

## Efficacy and Safety Of Per Cutaneous Nephrolithotomy: A Single Center Experience

Yogesh Kalra, B.Natrajan

(Department of urology, Meenakshi medical college/ MAHER University, Tamil Nadu, India)

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### **Abstract:**

**Aim** -To evaluate the efficacy, safety and major and minor complications of percutaneous Nephrolithotomy (PCNL)

**Methodology:** A total of 100 per cutaneous nephrolithotomies were done at meenakshi medical college and research institute, Kanchipuram, Tamil nadu, India from august 2013 to april 2015. Stone parameters, PCNL complications, and stone-free rate were evaluated. Complications were classified by the modified Clavien grading system.

**Results:** Complications were seen in 26 patients (26%). Overall stone-free rates were 90%. According to the modified Clavien classification, grade I, II, IIIa complications were observed in 15 (50%), 6 (20%), 5 (16.66%) patients, respectively. Transient peri-nephrostomy catheter urine leakage (n=6) was the most common grade I complication, followed by transient fever >38° (n=5) and sepsis (n=4)

Blood transfusion was required in 6 patients (20%) grade II

Post operative ileus was seen in 5 patients (16.66%) which required ultrasonography grade IIIa

No grade IIIb, IVa, IVb and V complications were seen.

Maximum complications occurred in patients with staghorn stones.

**Conclusions:** Percutaneous nephrolithotomy is an effective and safe procedure and has a low overall complication rate in experienced hands.

**Keywords:** ESWL-Extracorporeal shock wave lithotripsy, PCNL-Per cutaneous nephrolithotomy

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### I. Introduction

Numerous procedures are now available for the management of urinary stones. For the management of upper urinary calculi, the method of dilating the tract after percutaneous renal puncture to specifically remove urinary calculi was first established in 1976 by Fernstrom and Johansson.

Today, this procedure should be the first option for the treatment of single large or multiple renal stones and those in the inferior calyx.

Percutaneous stone removal was suggested as the first line treatment option for the management of staghorn calculi by the American Urological Association Nephrolithiasis Clinical Guidelines panel.

PCNL has been advised for the treatment of large, hard, or infected stones, obstructive stones, and extracorporeal shock wave lithotripsy (SWL) failure.

Although percutaneous renal surgery is less invasive than an open procedure, complications may occur. Percutaneous nephrolithotomy is a successful, less invasive surgery (> 90%) at the cost of greater complications (> 10%). There are some complications that may be predictable or unpredictable, such as hemorrhage, collecting system injuries, contiguous organ injuries, intra-operative technical complications, hypothermia, fluid overload, sepsis, stricture formation, nephrocutaneous fistula, renal loss, and death. Recent attempts to report complication rates of PCNL have focused on stratifying them by severity by use of the modified Clavien grading system.

#### **The modified Clavien grading system.**

**Grade I-** The presence of any deviation from the normal postoperative course

**Grade II-** Management that includes not more than intravenous medications, total parenteral nutrition, enteral nutrition, or blood transfusion

**Grade III-** Complications requiring surgical, endoscopic, or radiologic intervention

**Grade IIIa** Complications that require intervention not under anesthesia

**Grade IIIb-** Complications that require intervention under anesthesia

**Grade IV-** Complications that are life-threatening conditions requiring intensive care management

**Grade V-** Complications that cause the death of the patient.

In this study, we evaluate the efficacy, safety and major and minor complications of percutaneous nephrolithotomy (PCNL).

## **II. Aims And Objectives**

1. To study the efficacy of percutaneous nephrolithotomy.
2. To study safety of per cutaneous nephrolithotomy.
3. to study the complications related to per cutaneous nephrolithotomy and grade them according to modified Clavien classification.

## **III. Material And Methods**

A total of 100 per cutaneous nephrolithotomies were done at Meenakshi Medical College and Research Institute, Kanchipuram, Tamil Nadu, India from August 2013 to April 2015. Stone parameters, PCNL complications, and stone-free rate were evaluated. Complications were classified by the modified Clavien grading system.

### **It was a prospective study.**

Serum levels of electrolytes, creatinine, and hemoglobin were recorded and intravenous urography data were evaluated. A single endourologist had performed all of the PCNLs.

Single-stage PCNL was performed in all the patients as the standard procedure. The kidney was punctured under fluoroscopy guidance as standard. Depending on the existence of hydronephrosis, the working tract was dilated using Alken dilators or one-shot technique.

Nephroscopy was done with rigid nephroscope. Pneumatic devices (Swiss LithoClast Master) were used for lithotripsy using a standard nephroscope (26 F). For removal of stone fragments, suction irrigation device and/or grasping forceps were used. Stone fragments were retrieved with 3-pronged grasping forceps. Fluoroscopy and contrast nephrography were done to evaluate the stone-free status at the end of the operation. The number and type of access depended on the size of the treated stones (staghorn stone versus single pelvic stone) and localization (upper or lower pole).

### **Postoperative Care**

At the end of the procedure, a 22 or 24 F Foley catheter was used as a nephrostomy tube. An antegrade nephrography was carried out 24 to 48 hours after the procedure. The tube was removed if no extravasation or retained calculi were present. On the first postoperative day, all the patients had complete blood count. Postoperative kidneys, ureters, and bladder (KUB) x-ray was routinely done in all the subjects. Symptoms and KUBs were used to evaluate the complications and stone remnants, respectively.

## **IV. Results**

Complications were seen in 26 patients (26%). Overall stone-free rates were 90%. According to the modified Clavien classification, grade I, II, IIIa complications were observed in 15 (50%), 6 (20%), 5 (16.66%) patients, respectively.

Transient peri-nephrostomy catheter urine leakage (n=6) was the most common grade I complication, followed by transient fever  $>38^{\circ}$  (n=5) and sepsis (n=4).

Blood transfusion was required in 6 patients (20%) grade II.

Post operative ileus was seen in 5 patients (16.66%) which required ultrasonography grade IIIa.

No grade IIIb, IVa, IVb and V complications were seen.

Maximum complications occurred in patients with staghorn stones.

Complete stone clearance was reported in 95 cases and post operative x ray KUB/fluoroscopy were taken to judge stone free rates in the study.

Out of total hundred patients there were 30 cases of staghorn stones out of which complications occurred in 18 cases (60%). 6 cases required blood transfusion, 4 patients had sepsis, 4 patients had ileus, 4 patients had transient fever.

In non staghorn cases (n=82) total 8 cases were seen with minor complications (9.75%).

## **V. Conclusion**

Percutaneous nephrolithotomy is an effective and safe procedure and has a low overall complication rate in experienced hands. The PCNL complications were related to stone burden, stone location, the type of access, and finally, surgical expertise and equipment.

### References

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