



# MP 15-03: Nephrostomy Tubes Placed Prior to Percutaneous Renal Stone Surgery Are Practical for Obtaining Access— An Analysis of the Utility of the Pre-Existing Nephrostomy Tubes at a Single Institution

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## INTRODUCTION/OBJECTIVES

- Renal access in percutaneous nephrolithotomy may be obtained via a pre-existing nephrostomy tube (NT) tract.
- However, emergently placed NTs are not always ideal for subsequent surgery.
- We sought to compare the usability of emergently and non-emergently placed NTs.

## METHODS

- A retrospective review was performed of UC San Diego subjects with indwelling NT undergoing percutaneous renal surgery between January 2016 and October 2018.
- Demographics and indications for NT placement were collected.
- Primary outcome** was the usability of NT tract for dilation and instrumentation and was a composite of “usable” and “partially usable” tracts.
- “Usable” indicated a tract in which PCNL could be completed without the need for additional tract creation.
- “Partially usable” indicated a tract which was dilated and used but required at least one additional tract dilation.
- “Unusable” indicated the absence of tract dilation or usage.

Table 1: Patient Demographics

Variables	Overall, n=65	Emergently, n=35	Non-emergently, n=30	p-value
Age, years Mean (SD), median	Mean: 59 (16) Median: 60	60 (17)	58 (14)	0.67
Sex, male, n (%)	32 (49%)	16 (45%)	16 (53%)	0.54
Ethnicity, n (%)	Asian 7 (11%) AA 5 (8%) Hispanic 21 (32%) Other 5 (8%) White 27 (42%)	Asian 5 (14%) AA 3 (9%) Hispanic 13 (37%) Other 3 (9%) White 11 (31%)	Asian 2 (7%) AA 2 (7%) Hispanic 8 (27%) Other 2 (7%) White 16 (53%)	0.49
BMI, mean (SD)	28 (8)	27 (7)	29 (8)	0.25
ASA Score, mean (SD)	2.7 (0.6)	2.8 (0.5)	2.6 (0.6)	0.15
PMH: CAD, n (%)	7 (11%)	3 (9%)	4 (13%)	0.54
PMH: HTN, n (%)	33 (51%)	19 (54%)	14 (47%)	0.54
PMH: DM, n (%)	15 (23%)	9 (26%)	6 (20%)	0.59

Table 1 displays patient characteristics for all patients included in this study as well as a comparison of characteristics between patients with emergently and non-emergently placed NT at time of percutaneous renal surgery.

Table 2: Indications for Placement

Emergent?	Emergent			Non-Emergent		
	Hydro/AKI	Infection (Urosepsis/Pyelo)	Other	Anticipatory	Chronic	Intra-op Staged
Totals	7	27	1	4	5	21
Used for dilation?	4 used (57%) 3 unused 0 partial	13 used (48%) 14 unused 0 partial	1 used (100%) 0 unused 0 partial	2 used (50%) 2 unused 0 partial	3 used (60%) 2 unused 0 partial	11 used (52%) 7 unused 3 partial (14%)

Table 2 displays the initial indications for placement of NT for all patients included in this study. This demonstrates the categorization process for subjects into either Emergent or Non-emergent cohorts.

Table 4 displays peri-operative, procedural and stone-related variables for patients as divided by their NT tract usability.

