

Original article:

Are We in Era of Tubeless PCNL? – A Randomized Controlled Trial of ‘PCNL with nephrostomy tube v/s tube less PCNL

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Abstract:

Aim: Our aim was to assess the efficacy, safety, and morbidity of tubeless percutaneous nephrolithotomy (PCNL) and compare it with conventional PCNL. One group patients undergone PCNL with nephrostomy placement (standard PCNL).

Materials & methods: Between Jan 2016 and Dec 2017 ,112 patients undergoing PCNL prospectively evaluated in 2 groups of 56 patients each. One group patients undergone PCNL with nephrostomy placement (standard PCNL). Second group of patients undergone PCNL without nephrostomy tube and D-J stent (TUBELESS PCNL).

Case selection criteria were adequately matched and postoperative outcome was recorded in same way in both groups..

Results: This study demonstrates that percutaneous nephrolithotomy without nephrostomy is a safe and well tolerated procedure in selected patients. We believe that tubeless percutaneous nephrolithotomy may be considered an accepted standard of care for selected cases and it is possible to reserve placement of a nephrostomy tube for specific indications. Length of stay was reduced with no major complications in either group.

Conclusion: A large cohort of patients studied in randomised fashion would prove the advantage making PCNL, a tubeless procedure and real meaning of tubeless would be worth one's effort.

Introduction:

Our aim was to assess the efficacy, safety, and morbidity of tubeless percutaneous nephrolithotomy (PCNL) and compare it with conventional PCNL. One group patients undergone PCNL with nephrostomy placement (standard PCNL). Second group of patients undergone PCNL without nephrostomy tube and D-J stent (TUBELESS PCNL).

Materials & methods:

Between Jan 2016 and Dec 2017 ,112 patients undergoing PCNL prospectively evaluated in 2 groups of 56 patients each. One group patients undergone PCNL with nephrostomy placement (standard PCNL). Second group of patients undergone PCNL without nephrostomy tube and D-J stent (TUBELESS PCNL).

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Of 112 patients five patients were presented with acute renal failure secondary to obstructive uropathy, an initial D.J stenting was done for improvement of renal function and PCNL was subsequently performed.

While comparing the two groups following criteria's were considered to decrease bias

- Duration of post operative haematuria and preoperative and postoperative haemoglobin),
- Complications like urinary leak,perinephricurinoma formation.
- total stone size
- Operative time,
- Hospital stay,
- Postoperative pain,analgesic requirement,
- Estimated blood loss(decrease in haemoglobin measured from
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INCLUSION CRITERIA

- Renal calculi include calyceal calculi, pelvic calculi ,upper uretericcalculi or any of the combination of above.
- All cases of renal calculi who underwent percutaneousNephrolithotomy.

EXCLUSION CRITERIA

- Patients who needed more than two percutaneous tracts; or
- patients who had a residual stone after the procedure
- patients with bilateral renal calculi, Staghorn calculi.
- patients with pelvis injury&extravasation during surgery
- Patients undergone Re-look PCNL for residual stones
- Age below 18 years
- Patients who had a solitary kidney were excluded from the study
- patients with Congenital anomalies- Horse shoe kidney, Mal rotated Kidney, Duplex moiety& Ectopic kidney.

Results

Sex of Patients

Sex group	Group 1	Group 2	Total
Male	32	32	64
Female	24	24	48
Total	56	56	112

Laterality of stones

Laterality	Group 1	Group 2	Total
Right	34	32	66
Left	22	24	46
Total	56	56	112

Type of stones

Stone types	Group 1	Group 2	Total
Small stone (< 2cm)	12	20	32
Large Stone (> 2 cm)	44	36	80
Total	56	56	112

Site of stones

site	Group 1	Group 2	Total
Calyceal	17	18	35
Pelvic	30	28	58
Pelvic+calyceal	8	4	12
Upper ureter	1	6	7
Total	56	56	112

Statistical analysis between group 1 and group 2 patients (operative and post operative out come)

