

Endourology

Simultaneous transurethral bipolar enucleation of the prostate, supine ultrasound-guided percutaneous nephrolithotomy and open cystolithotomy: A feasible and safe approach

Ka Lun Lo^{a,*}, David Leung^a, Joseph K.M. Li^a, Siu King Mak^a, Hon Ming Wong^a, Chi Fai Ng^{a,b}

^a Division of Urology, North District Hospital, New Territories East Cluster Urology Unit, Prince of Wales Hospital, Shatin, Hong Kong, China

^b SH Ho Urology Centre, Department of Surgery, The Chinese University of Hong Kong, China

ARTICLE INFO

Keywords:

Transurethral bipolar enucleation of the prostate
Supine ultrasound-guided percutaneous nephrolithotomy
Open cystolithotomy
Simultaneous 3-team approach

ABSTRACT

Management of the coexisting hard renal pelvic stone, large urinary bladder stone and benign prostatic hyperplasia is not common which can be difficult.

Here we reported a case of a 70-year-old Asian male who presented with 1.5cm renal pelvic stone, 5cm large bladder stone and 96 cc benign enlarged prostate, which were managed by simultaneous transurethral bipolar enucleation of the prostate (BipoLEP), supine ultrasound-guided percutaneous nephrolithotomy (PCNL) and open cystolithotomy.

Simultaneous transurethral BipoLEP, supine ultrasound-guided PCNL and open cystolithotomy are feasible and safe, with the advantage of minimizing the patient's operation and anesthesia time.

Introduction

Coexisting renal pelvic stone, large urinary bladder stone and benign prostatic hyperplasia in one patient is uncommon which can be complicated. Here we reported a case who presented with 1.5cm renal pelvic stone, 5cm bladder stone and 96 cc benign enlarged prostate, which were managed by simultaneous transurethral bipolar enucleation of the prostate (BipoLEP), supine ultrasound-guided percutaneous nephrolithotomy (PCNL) and open cystolithotomy.

Case presentation

A 70-year-old Asian male with a medical history of diabetes mellitus, hypothyroidism and hyperlipidemia presented with gross hematuria and lower urinary tract symptoms. Plain radiography suggested he had one 1.5 cm right renal stone and one 5cm bladder stone (Fig. 1). Non-contrast computed tomography (NCCT) confirmed the presence of a 1.5cm right renal pelvic stone with hydronephrosis and the Hounsfield unit (HU) was 1401. The 5cm bladder stone was also confirmed by the NCCT scan. His prostate was also enlarged with intravesical extension. Flexible cystoscopy showed the bladder stone and the vascular trilobed enlarged prostate with intravesical extension. Prostatic urethral channel

was compromised. Transrectal ultrasound (TRUS) showed enlarged prostate of 96 cc. Uroflowmetry showed the obstructed pattern with maximum flow rate only 4.4ml/s and post-void residual urine 134ml.

After discussion with the patient of different treatment options, he decided for simultaneous transurethral BipoLEP, supine ultrasound-guided PCNL and open cystolithotomy under spinal anesthesia. He was given one dose of 1.2 g co-amoxiclav on induction of the operation. Patient lied on the Lloyd Davis position. Three-team approach was employed. For the BipoLEP part, thick loop resectoscope (Karl Storz AUTOCON® III 400 system) was used. Enucleation time was 30 minutes. The enucleated adenoma was pushed to the urinary bladder and planned to be removed en bloc through the cystostomy during bladder stone retrieval.

For the open cystolithotomy part, 6cm suprapubic abdominal skin incision and cystostomy were done for complete removal of the bladder stone and enucleated prostate adenoma. Cystostomy was closed with 2/0 V-Loc and Vicryl in 2 layers. Negative leak test was confirmed after bladder instillation of 250ml methylene blue solution. Complete hemostasis was ensured. Urethral Foley catheter was inserted. No bladder irrigation was required.

Simultaneous supine PCNL part was performed by another surgeon with ultrasound-guided upper-pole puncture. One-step tract dilatation

* Corresponding author.

E-mail addresses: lokulun@surgery.cuhk.edu.hk (K.L. Lo), davidleung@surgery.cuhk.edu.hk (D. Leung), josephli@surgery.cuhk.edu.hk (J.K.M. Li), maks@ surgery.cuhk.edu.hk (S.K. Mak), hmwong@surgery.cuhk.edu.hk (H.M. Wong), ngcf@surgery.cuhk.edu.hk (C.F. Ng).

