Original Research Paper

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Urology

CLINICAL EXPERIENCE OF THE TUBELESS PCNL USING STANDARD EQUIPMENTS

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ABSTRACT

INTRODUCTION: The standard PCNL comprises nephrostomy tube and Double J stent placed in kidney after the procedure. But nowadays Tubeless PCNL is practised to reduce post-op morbidity and hospital stay. This leads to our study on tubeless PCNL.

MATERIAL AND METHODS: This study conducted in General Surgery Dept of MIMER Medical College, pune, where 22 patients were operated for tubeless PCNL. In the group of 3 patients, no nephrostomy tube or DJ Stent was inserted after removal of the stone fragments . In 19 patients DJ stent was kept. The duration of surgery, intra-op and post-op hematuria, complications ,analgesic requirement and hospital stay were studied.

RESULTS: In this study, mean duration of surgery for Tubeless PCNL was observed around 60 minutes was found. The average hospital stay was found to be 4 days . The post-op morbidity was comparatively less with this procedure. However, there were no statistical difference in blood loss , no major complications or mortality.

CONCLUSIONS: Tubeless PCNL is a safe, economic and procedure, and it can markedly reduce the postoperative analgesic requirements and reduce the hospital stay and costs.

KEYWORDS : nephrostomy tube, DJ Stent, duration of surgery, analgesic requirement, complications

INTRODUCTION

Percutaneous nephrolithotomy (PCNL) is the treatment of choice for renal stones more than 15mm. In current practice following PCNL DJ stent and nephrostomy tube is inserted.

A “Tubeless” percutaneous procedure-one that has no postoperative nephrostomy tube-was initially proposed by Wickham and colleagues.1 The concept was revived by Bellman and colleagues2, with a ureteral stent left in place for a week or two.

Tubeless PCNL is mainly two types

Tubeless PCNL with ureteral stent, where after completion of PCNL only double J stent passed, no nephrostomy tube inserted.

Totally tubeless PCNL i.e.no nephrostomy tube or DJ stent placed after the procedure.

Karami et al3 reported their 5-year experience in 201 patients undergoing tubeless PCNL with only an externalized ureteral catheter, and concluded that it was a safe, effective, and economical option. Similar results were reported by Ashraf Abou-Elela et al.

MATERIAL AND METHODS

This was a study, conducted in the Department of general surgry, MIMER Medical college, Pune, for a period of 6 months in 2018. A total number of 22 cases of tubeless PCNL were studied.pcnl was performed by single urologist using standard 20 fr nephroscope and stone fragmentation done using pneumatic lithotripter,

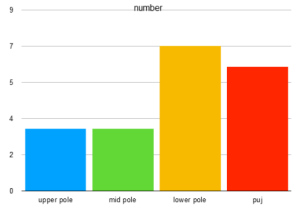
Total patients: 22 patients
Age: 25yrs to 65yrs
Sex: Male: 15 Female: 07
Calculus size: 15mm to 25mm
Location: Pelvis: 08
Upper pole: 03
Mid pole: 03
Lower pole: 07

INCLUSION CRITERIA:

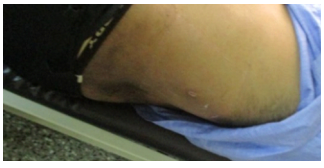
Patients with renal and/or upper uretric calculi of greater than 1.5cm amenable for PCNL.

EXCLUSION CRITERIA:

1) Patient with significant intra-operative bleeding.
2) Patient with infected calculi.
3) Significant injury to the pelvic calyceal system.
4) Patient with stag horn calculus.



S No	Parametre	Values
1	Mean duration of procedure (minutes)	56.4±6.52
2	Bleeding requiring transfusion	0.0
3	Mean Length of hospitalization (days)	2.5±0.93
4	Mean analgesic requirement (tramadol iv)	62.4± 16.8 (mg)
5	Stone free rate	90.91%
6	Mean Procedure cost (rupees)	10000 to 15000
7	Time to return of daily life activities	5.2±0.18



RESULTS

We studied 202cases undergoing tubeless PCNL in our hospital. We divided total cases in to 2 groups. There are 22 patients who underwent tubeless PCNL.

Mean stone burden is 2.0 cms with smallest stone of 1.5cm to largest stone of size 2.5cms. Single tract access was successful in most of the cases.