	Group 1	Group 2
Mean operative time	46 mins	33 mins
Mean days hospital stay	5.2 days	4.5 days
Mean analgesic requirement(diclofenac in mg)	142 mg	96 mg
Decrease in haemoglobin	0.7	0.4

POST OPERATIVE COMPLICATIONS IN OUR STUDY

Complications	No.of patients	
	Group 1	Group 2
Fever	3	3
Hematuria	2	6
Blood Transfusion	2	1
Perinephrichematoma	1	1
Ileus	0	1
Sepsis	2	1

DISCUSSION

Since the first description of percutaneous nephrolithotomy, it has become an integral part of renal stone management. The placement of percutaneous tube after the completion of the procedure has been considered standard practice to aid in hemostasis, to ensure proper drainage of urine and to facilitate easy access in case repeat PCNL is required. In the largest prospective randomized trial published yet, MS agarwal et al¹ in 2010, 202 patients treated at their center, tubeless PCNL (101 patients) was found to have significant advantages over standard PCNL (101 patients) in terms of postoperative pain, morbidity, hospital stay, and period of convalescence. To reduce discomfort and tube related morbidity, modifications have been made like the use of smaller nephrostomy tube or avoiding it completely after an uncomplicated procedure with complete stone clearance with double-J stent as tubeless PCNL. Because there is still apprehension without using a DJ stent, few have tried a totally tubeless PCNL² Limb and Bellman (2002)³described 112 patients undergoing tubeless PNL; strict criteria were used to select these patients, who had a mean stone burden of 3.30 cm². They reported a 93% stone-free rate and a mean length of hospitalization of 1.56 days; 7% required subsequent SWL ancillary treatments. These findings have recently been reproduced in similar, albeit smaller, studies (Aghamir et al, 2004 ; Karami and Gholamrezaie, 2004 ; Patel and Abubacker, 2004) Their report confirms the previous reports of shorter hospital stay, less pain and analgesia as compared to standard PCNL, and establishes its safety irrespective of bleeding, perforation, extravasation or other intraoperative issues that have previously been utilized as exclusionary criteria for this approach. According to metaanalysis conducted by Wrag ,Zhao.et al⁴ a review of the English language literature on studies involving randomized controlled trials for PCNL was done. The studies chosen to be included in their review compared tubeless PCNL with standard PCNL and described the advantages of each in the outcomes. Since we could clear almost the stones with the PCNL alone, we did not find any necessity for sandwich therapy using SWL technique. Our stone clearance rates almost similar to all other series. External ureteral catheters, tail-stents not used in our group, because JJ stents were used. Slightly higher postop duration in our study probably due to intial experience, not using additional hemostasis procedures like diathermy, small sample size when compared to some studies. Our success rates and complication rates were almost same as that of other series reported.

Conclusions

This study demonstrates that percutaneous nephrolithotomy without nephrostomy is a safe and well tolerated procedure in selected patients. We believe that tubeless percutaneous nephrolithotomy may be considered an accepted standard of care for selected cases and it is possible to reserve placement of a nephrostomy tube for specific indications. Length of stay was reduced with no major complications in either group. A large cohort of patients studied in randomised fashion would prove the advantage making PCNL, a tubeless procedure and real meaning of tubeless would be worth one's effort.

References:

1. Madhu sudhan agarwal, mayank et al . Tubeless percutaneous nephrolithotomy, Indian J Urol. 2010 Jan-Mar; 26(1): 16–24.
2. Zilberman DE, Lipkin ME, et al Tubeless percutaneous nephrolithotomy--the new standard of care? J Urol. 2010 Oct;184(4):1261-6.
3. Limb J, Bellman GC. Tubeless percutaneous renal surgery: Review of first 112 patients. Urology.2002;59:527–30.
4. Wang J, Zhao C, Zhang C, Fan X, Lin Y, Jiang Q. Tubeless vs standard percutaneous nephrolithotomy: a meta-analysis. BJU Int. 2012 Mar;109(6):918-24.