

Tubed vs tubeless PCNL, our experience at North West General Hospital and Research Center, Peshawar

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Abstract:

Objectives: To share our experience in two groups of patients, with kept and discarded nephrostomy tubes after PCNL procedure, in terms of complications, hospital stay and analgesia requirements post operatively.

Methodology: It was a prospective study on 102 consecutive patients who had under gone PCNL procedure from Jan 15 2015 to Sep 30 2015. They were divided into two groups. Group 1 patients were those in whom nephrostomy tube was inserted and group 2 patients were those in whom no nephrostomy tube was used at the end of procedure. These two groups were followed for 3 months and compared in terms of complications, hospital stay and need for analgesia post operatively

Results: Mean age was 39.6 years, male to female ratio was 1.1: 1, mean stone size was 2.6 ± 0.84 cm, 52 cases (51%) were tubed PCNLs while 50 cases (49%) were tubeless PCNLs. Mean hospital stay was 1.7 days. The mean hospital stay was high in Group 1 (2.3 days) as compared to Group 2 (1.1 days), post OP pyrexia, blood transfusion rates and readmission were high in group 1 than Group 2. Post OP analgesia requirement was less among Group 2 over Group 1. **Conclusion:** in absence of pelvicalyceal system injury, residual large stones, bleeding and potentially infected system, insertion of nephrostomy has no advantage, its removal doesn't put patient on any additional risk and rather it increases hospital stay, requirement for post operation analgesia and patients anxiety.

Keywords: Tubeless, PCNL.

Introduction:

PCNL procedure has replaced open surgical procedure in the management of renal stones all over the world^{1,2}.

In some centers of the world it is done as an outpatient procedure³. This struggle of making PCNL as an outpatient procedure raised the idea of tubeless pcnl, where the surgeons think that nephrostomy tube insertion is not necessary in all cases^{4,5,6,7}.

The main objective of our study was to assess the safety and efficacy of the tubeless pcnl as compared to the tubed pcnl and share our experience.

Methodology:

We did a prospectivestudy on 102 consecutive patients with kidney stones who underwent PCNL procedure by same surgeon at our hospital between Jan 15 2015 to Sep 30 2015. Pcnl was performed only in patients with negative urine culture. CT/BT, serum urea/ creatinine, electrolytes, CBC, LFTs, urine R/E, serum Ca and Uric acid were performed on every patient. MAG3/DTPA were performed on patients with thin renal cortex, deranged RFTs or with patient's suspicion of primary PUJ obstruction. CT-KUB, CT-IVU, X-rays IVU and U/S were used to assess the anatomy of the kidney and ureter and planning for the procedure.

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All the patients were given general anesthesia, Ceftriaxone 1gm intravenous just before the start of procedure, Inf R/L was started at start of procedure till the complete recover of patient from anesthesia in ward, ureteric catheter was passed in lithotomy position with help of cystoscope, Foleys catheter was passed and ureteric catheter was fixed to it, then all the patients were repositioned into prone, scrubbed, puncture was made under fluoroscope guidance, tract was dilated with metallic telescopic dilators, Amplatz sheath was used for insertion of Nephroscope into the pelvic calyceal system, stones were broken with Swiss pneumatic lithoclast and retrieved with help of grasper. When the decision was made to end the procedure, the nephroscope and Amplatz sheath were retrieved slowly in such manner that we could see the tract and look for any bleeding or arterial spurter from the parenchyma into the tract. If bleeding was heavy or big arterial spurter were seen inside the tract (Figure 1), we decided to insert the nephrostomy tube fixed to the skin. If no bleeding was observed, as shown in Figure 2, we removed the Amplatz and olive and simply stitched the skin wound.

DJS was inserted where ever there were residual stones that couldn't be cleared or iatrogenic tear in the pelvis. Tramadol was used for post-operative pain, patient was kept NPO till full recovery from anesthesia, ureteric and urethral catheters were removed on 1st Post OP day in most of the patients, nephrostomy tube were removed on 1st post OP day if patients did not have flank pain after removal of ureteric catheter and clamping of the nephrostomy tubes. X-ray KUB were done in all patients on 1st post OP day and X-ray Chest in those patients with supra costal assess

during the procedure.

Hospital stay was recorded in days from day of admission till day of discharge, stone size was assessed by the CT, X-rays and U/S, blood transfusions, puncture site, number of tracts, unilateral or bilateral stones, single or multiple stones, complications during the procedure and placement and non-placement of nephrostomy tubes were all recorded. All the patients were divided into two groups. Those with nephrostomy tube insertion were placed in Group 1 and those in whom no nephrostomy tube was inserted were placed in Group 2. Post OP complications, blood transfusions, hospital stay and analgesia used for pain control was compared among the two groups.

Patients were discharged on home medications for follow up after a month with fresh U/S, X-ray KUB and relevant blood investigations for stones free rates and procedure related complications. Post OP complications, blood transfusions, hospital stay, re admission and analgesia used for pain control was compared among the two groups.