<https://doi.org/10.1016/j.eucr.2020.101364>

Received 21 July 2020; Received in revised form 27 July 2020; Accepted 28 July 2020

Available online 29 July 2020

2214-4420/© 2020 The Authors.

Published by Elsevier Inc.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



Fig. 1. Plain radiography showed one 1.5 cm right renal stone and one 5 cm bladder stone.

using a 18Fr fascial dilator with sheath was done. 18Fr mini-nephroscope (Wolf Miniature Nephroscope system®, Germany) was used. Complete stone clearance was performed using Lithoclast. Right double-J ureteric stent was inserted antegradely and the position was confirmed endoscopically.

Total operation time was 87 minutes. Specimens of the renal pelvic

stone and enucleated prostate adenoma were sent for stone analysis and histology respectively (Fig. 2). Postop radiography confirmed complete stone clearance (Fig. 3). He resumed full diet on postop day 1. He was discharged with urethral Foley catheter on postop day 2.

Cystogram was performed one week after surgery and confirmed no contrast extravasation with widely patent prostatic fossa. Right double-J and urethral Foley catheter were then removed. The suprapubic wound

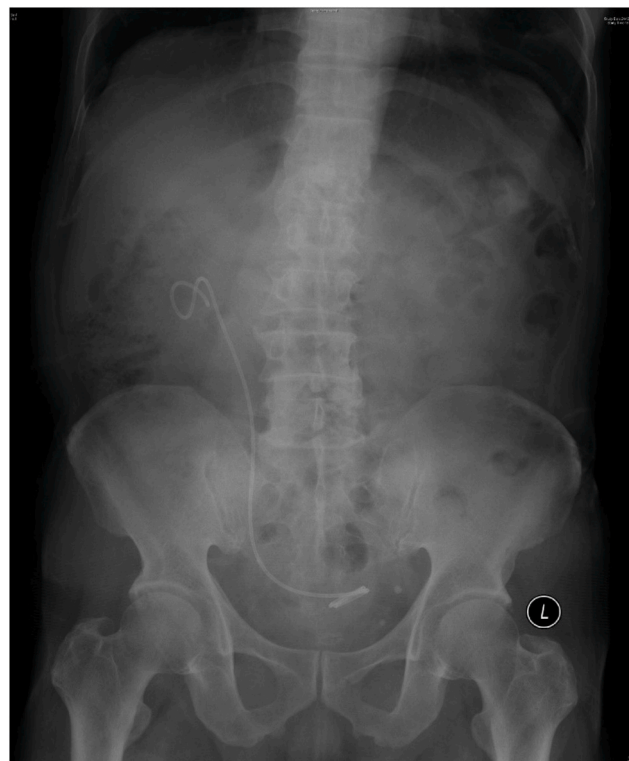


Fig. 3. Postop radiography confirmed complete stone clearance.

