



MANAGEMENT OF RENAL STONES WITH MINI PERC – AN INSTITUTIONAL EXPERIENCE.

Urology

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ABSTRACT

Standard PNL is known to have higher clearance rates for stones more than 2 cm sizes. However, it is not promoted because of its associated morbidity, especially bleeding in smaller and non-bulky urolithiasis. Miniaturization of the PNL has spawned a new interest in this modality for treating small bulk urolithiasis. We wanted to put forward our experience with mini pcnl in the management of 1-2cm solitary renal stones in western Rajasthan.

KEYWORDS

INTRODUCTION

Percutaneous nephrolithotomy (PNL) has played an important role in urologist's treatment strategies. Shock wave lithotripsy (SWL) provides a low stone-free rate and has a high retreatment rate in stones more than 1.5 cm in size [2, 3]. These issues have led to a renewed interest in PNL for stones measuring 1–2 cm in patients who have failed to respond to SWL or all lower pole stones in which PNL gives better stone free clearance. The major hindrance when considering PNL for nonbulky urolithiasis are the associated morbidities and complications i.e. bleeding. After the advent of newer technique of mini pcnl several short comings of standard PNL have been answered. Helal et al[4] and Jackman et al [5,6] were the pioneers of mini pcnl with a smaller working sheath (12-20 Fr) than the standard PNL.

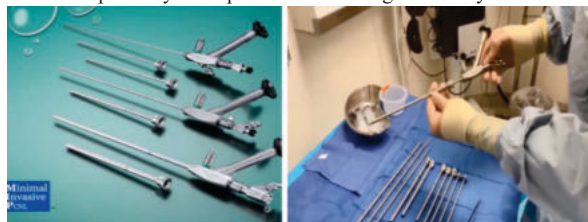
PATIENTS AND METHODS

A total of 60 mini pcnl procedures were performed in 60 patients for renal stones 1–2 cm in size between Jan 2020 to and Jan 2022 in our institute. Maximum length of the stone was determined on a preoperative plain abdominal radiograph. After informed consent patients consenting for the invasive surgical procedure with stone size of 1-2 cm were included in the study. Active urinary tract infection, renal malformation, uncorrected coagulopathy and morbid obese patients were excluded from the study. After general anesthesia, a 5 Fr ureteric catheter was placed transurethrally, selective calyceal puncture, usually at the posterior lower pole calyx, was carried out with 18 gauge needle (cooks). A flexible 0.035-inch guidewire was then inserted into the renal collecting system preferably in the ureter. The access needle was removed and the skin and fascia incised. For mini pcnl, the tract was dilated up to 14Fr-18Fr by fascial dilators (Cook, Inc) in a stepwise manner. Nephroscopy was done by 12/14 Fr miniature nephroscope (Lahme, Richard Wolf, Knittlingen, Germany). Renal stone was fragmented by a Holmium: YAG laser using 200- or 365-µm fibre. At the end of the procedures, a 5.5 Fr double-J stent was placed antegradely. Single percutaneous tract, no perforation of collecting system and no bleeding, complete stone clearance as assessed by intraoperative nephroscopy and fluoroscopy at the end of the procedure were point of consideration for tubeless pcnl (without nephrostomy). In case a tubeless procedure was not planned, a 20 Fr nephrostomy was kept till POD 1. The tube was removed on POD 2. Catheter was removed on subsequent day and patient discharged. X-ray KUB assessed stone free rates in all patients at 1 month follow-up. Clearance was defined as no stone visible on X-ray KUB and all fragments less than 4 mm were considered as clinically insignificant residual fragments.

RESULTS

All patients were compared in terms of gender, mean age, mean body mass index, side of stone and mean stone burden. Radiographic follow-up data at 1-month postoperative visit were available for all patients. One patient in the minipcnl group had residual fragment of size 8 mm in the lower calyx. Holmium laser was the predominant intracorporeal lithotripsy utilized for the minipcnl group. In no case

was it deemed necessary to convert from a minipcnl to a standard PNL. No event of intraoperative bleeding or pelvic injury occurred in any of our cases. An average Hb drop of 0.8 to 0.9 gm% was noted in our series. Hospital stay of the patient on an average was 2 days.



Demography

TOTAL CASES	60
SEX DISTRIBUTION (M:F)	35:25
AGE	10 to 70
BMI(KG/m2)	23.8 +- 2.6

Stone Characteristics

MEAN STONE SIZE (cm)	1.47+-0.3
LATERALITY (LT:RT)	33:27
ACCESS	
UPPER CALYX	7
MIDDLE CALYX	17
LOWER CALYX	36
SITE OF STONE	
PELVIS	16
UPPER CALYX	3
MIDDLE CALYX	6
LOWER CALYX	35

Tract size (Fr)	16.5 fr
NEPHROSCOPE SIZE	14.5 fr
ENERGY SOURCE	
HOLMIUM LASER	60
PNEUMATIC LITHOTRIPSY	0
MEAN OPERATIVE TIME	35+-25
TUBE LESS	60
INTRAPERATIVE COMPLICATION	
PELVIC INJURY	0
BLEEDING	0
FEVER	7
COMPLETE STONE CLEARANCE	98%
HB % DROP	0.8 +- 0.9(gm %)
ANALGESIC REQUIRMENT	55 +-50 (MG TRAMADOL PRN)
HOSPITAL STAY	2 DAYS

DISCUSSION

SWL, PNL and flexible ureteroscopy are the three main modalities for treating non-bulky renal urolithiasis. Lower clearance rate with SWL and high complications associated with the standard PNL were the points limiting its use as surgical procedure for nonbulky solitary renal stones of smaller than 2 cm size. The advent and benefits with minipcnl have overcome the major short coming of standard procedure. With low rates of bleeding [5] and higher stone clearance minipcnl becomes suited procedure of lower polar and SWL resistant stones. Traditionally, PNL requires a 30-Fr nephrostomy sheath for renal access and general anesthesia. The recent development of smaller sheaths suggested that percutaneous nephrostomy tract formation could be performed with minimal damage to the involved renal parenchyma, thereby reducing the procedure related morbidity without diminishing its therapeutic efficacy and by ensuring highest stone clearance rate. Thus further supporting the usage of minipcnl for cases where it was not considered earlier. Stone free rates are the highest with minipcnl and are not offered with any other treatment modality. The stone free rate of 98% and neither of the operated patients requiring blood transfusion in our study supports the literature. Thus minipcnl can be safely and effectively be used for the treatment of solitary renal calculus of smaller sizes.

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