



Research Article

ANALYSIS OF CALYCEAL PUNCTURES AND STONE CLEARANCE IN PCNL -OUR EXPERIENCE

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ABSTRACT

Percutaneous nephrolithotomy is a minimally invasive procedure done in renal calculus patients with stone size more than 2 cm. In this study we have observed the various outcomes especially stone clearance and need for ancillary procedures in upper, middle, lower calyceal punctures. In our study 216 cases who underwent Percutaneous nephrolithotomy in our institute from 2011 to 2018 were retrospectively analysed. The calyceal approach, number of punctures, residual stones are noted. Residual stones are seen in 22 cases of staghorn and multiple calyceal stones. These patients were subject to Extracorporeal shockwave lithotripsy (12)/relook Percutaneous nephrolithotomy (7)/conservative management(3).

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INTRODUCTION

Large renal stones like staghorn calculus, multiple pelvic and calyceal calculus pose a challenge to urologist since the PCNL procedure could not clear all the stones in standard lower calyx puncture entry. They need multiple calyceal punctures, subcostal upper calyx punctures, ancillary ESWL, relook PCNL. There is increased incidence of bleeding and infection due to multiple punctures. Still there are residual calculus following multiple calyceal punctures. Clinically insignificant residual fragments (CIRFs) are described as asymptomatic, noninfectious and nonobstructive stone fragments (≤ 4 mm) (Here we share our experience in managing large renal stones.

MATERIALS AND METHODS

All the patients are evaluated with Hemogram, serum uric acid, calcium, renal function test, x-ray KUB, CT KUB, IVU is done if needed. Type of calyceal puncture-upper, middle, lower. number of calyceal punctures 1, 2, or all calyces was recorded. Post operatively follow up Xray, KUB, USG KUB is done in all patients to confirm stone clearance. In radiolucent stones CTKUB is done.

RESULTS

The stone patients are stratified into staghorn calculus-36(16.6%), pelvic and calyceal calculi-124(57.4%), pelvic ureteric junction calculus-21(9.7%), calyceal calculus-35(16.2%).

The type of puncture, supine (2) or prone position (214) supracostal (12) or infracostal puncture (204) upper calyx (12-5.6%) middle calyx(33-15.2%) lower calyx(126-58.33%) lower and middle calyx(4-1.9%) all calyces(22-10.1%) upper and lower calyx(19-8.7%). Residual stones seen in 22 patients-14 were staghorn calculus and 8 were multiple calyceal calculus. Additional procedures needed in 19 patients. 3 patients were managed conservatively with drugs and hydration 7 patients underwent relook PCNL 12 patients were subjected to ESWL..

DISCUSSION

Out of 216 patients who underwent surgery residual stones are thoroughly studied because it gives rise to two major problems namely regrowth and recurrent urinary tract infection [7]. The residual stones may pass spontaneously; remain silent with no growth, become symptomatic with pain, haematuria, infection and obstruction or act as a nidus and increase in size. Residual stones can be classified according to their treatment into [1] > 6-7 mm → active removal < 4-5 mm (symptomatic) → active removal < 4-5 mm (asymptomatic) → reasonable follow up(11). 22 patients required secondary procedures for stone clearance and the rest of the patients were managed successfully in the first surgery itself using single or multiple puncture technique. The success rate of SWL (no identifiable stone after 3 months) was significantly higher and no residual stones seen on follow up(12) All the stones are sent for stone analysis and patients are given dietary advice accordingly.

CONCLUSION

PCNL is the procedure of choice in large stone burden and reasonable clearance is achieved by appropriate technique thus

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avoiding open surgical procedures. Residual stones could be effectively cleared using ancillary procedures.

Table 1 Stone Pattern & patient position

Stone pattern	
Staghorn	36(16.6%)
Pelvic & calyceal calculi	124(57.4%)
Pelvi Ureteric Junction calculi	21(9.7%)
calyceal calculus	35 (16.2%)
Supine pcnl	2
Prone pcnl	214

Table 2 Puncture Approach relation to 12th Rib

Calyceal puncture	
Infracostal	204
supracostal	12

Table 3 Calyceal Puncture

Calyceal access	
Lower calyx	126 (58.33%)
Mid calyx	33 (15.2%)
Upper calyx	12 (5.6%)
Lower and middle calyx	4 (1.9%)
Lower and upper calyx	19 (8.7%)
All calyces	22 (10.1%)

Table 4 Residual Stone and Additional Procedures

Additional procedures	
Eswl	12
Relook pcnl	7
Conservative Management	2
Residual stones	
Stag horn calculus	14
Multiple Calyceal calculus	8



Figure 1 X-ray KUB showing RT staghorn calculus

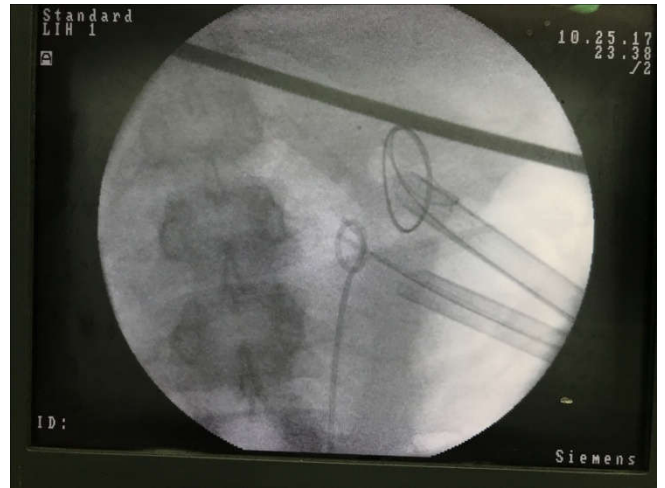


Figure 2 Multiple Calyceal Puncture approach



Figure 3 Residual calculus in inferior calyx following PCNL

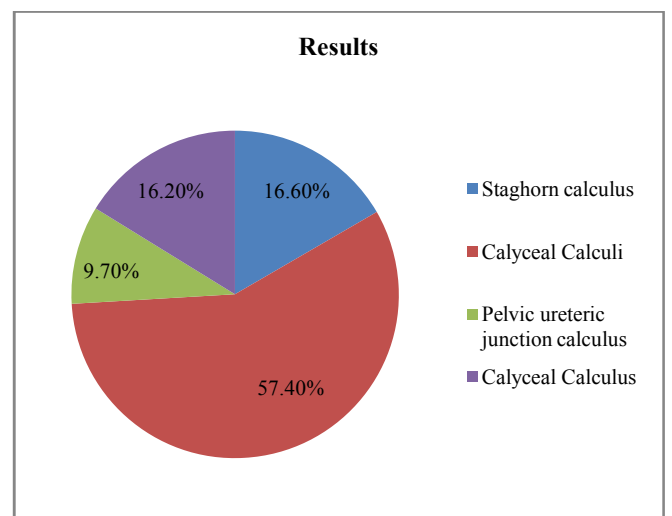


Figure 4 Pie diagram representing stone distribution

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