



Cystoscope guided percutaneous cystolithotripsy in the management of Giant Vesical Calculi: Point of technique

Dr. Aseem Kapadia¹, Dr Deepak Mandloi MBBS MS², Dr Tapan Singh Pendro³, Dr Vibha Khare^{*4}

¹Assistant Professor Department of Surgery LNCT Medical College & Sewakunj Hospital Indore

²Assistant Professor Department of Surgery Sevakunj Hospital & LNCT Medical College Indore

³Associate Professor Department of Forensic Medicine MGM Medical College Indore

⁴Senior Residence Super Specialty Hospital Department of Biochemistry MGM Medical College Indore.

Corresponding Author

Dr Vibha Khare

Senior Residence Super Specialty Hospital Department of Biochemistry MGM Medical College Indore

Email: drvibhakhare@gmail.com

Abstract:

Vesical calculi accounts for 5% of urolithiasis. Various treatment modalities are described to manage vesical calculi like Open cystolithotomy, transurethral cystolithotripsy and percutaneous cystolithotripsy (PCCLT). In the present article, point of technique with its advantages and disadvantages of new innovative procedure of retrograde cystoscopy guided PCCLT has been described. We have performed this procedure in 26 patients and found out to be safe and efficacious technique in managing giant or large vesical calculi.

Keywords: Vesical calculi, Urolithiasis, Treatment modalities, Open cystolithotomy, Transurethral cystolithotripsy, Percutaneous cystolithotripsy (PCCLT), Retrograde cystoscopy

DOI Number: 10.48047/nq.2024.22.2.NQ24024

NeuroQuantology 2024; 22(2):220-224

Introduction:

Vesical calculi accounts for 5% of urolithiasis.¹ Various management modalities have been evolved over years from open cystolithotomy and Cystolitholapaxy to transurethral cystolithotripsy and percutaneous cystolithotripsy. Open cystolithotomy has its own inherent morbidities like large surgical scar, long catheterization, long hospitalization and risk of infection. Percutaneous cystolithotripsy (PCCLT) is one of the best modalities of minimally invasive endourological procedure for the management of giant vesical

calculi.² Usage of cystoscope guidance while performing percutaneous cystolithotripsy is sometimes debatable. In the present article, point of technique of retrograde cystoscopy guided PCCLT has been discussed.

Point of technique:

Armamentarium:

- 19 Fr. Cystoscope sheath
- Puncture needle, Amplantz dilator set with Amplantz sheath
- 20.8 Fr. Nephroscope
- Pneumatic lithotripter



Procedure:

PCCLT is performed in a lithotomy position under regional (Spinal) anesthesia after receiving pre-operative antibiotic. Cystourethroscopy using 19 Fr. sheath is performed to assess the calculus size, number and associated bladder and urethral pathology. Thereafter, bladder was filled with irrigation fluid and percutaneous puncture was made in a suprapubic region and puncture needle is visualized through the cystoscope. Guidewire is then negotiated into the bladder. Tract is then serially dilated under endoscopic guidance up to 24 Fr. After placing the Amplantz sheath of 24 Fr. 20.8 Fr. Nephroscope is passed through the amplantz sheath and stones are fragmented using pneumatic lithoclast. Stone fragments are then retrieved using the grasper. Very small fragments and dust are suctioned. Stone fragmentation, retrieval and suctioning was done under retrograde as well as antegrade cystoscopic guidance. After stone clearance, 18 Fr. Foleys catheter is passed retrogradely into the bladder and suprapubic access site is closed by putting one stitch of silk 2-0. Foley's catheter is then removed on 2nd post-operative day.