Table 3: Peri-operative Variables by Placement Indications

Variables	Overall, n=65	Emergently, n=35	Non-emergently, n=30	p-value
Days from NT to PCNL, mean (SD), median	Mean 46 (53) Median 27	62 (62)	26 (33)	<0.01
PCNL Laterality	34 R, 31 L	18 R, 17 L	16 R, 14 L	0.88
# Access Tracts	56x1, 9x2	33x1, 2x2	23x1, 7x2	0.04
Used for dilation? Partially used?	34 used (52%) 3 partial (5%) 28 not used (43%)	18 used (51%) 0 partial (0%) 17 not used (49%)	16 used (53%) 3 partial (10%) 11 not used (37%)	0.13
Used for dilation (Used +Partial)	37 (57%), difference in usability rates of +12 %	18 (51%)	19 (63%)	0.34 (95% CI difference -13% to +37%)
NT Location Primary	4 upper (6%) 24 mid (37%) 37 lower (57%)	2 upper (6%) 16 mid (46%) 17 lower (49%)	2 upper (7%) 8 mid (27%) 20 lower (67%)	0.28
PCNL Location Primary	19 upper (29%) 15 mid (23%) 31 lower (48%)	10 upper (29%) 9 mid (26%) 16 lower (46%)	9 upper (30%) 6 mid (20%) 15 lower (50%)	0.86
Secondary, n=9	2 upper 2 mid 4 lower 1 uk	0 upper 1 mid 1 lower 0 uk	2 upper 1 mid 3 lower 1 uk	0.51
NT Placed by IR or Urology	43 IR (66%) 22 Uro (33%)	35 IR (100%) 0 Uro	8 IR (26%) 22 Uro (73%)	<0.01
Stone Location (if present)	33 Renal (56%) 9 Upj/ureter (15%) 17 Both (29%)	18 Renal (56%) 4 Upj/ureter (13%) 10 Both (31%)	15 Renal (56%) 5 Upj/ureter (19%) 7 Both (26%)	0.78

Table 3 displays peri-operative, procedural and stone-related variables for all patients included in this study.

Table 4: Peri-operative Variables by Tract Usability

Variables	Usable NT, n=34	Partially Usable NT, n=3	Unusable NT, n=28	p-value
Days from NT to PCNL, mean (SD)	50.8 (54.4)	2.0 (0)	42.1 (53.5)	0.42
# Access Tracts	33x1, 1x2	0x1, 3x2	23x1, 5x2	<0.01
Placed Emergently?, n, (%)	18 (53%)	0 (0%)	17 (61%)	0.13
NT Location pre-operative	3 upper (9%) 12 mid (35%) 19 lower (56%)	0 upper 0 mid 3 lower (100%)	1 upper (4%) 12 mid (43%) 15 lower (54%)	0.51
Ultimate access location for PCNL	2 upper (6%) 11 mid (32%) 21 lower (62%)	1 upper (33%) 0 mid (0) 2 lower (67%)	16 upper (57%) 4 mid (14%) 8 lower (29%)	<0.01
Secondary access location for PCNL, if more than one dilated and used	1 upper 0 mid 0 lower 0 uk	1 upper 0 mid 1 lower 1 uk	0 upper 2 mid 3 lower 0 uk	n/a
NT Placed by IR or Uro	22 IR (65%) 12 Uro (35%)	0 IR 3 Uro (100%)	21 IR (75%) 7 Uro (25%)	0.03
Stone Location (if present)	14 Renal (50%) 7 upj/ureter (25%) 7 both (25%)	2 Renal (67%) 0 upj/ureter 1 both (33%)	17 Renal (61%) 2 upj/ureter (7%) 9 both (32%)	0.40

## RESULTS

- 65 PCNL cases had previously placed indwelling NT at time of percutaneous renal surgery (35 emergent, 30 non-emergent).
- Demographic and peri-operative data were similar.
- There was no significant difference between emergent vs. non-emergent groups in tract usability (emergent 51% vs. non-emergent 63% usable, difference in proportions 95% CI, -13% to 37%, p=0.34), location of NTs (p=0.29), or location of ultimate PCNL access (p=0.86).
- Total number of access tracts was greater in the cohort with unusable NT tracts (p<0.01).
- The need for subsequent upper pole access for completion of PCNL occurred in 57% of unusable NT tracts, 33% of partially usable NT tracts, and 6% of usable of NT tracts (p<0.01).
- There was no difference in stone location between those NT tracts deemed usable, partially usable, or unusable (p=0.40).

## CONCLUSIONS

Pre-existing NT, regardless of indication for placement, served as sufficient PCNL access tracts in over half of recorded cases.

Contrary to recently published reports, the utility of pre-existing NT appears to vary among health systems.

Other variables, including the desired location of PCNL appear to directly influence the likelihood of NT tract usability.