Mean duration of PCNL was 60 minutes.

No patient required blood transfusion intra or post operatively.

In addition, complications included high fever in 2 patients.

Post-op hematuria in 1 patient settled in 12 hrs.

DJ stent was not kept in 3 patients. Nephrostomy tube was not kept in any of the 22 patients.

DISCUSSION

Since the introduction of PCNL about 30 years ago, continuous efforts have been made to improve the technique in order to decrease trauma to the kidney and the percutaneous tract, and reduce postoperative morbidity, hospital stay and costs. One of the clinically tested modifications is the mini-perc approach that was first reported in pediatric patients.6 This version(mini perc) of PCNL uses 13-20 Fr working sheaths and was soon adapted for adults, resulting in reduced operative time, less postoperative morbidity and shorter hospital stay.7 It did not, however, obviate the need for the placement of nephrostomy tubes. Pietrow et al used a narrower tube (10 Fr instead 22 Fr) and noted greater comfort in the immediate postoperative period without sacrificing safety.8

The concept of a tubeless technique represents a novel alternative in the search to miniaturize the procedure. Bellman et al. reported their initial experience with a series of 50 patients who underwent various percutaneous procedures. Later Limb and Bellman completed 112 successful tubeless procedures, representing almost one-third of all their percutaneous procedures.2 Their Prospective randomized studies designed to compare tubeless vs. mini vs. standard PCNL confirmed the superiority of the tubeless PCNL.

Tubeless PCNL has been a successful procedure even in advanced aged patients. [13,14]

Shah et al. [14] documented superiority of percutaneous nephrolithotomy in terms of patient's satisfaction.

In Our present study, we studied the effectiveness and safety of tubeless PCNL for operative time, postoperative hematuria, hospital stay, and stone-free rate. There was significant reduction in post operative pain, PCN site leakage and analgesic requirement.we used standard size nephroscope 20 fr , stone fragmented with pneumatic lithotripsy

The mean operative time in our study was shorter in the Tubeless PCNL group (59.4min) this difference was not statistically significant.

Ni et al. reported that tubeless PCNL had a reduced operative time versus standard PCNL.

In our study none of the patients required post op blood transfusion similar to the study of Khairy Salem et al. there.9

In studies conducted by Gupta et al and Crook et al there is no statistically significant difference in blood transfusion rates between two groups i.e standard PCNL and tubeless PCNL10

Hospital stay plays an important role in the evaluation of a technique, in our present study it was lower in Tubeless PCNL group was statistically significant. This result was similar to other published studies, such as in the study of Khairy Salem et al. in which the mean (range) hospital stay was 1.7 (1–4) days in the tubeless PCNL group and 2.8 (3–4) days in the Standard PCNL.9

In our present study, the postoperative analgesic requirement (tramadol) in the Tubeless PCNL group was less . This advantage of tubeless PCNL and has also been reported in other studies, such as that of Zhong et al. as their overall results indicated that the tubeless PCNL group had a lesser analgesic requirement.11 In our study Average cost of the procedure for tubeless PCNL was less.

The mean time to return daily activities in our study for tubeless PCNL is 5 days and for standard PCNL it is 10.5 days. Zhong et al. reported that the time for return to normal activity in the totally tubeless group was significantly lower than the standard PCNL group.11

Reference study	N	Mean stone burden	Postoperative drainage	Analgesia requirement	Average Hb drop gm/dl	Stone free rates (%)
Agarwal et al12	101	3.8 cm2	JJs	81.7 mg MP	0.36 gm%	100
Desai et al	10	250	JJs	8.5 mg D	4.2 gm%	-
Feng et al	8	4.4 cm3	JJs	5.25 mg M	-	85.7
Singh et al	30	750mm	JJs	6 mg M, 415 mg D	1.2 gm%	100

CONCLUSION

Our findings demonstrated that tubeless PCNLs can be safely and effectively performed by an experienced endourologist in selective patients.

Tubeless PCNL has an advantage of significantly reduced postoperative pain, cost of treatment and shorter hospital stay.

Complications rate are less with tubeless PCNL and blood transfusion is less when compared with traditional PCNL.We believe that this study will contribute to the further popularization of the tubeless technique for the benefit of the patient and the health care.

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