Discussion:

Vesical calculus usually forms secondary to bladder outlet obstruction. In some instances, calculi migrate from kidney into the bladder. Stones in later situations are known as primary vesical calculi. Various treatment modality is described in literature for the management of giant vesical calculi like open cystolithotomy, transurethral cystolithotripsy and percutaneous cystolithotripsy.² The objective of all endoscopic procedure is to achieve complete stone free rate with minimal or no complications and shorter convalescence time.³

Percutaneous cystolithotripsy is one of the endoscopic modalities used to manage giant vesical calculi with better visualization and stone fragmentation as compared to other

endoscopic procedures.³ Ahmadina *et al.* in their study found this modality to be more beneficial in treating large bladder stones in children.⁴ In the present study, PCCLT was used in removal of vesical calculi in all age groups. Current article focusses on the innovative technique of simultaneous retrograde cystoscopy while performing PCCLT and its pros and cons.

Advantages:

- Access site puncture and dilatation is endoscopic guidance so risk of injury to posterior bladder wall, ureteric orifices and bladder neck can be avoided.
- Using cystoscope guidance, fragmentation of stone can be done up to a appropriate size of the extent so that it can be retrieved through the amplantz sheath.
- Using cystoscope guidance, mucosal injury can be avoided while grasping the stone fragment and also during suctioning the dusted stone particles (Picture 3).
- As sheath of cystoscope is placed during whole procedure, migration of stone fragments through the bladder neck into the posterior urethra can be avoided (Picture 1).
- The irrigant fluid inflow can be managed from retrograde cystoscope, so that bladder won't get collapsed while stone fragmentation and retrieval. Thus, bladder mucosal injury can be avoided.
- No radiation exposure as procedure is performed under endoscopic guidance and not fluoroscopic guidance.

Disadvantages:

- Two surgeons are required for this procedure one performing retrograde cystoscopy and another doing PCCCLT (Picture 1).
- Two light sources and camera station will be required.





Picture 1: Two surgeons performing the procedure with full armamentarium.

Picture 2: Endoscopic view of giant vesical calculus.

Picture 3: Endoscopic view of stone fragment grasped with grasper avoiding bladder mucosal injury.

223

We have performed cystoscope guided PCCLT in 26 patients of all age groups with better visualization, stone fragmentation and retrieval as compared to PCCLT performed without retrograde cystoscope. This procedure was performed in a solitary giant vesical calculus largest of size 5 cm to multiple calculi as high as 19 in number.

As injury to posterior bladder was not observed in any case because whole procedure was performed under retrograde endoscopic view, risk of bladder perforation can be avoided. Hematuria was observed in only two cases which also got subsided in 4-6 hours post-operatively. Risk of hematuria was minimal as injury to bladder mucosa can be circumvented. Injury to ureteric orifices and bladder neck was not observed in any case. There was no case with residual vesical calculus and any calculus in posterior urethra.

Retrograde endoscopic guided PCCLT is found to be safe and efficacious technique in managing giant vesical calculi.

Conclusion:

Retrograde cystoscopy guided PCCLT is safe, efficacious technique with minimal morbidity and shorter convalescence in the management of giant vesical calculi. Of course, it requires larger Operation room and armamentarium, it should not be of any concern in a tertiary care center. To conclude, cystoscopy guided PCCLT can be considered as preferred approach in the management of giant vesical calculi.

References:

1. Schwartz BF, Stoller ML. The Vesical calculus. Urol Clin North Am. 2000;27:333–46.
2. Maheshwari PN, Oswal AT, Bansal M. Percutaneous cystolithotomy for vesical calculi: a better approach. Tech Urol. 1999;5:40–2.
3. Kamal Jeet Singh and Jaspreet Kaur. Comparison of three different endoscopic techniques in management of bladder calculi. Indian J Urol. 2011 Jan;27(1):10-3. doi: 10.4103/0970-1591.78402.
4. Ahmadnia H, Younesi Rostami M, Yarmohammadi AA, Parizadeh SM, Esmaeili



M, Movarekh M. Percutaneous treatment of bladder calculi in
5. children: 5 years experience. Urol J. 2006;3:20–2.

