



Abstract: 875

Effectiveness and Safety of Minimally Invasive Percutaneous Nephrolithotomy in Management of Lower Pole Renal Stones 2cm or Less: A Comparison with Flexible Ureterorenoscopy and Shockwave Lithotripsy



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Introduction & Aim

The best management of lower calyceal stones remains controversial. This study aims to assess the efficacy and complications of minimally invasive percutaneous nephrolithotomy (miniPNL) in lower calyceal stones, and to compare the results with outcomes of flexible ureterorenoscopy and shockwave lithotripsy (SWL) in matched patients.

Patients & Methods

Patients with lower calyceal radiopaque unilateral stones ≤ 2 cm were prospectively enrolled between Feb. 2014 – Jan. 2016, and underwent miniPNL using a semirigid ureteroscope through a 16 or 20-Fr sheath with holmium laser or pneumatic lithotripsy.

Perioperative complications were recorded: postoperative pain (Numeric Rating Scale 0-10), bleeding, fever, hematuria, and extravasation.

Patients were considered stone-free when no stones or residuals < 3 mm were found on non-contrast CT. Stone-free rates (SFR) and complications were compared to two matched cohorts of patients who underwent URS or SWL at the same institution.

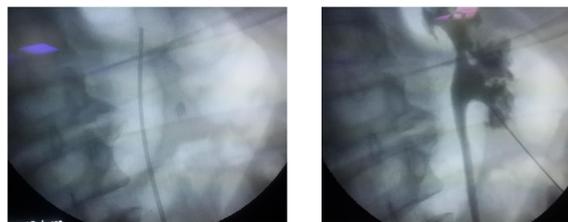
Results

The study included 30 patients aged 22-63 years (mean 39.8) who underwent miniPNL

Pre-operative characteristics:

Mean Age \pm SD (range)	39.8 \pm 1.9 (22-63)
Male:Female	18:12
Mean BMI \pm SD (range)	29.0 \pm 0.5 (24.8-34.8)
Mean Hg \pm SD g/dL	12.8 \pm 0.3 (10.5-16.7)
Mean s. creatinine \pm SD mg/dL	1.03 \pm 0.05 (0.6-1.6)

Stone parameters:



All stones were lower pole radio-opaque stones with size ranging from 10-20 mm in maximal diameter (mean stone size \pm SD 16.1 \pm 1.8 mm). Twenty two patients (73.3%) had single stone while eight patients (26.7%) had multiple stones.

Operative parameters:

Mean operative time \pm SD min	57.8 \pm 4.9 (20-120)
Laser lithotripsy: pneumatic	26 (86.7%): 4 (13.3%)
Tubeless: with PCN	22 (73.3%): 8 (26.7%)
Mean \pm SD hospital stay	2 \pm 0.15 days

Results

Perioperative complications:

Minor complications occurred in 6 (20%) patients in the form of postoperative fever &/or significant pain.

Pain: No – Mild (score 0-3)	24 (80%) patients
Moderate (score 4-6)	6 (20%) patients
Post op fever	5 (16.3%) patients
Significant Hb drop / Transfusion	0 patients

Outcomes compared between miniPNL, URS, and SWL:

Stone-free rate was 93.3% at 1 month and 96.7% at 3 months, with 2 patients requiring an auxiliary procedure (SWL) for residual fragments.

	miniPNL	URS	SWL	P value
SFR at 3 months	29 (96.7%)	29 (96.7%)	17 (56.7%)	<0.001
Auxiliary procedure	2 (6.7%)	1 (3.3%)	11 (36.7%)	0.001

Conclusions

miniPNL is a safe and effective treatment option for lower calyceal stones 2 cm or less, with a high SFR that is comparable to ureterorenoscopy and that is significantly better than SWL.