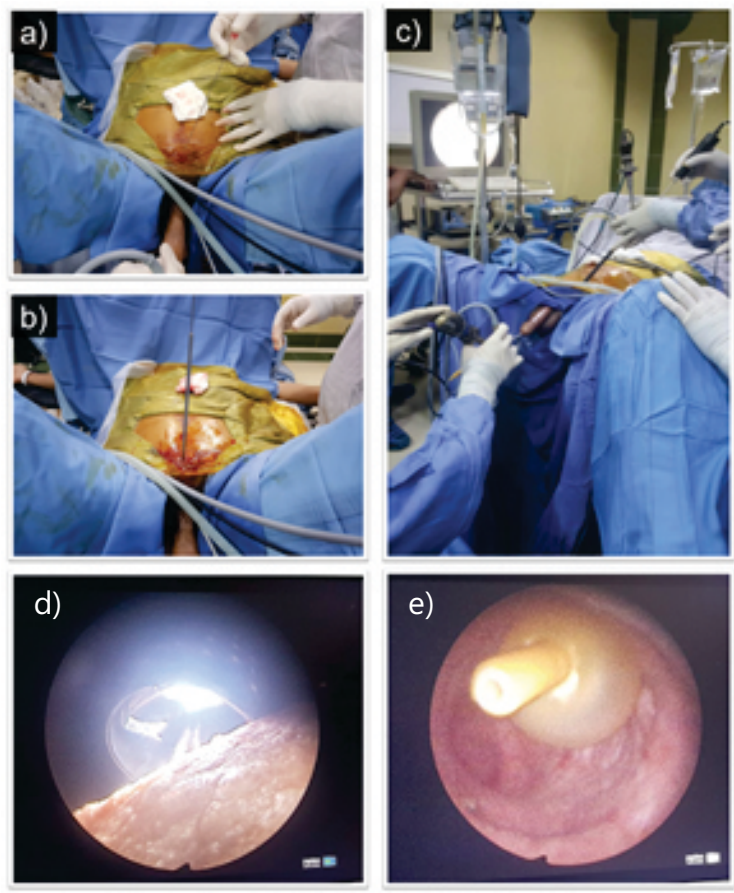

Figure 3. Percutaneous Cystolitholapaxy. a) Bladder puncture (cystoscopy guided). b) Puncture side dilation. c) Stone fragmentation with nephroscope complex units. d) Transvesical stone fragmentation, visualization via transurethral cystoscopy. e) Suprapubic foley catheter was left indwelling for 1 day.

We doubted the patient's understanding and lack of self-care despite his accompanying family member. We predicted that wound care and prolong indwelling catheters would be problematic. Due to these issues, we decided to perform a PCCL.

Spinal anesthesia was used, and prophylaxis antibiotic was given in both patients. Pre-procedural cystoscopy showed severe bladder trabeculation. Bladder puncture and dilation were performed under cystoscopy guidance. Stone fragmentation through transurethral and percutaneous lithotriptors was performed simultaneously. We used transurethral pneumatic lithotriptors through 17F urehtro-cystoscope in conjunction with suprapubic amplatz ultrasound lithotriptors through a nephroscope. A 30F amplatz sheath was used.

No fluoroscopy was involved. Stone fragments were evacuated while maintaining continuous irrigation through the transurethral cystoscope channel. Both operative times were less than 1 hour (58 and 32 mins). The suprapubic catheter was left indwelled for one day, and the patients were discharged on the third day without any complications (Figure 3).

DISCUSSION

We presented two cases of giant bladder stones that occurred in rural areas of Lubuk Pakam, Indonesia. The lack of knowledge, socio-economic problems, and concomitant lack of self-care are the problems in this area. Post-operative issues such as prolonged hospitalization, improper wound care, and urinary leakage become our greatest concerns to perform open surgery. The patients tend to be loss to follow up and not fully attached to the scheduled clinical visit. Thus, significant postoperative morbidity was expected.

The core problem with transurethral large bladder stones removal is the urethral manipulations

with large instruments needed for stone fragmentations and removal. Prolonged duration is also believed to increase the risk of urethral injury.[2] Since the uniqueness of our bladder stone cases was their single giant size in nature, the transurethral stone removal approach would significantly jeopardize the urethra.

The percutaneous approach has altered the therapeutic need for open surgery.[3-6] The procedure is mainly achieved by percutaneous suprapubic amplatz insertion, so larger instrument can approach the stone without manipulating the urethra. Good results have been reported despite the small studies size. There are various studies included that showed 89-100% success of PCCL with larger stones and shorter operative time.[7]

A prospective case series found that the operating time for stone removal was significantly less (20.04 ± 5.87 vs. 43.23 ± 10.6 mins) than the transurethral approach despite its larger stone burden (56.7 ± 8.6 vs. 43.1 ± 7.7 mm) and urethral stricture did not occur.[8] This study also supported by Tugcu et al. which found shorter percutaneous pneumatic stone removal duration (22.6 ± 4.9 vs 39.8 ± 11.6 mins) even with larger stones (48.5 ± 4.4 vs 29.8 ± 3.5 mm).[9] To our knowledge, the randomized comparative study is still unavailable.[2,7,9,10] Demirel et al. performed pneumatic PCCL in 42 neurologic bladder patients with large bladder stones (55 (40-100)) and showed an alternative safe road to be considered.[10] A prospective study of Metwally et al. showed that PCCL under cystoscopic control and without fluoroscopy seems to be safe and effective with 100% stone-free rate and no postoperative adverse events recorded.[3] With the above considerations, we decided to perform PCCL on our patients.

We performed a cystoscopic guided suprapubic puncture and dilations followed by 30F amplatz insertion. The challenge was in performing the puncture itself since both patients have stones that filled the whole bladder cavity with poor bladder compliance, high-grade trabeculations, and even bladder sacculations. However, it can be performed safely under cystoscopic guidance. We used two monitors, so a combination of transurethral pneumatic with suprapubic ultrasound-pneumatic lithotripsy can be easily performed simultaneously by two urologists. The small urethral cystoscope and shorter duration of operation were expected to lower the urethral injury. We successfully removed the stones without residual stone fragment in under 1 hour. No intraoperative adverse event was noted. Due to poor bladder anatomical and physiological considerations, we left an indwelling 16F catheter for one day. Both patients have no morbidity on follow-up.

CONCLUSION

We performed PCCL with simultaneous transurethral fragmentation in giant bladder stone cases presenting with comorbidities of impaired renal functions and mental illness. We faced no significant intra- and post-operative issue. This technique, or its modified approach, is considered safe and applicable in our conditions.

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