Results:

Demographic data is shown in Table 1. 52 cases (51%) were tubed PCNLs while 50 cases (49%) were tubeless PCNLs. Mean hospital stay was 1.7 days, Over all information's are summarized in Table 2. Over all complications rates among the two groups is summarized in the table 3. Over all re admission were done in three patients (2.9%), all of them were group 1 patients. Two of them presented with secondary hemorrhage at 7th and 15th post OP day respectively and one presented with peri renal urinoma collection. All of them were successfully treated.

Table 3 shows the difference of complications, hospital stay, blood transfusions rates and other parameters among the two groups.

Discussion:

Pcnl has replaced open surgery and has become the procedure of choice for the management of renal stones. It has been modified with passage



Figure 2: Nephrostomy tract with bleeding



Figure 2: Nephrostomy tract with no signs of bleeding

Table 1: Demographic Data

Mean age	39.6 years
Male : Female	1.1 : 1
Stone Size	2.6 0.84 cm
Single : multiple stones	1.07 : 1
Right : Left	1 : 1.26

Table 2:

Mean hospital stay	1.7 days
Mean stone clearance	94.1%
Single Tract	5.9% cases
Multiple Tracts	94.1% cases
Blood transfusion rate	2% cases
Complications Rate	4.9% cases
Post-operative pyrexia	4% cases
Tubed PCNL	51% cases
Tubeless PCNL	49% cases

Table 3:

	GROUP 1	GROUP 2
Average Length of hospital stay	2.3 days	1.1 days
Blood transfusion	4%	0%
Analgesia dose in first 6 hours	1.6%	1%
Post OP pyrexia	2.1%	1.5%
Readmission	6%	0%
Urosepsis	1.9%	4%
Hematuria	3.8%	0%
Peri nephric Urinoma	1.9%	0%
Death	0%	0%

of time such as tubeless PCNL, totally tubeless PCNL, micro, ultra mini and mini PCNL, PCNL under spinal anesthesia and pcnl under local anesthesia.^{4,8,9}

Meta-analysis of some studies show that tubeless pcnl has advantage of less hospital stay and less requirement of post-operative analgesia.^{10,11}

Decision of putting tube varies patient to patient, tube can be avoided in patients with single tract, smooth surgery with no injury to the pelvicalyceal system during the procedure and no residual stones for whom no second procedure is required in future.^{12,13} In our study decision of putting nephrostomy was mostly dependent on bleeding from the tract, as the residual stones

were left in 5.9% cases which were treated with ESWL.No patient needed second look PCNL.

The complication rates of PCNL procedure varies from 1.1 to 88% in various studies and the most important is hemorrhage which occur in 0.6-17% cases.^{14,15} A 165 hospitals based study on PCNL procedure in England from March 2006 to January 2011 showed hemorrhage rates of 1.4%, urinary tract infection 3.8%, fever 1.7% and sepsis 0.7%. The readmission rates were 9% and the reasons were UTI 1.2%, sepsis 0.3, hematuria 1.3%, hemorrhage 0.4 and acute urinary retention 0.4%¹⁸. The complications rates in our complications are summarized in table 3 and they are comparable to the international standards.

Most commonly bleeding occur during the prick, tract formation and during the procedure. It is thought that sequential dilators Leeds to more bleeding as compared to use of Alken telescopic dilators. The most common site is the parenchyma. Many methods are used for control of the bleeding, direct diathermy, use of Nephrostomy for tamponade effect are the most common methods for stopping of the hemorrhages, use of fibrin injection have been written in some studies but they are still experimental^{16,17}. We did not use diathermy during procedure in any patient, our method of securing Hemostasis was just to look at the tract with nephroscope at the end of the procedure and in presence of significant bleeding we just put Nephrostomy tube, In our study the blood transfusion rates were 2% which is comparable to the international studies, hence just putting a Nephrostomy tube in the parenchymal tracts is safe, effective and cheap method of securing hemorrhage.

Re admission occurred in 3 patients. One patient presented with clot retention at 15th post OP day, she was catheterized in Afghanistan and referred to NWGH. Here in emergency department she was admitted and bladder wash was done. Investigations showed UTI, She was put on IV antibiotics for 3 days and discharged in good health. 2nd patient presented with hematuria episodes on 7th post OP day. CT scan reviled

grade 1 splenic injury, which went unnoticed during the procedure on his first hospital stay. He was conservatively managed with IV antibiotics and IV fluids and discharged on 4th post OP day in good health. Renal angiograms were performed on both the patients to look for pseudo aneurism but both were normal. Most probable cause of hematuria in the two patients was secondary hemorrhage due to UTI.

One patient presented with fever and flank pain on 4th post OP day, investigations revealed perinephric urinoma with suspected ureteric block. Patient underwent URS which showed blockage of ureter by soft tissue ball, so DJ stenting performed and the urinoma was drained percutaneously under ultrasound guidance. Patient was discharged on 5th post OP day in good health.

When comparing the two groups, there was significant less post OP pain, blood transfusion rate, hospital stay and readmission rates among the group 2 as compared to group 1 and Urosepsis was more among the group 2. TABLE 3.

Conclusion:

PCNL is a very safe and effective procedure for management of renal stones in well selected patients. Techniques of procedure are changing with passage of time to increase success rates and decrease morbidity and complications rates. Tubeless PCNL in selected patients has advantage over the conventional PCNL in terms of early mobilization, less hospital stay and less requirement for analgesia.

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