

PCNL (Percutaneous Nephrolithotomy): First Year Experience

Qazi Fasihuddin, Mubasher H. Turi, S. Hanif

Department of Urology and Transplantation, Jinnah Postgraduate Medical Centre, Karachi.

Introduction

In the modern era almost all renal calculi can be treated with minimally invasive or non invasive techniques i.e., percutaneous nephrolithotomy (PCNL) and Extra corporeal shockwave lithotripsy (ESWL).¹ For stone more than 2.5 cm in size, results of PCNL are better than ESWL.^{2,3} With advancing technology, PCNL is being done successfully even in paediatric urolithiasis, pelvic ectopic kidney, morbidly obese patients, calyceal diverticular calculi, upper pole calculi and lower pole calculi which cannot be removed with ESWL.³⁻⁵ Some centres are also practicing minipercutaneous techniques with smaller nephrostomy port while tubeless PCNL is also under practice in some centres.^{6,7} PCNL is recommended for complete stone situation as in ESWL failure and often combined with it.⁸ The purpose of this study is to share our experience of PCNL and to discuss the selection criteria, limitation of the procedure, and utilization of different options available during the procedure in order to reduce the complications.

Patients, Methods and Results

Twenty five patients with mean age of 35±15 years, with 17 male and rest females were subjected to PCNL. Investigations like ultrasonography, intravenous urography and renal scan were done where indicated along with other relevant supportive tests. General anaesthesia was given in all the patients. Fluoroscopic antegrade approach was adopted. With patient in lithotomy position an open ended 5Fr ureteric catheter was passed and secured to a foleys catheter, allowing injection of contrast material to opacify and distend the collecting system. With patient in prone position access was gained to the collecting system via suitable calyx, dilation of the tract over a .032-inch guide wire to 30 Fr allowed insertion of an amplatz sheath through which rigid nephroscope was passed. Fragmentation of calculi was performed using pneumatic and ultrasound probes. Red rubber 16 Fr catheter was used in all cases as nephrostomy. Ureteric stenting was done at the end of the procedure. Nephrostomy tube was taken out on the first postoperative day after clamping for few hours and couple of hours later stent was removed. In 22 patients procedure was successfully carried out. Clearance of stone was highly dependent on stone location. Stones in renal pelvis had a high stone clearance rate (Table). Residual

stones were treated with ESWL. Three patients required pyelolithotomy; two due to excessive bleeding and in one there was tract access failure. Urosepsis was the main complication occurring in 3 (12%) patients while urinary fistula wound infection and residual ureteric stone occurred in 1(4%) patient each. All were treated successfully.

Table. Location of stone and average stone clearance.

Stone location	Pelvis only	Pelvis+one calyx	Pelvis+two calyces	Pelvis+three calyces
No. (%)	6 (27.2)	12 (54.5)	3 (13.5)	2 (9)
Average stone clearance	100%	80%	>60%	>60%

Comments

The goal of surgical stone management is to achieve maximum stone clearance with least morbidity to the patient.⁹ For larger stone burden ESWL is often used in combination with PCNL (sandwich therapy). Stone free rate with PCNL is higher than ESWL.¹⁰ PCNL is preferred choice for cystine stones as these are hard and have a high recurrence rate. PCNL may be less expensive than anatomic nephrolithotomy, requires a shorter hospital stay and allows earlier return to work. In our experience with PCNL, pelvic stones were most easy to remove. Stones with extension into calyces were difficult to remove completely. Thus the advent of percutaneous procedures has significantly reduced the morbidity of previously used surgical procedures. We have found this modality in combination with ESWL very successful and hope that improvement in learning curve will lead to better results.

References

1. Li MK, Wong MY, Toh KL, et al. Percutaneous nephrolithotomy- results and clinical experience, *Ann Acad Med Singapore* 1996;25:683-6.
2. Wong MY. Evolving technique of percutaneous nephrolithotomy in a developing country: Singapore General Hospital experience. *J Endourol* 1998;12:397-401.
3. Nguyen TA, Belis JA. Endoscopic management of urolithiasis in the morbidly obese patients. *J Endourol* 1998;12:33-5.
4. Donnellan SM, Harewood LM, Webb DR. Percutaneous management of caliceal diverticular calculi: technique and outcome: *J Endourol* 1999;13:63-8.
5. Stening SG, Bourne S. Supracostal percutaneous nephrolithotomy for upper pole caliceal calculi: *J Endourol* 1998;12:359-62.
6. Jackman SV, Docimo SG, Cadeddu JA, et al. The "mini-perc" technique: a less invasive alternative to percutaneous nephrolithotomy. *World J Urol*

1998;16:371-4.

7. Goh M, Wolf TS Jr. Almost totally tubeless percutaneous nephrolithotomy: further evolution of the technique. *J Endourol*1999;13:177-80.
8. Qureshi. K, Oakley N, Hastic K. Management of urinary tract calculi. *Surg Int* 2003;60:85-90.
9. James E, Lingeman DA, Lifshitz AP, et al. Surgical management of urinary lithiasis. *Campbell's Urology* .8th edition. Philadelphia: Saunders 2002, pp.3361-3438.
10. Cass AS. Extracorporeal shockwave lithotripsy or percutaneous nephrolithotomy for lower pole nephrolithiasis? *J Endourol*1996;10:17-20.