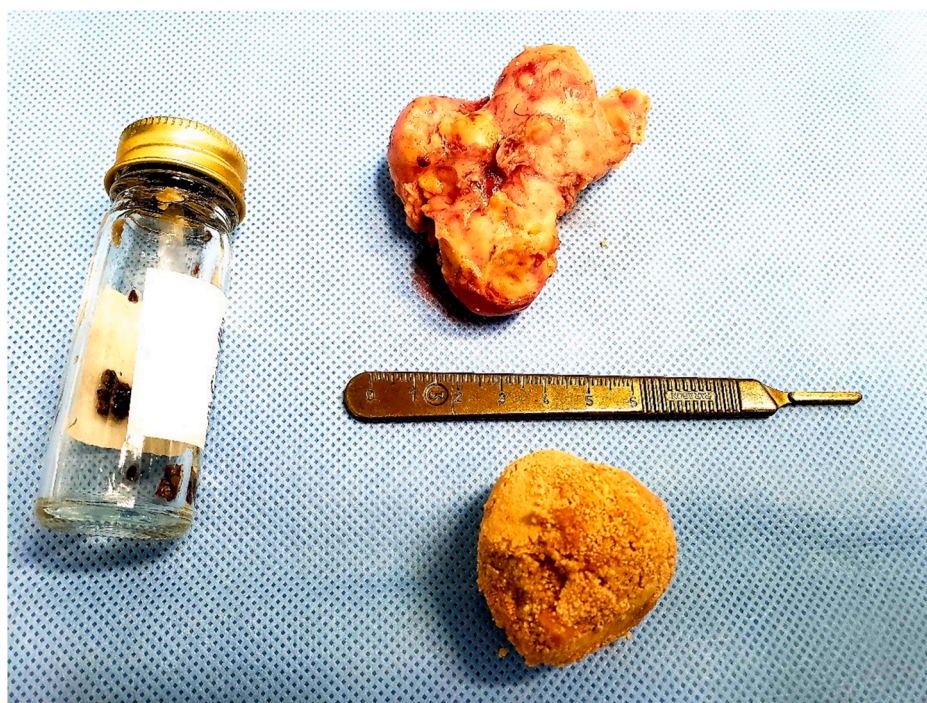


Fig. 2. Specimens of renal pelvic stone, bladder stone and enucleated prostate adenoma.

was healed. He did not complain any postop urinary incontinence. Histology of the enucleated prostatic adenoma was benign nodular hyperplasia. Renal pelvic stone composition was 100% calcium oxalate monohydrate.

Discussion

Renal stone, urinary bladder stone and benign prostatic hyperplasia are common diseases. However, the incidence of these coexisting diseases was not documented in the literature. Report of simultaneous transurethral BipoLEP, supine ultrasound-guided PCNL and open cystolithotomy was not published in the literature neither. For endoscopic enucleation of the prostate (EEP), meta-analysis and randomized controlled trials¹ consistently reported similar functional outcomes and complications as compared to the open prostatectomy (OP) for large benign prostatic hyperplasia, whereas it had the advantages of shorter catheter period, hospital stay and less blood transfusion. EEP was an effective and safe minimally invasive option for treating large prostates. In this case, we used the true bipolar system, theoretically reduced the risk of urethral stricture and bladder neck contracture. The advantage of this thick loop resectoscope was the excellent hemostasis effect, particularly good for the EEP, making postop no bladder irrigation possible.²

For this renal pelvic stone, we preferred supine to prone PCNL or retrograde intrarenal surgery (RIRS) as simultaneous transurethral BipoLEP and supine PCNL was possible, but not prone PCNL or RIRS. In one meta-analysis study, though supine PCNL had slightly lower stone clearance rate, it had shorter mean operative time and lower incidence of blood transfusions as compared to prone PCNL.³ Moreover, a systematic review and meta-analysis concluded that the ultrasound-guided

PCNL, without radiation hazard, was as effective as the fluoroscopy-guided PCNL and had lower complication rates.⁴

There was no guideline for the indication of open cystolithotomy. In this case, as the bladder stone and prostate were large, transurethral cystolithotripsy might require secondary session for the BipoLEP due to the prolonged procedure, but the patient would require another regional anesthesia. Simultaneous 3-team approach has minimized his operation and anesthesia time. He could be safely discharged 2 days after the operation.

Conclusions

Management of the coexisting renal pelvic stone, large urinary bladder stone and benign prostatic hyperplasia is not common which can be difficult. Simultaneous transurethral BipoLEP, supine ultrasound-guided PCNL and open cystolithotomy are feasible and safe, with the advantage of minimizing the patient's operation and anesthesia time.

References

1. Lin Y, Wu X, Xu A, et al. Transurethral enucleation of the prostate versus transvesical open prostatectomy for large benign prostatic hyperplasia: a systematic review and meta-analysis of randomized controlled trials. *World J Urol.* 2016;34:1207.
2. Lo Ka Lun, Lim Kevin, Siu Fai MA, et al. The initial clinical experience of a new generation bipolar electrosurgical and morcellator unit for bipolar transurethral enucleation of the prostate. *JLEU.* 2020;3:1.
3. Yuan D, Liu Y, Rao H, et al. Supine versus prone position in percutaneous nephrolithotomy for kidney calculi: a meta-analysis. *J Endourol.* 2016 Jul;30(7): 754–763.
4. Yang YH, Wen YC, Chen KC, et al. Ultrasound-guided versus fluoroscopy-guided percutaneous nephrolithotomy: a systematic review and meta-analysis. *World J Urol.* 2019 May;37(5):777–788.