

Updates in Mini-PCNL

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Disclosures

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Objectives

- Why Mini PCNL should be part treatment regimen
- How it can be consistently outpatient and totally tubeless
- Updates in technology to improve outcomes



Why Mini-PCNL?

Mini-PCNL vs. Standard PCNL

- Advantages
 - Similar stone-free rate
 - Decreased blood loss and transfusion
 - Decreased length of hospital stay (often same day discharge)
 - · Similar rates of fever/infection
- Disadvantages
 - Longer operative time

Mini-PCNL vs. Ureteroscopy

- Advantages
 - · Possibly higher stone-free rate
 - · Shorter operative time
 - Avoid need for ureteral access sheath and risk of ureteral trauma
 - Can access difficult to reach diverticulae and lower pole stones
- Disadvantages
 - Increased risk of blood loss and transfusion
 - Higher rate of complications

30 Fr \rightarrow 20 Fr decreases volume of renal parenchyma by 56%



Slides

Miniaturized PCNL/1-2 cm stones Worki Journal of Linakogy (2014) 3411(27-1158 https://doi.org/10.1001/y00343-018-2230-x INVITED REVIEW Country Miniaturised percutaneous nephrolithotomy versus flexible ureteropyeloscopy; a systematic review and meta-analysis comparing clinical efficacy and safety profile N. F. Dawis¹ - M. R. Quinlan¹ - C. Poyet¹ - N. Lawrentschuk¹ - D. M. Beiton¹ - D. Webb¹ - G. S. Jack¹ Received 4 December 2017 / Accepted 7 Relevany 2018 / Published online: 16 Relevany 2018 ID Springer-Verlag Embri Germany, park of Springer Neture 2018 16 studies, 1598 patients, 877 Mini-Perc-721 Flex URS Patient demographics were same SFR was significant bether for Mini-Perc: 89.3 vs 80.1 (p<0.01) Hospital stay greater for Mini-Perc: 4 vs 2.2 days (p<0.01) Complications rates were not different: 19.5 vs 15.5 (p=0.18) American Urological Association Education & Research, Inc.



Uvolithiasis (2022) 50:523-533 https://doi.org/10.1007/s00240-022-01349-8

REVIEW ARTICLE



Comparison of postoperative outcomes of mini percutaneous nephrolithotomy and standard percutaneous nephrolithotomy: a meta-analysis

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Received: 10 July 2022 / Accepted: 25 July 2022 / Published online: 11 August 2022 0 The Author(s) 2022

Mini-PCNL vs. Standard PCNL

- Mini-PCNL →
 - Similar SFR (p = 0.57)
 - Similar fever rate (p = 0.08)
 - Shorter hospitalization time (p < 0.01)
 - Lower transfusion rate (p < 0.01)
 - Longer operative time (p < 0.01)

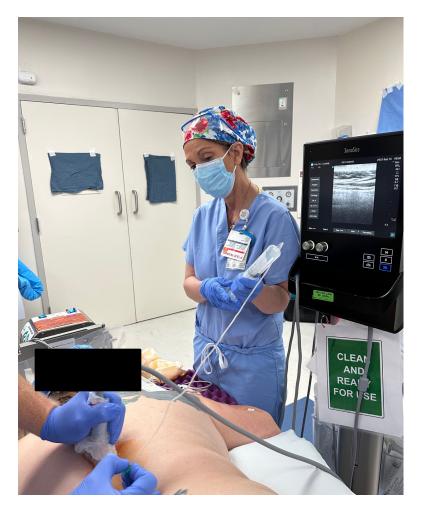


How to accomplish Outpatient Mini and standard PCNL

- Adequate non-opioid analgesia
 - Erector Spinae Block
 - No URS access sheath
 - Stent Rx regimen: Toradol, sched Tylenol, Ditropan, Flomax, pyridium;
 5 oxycodone tabs
- Control / Prevention of bleeding
 - Access by Urologist
 - Minimization of tubes
 - Consistent intraop and postop protocol at center



Ultrasound- Guided Erector Spinae Block





Positioning and Access

- Many ways to skin a stone
- Prone, Jackson bed
- Access / occlusion catheter, foley placed with flax scope on gurney (ioban)
- Ultrasound guided access, fluoro as backup – single surgeon in community setting
- Irrigation flow management system to keep at 60mm H20

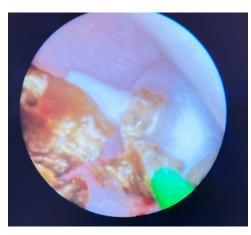


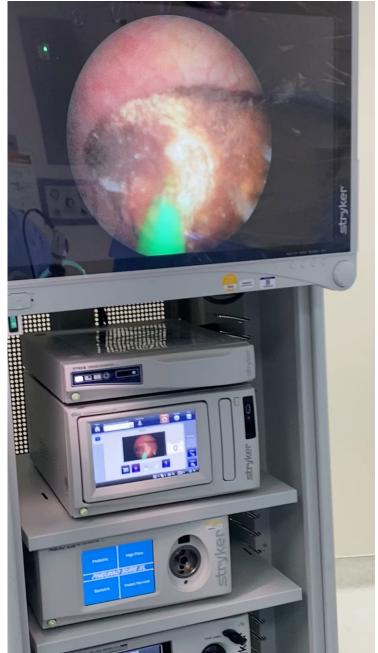




Laser Lithotripsy

- Standard 100W Holmium Laser, 365µ fiber
- Settings: 1J/20Hz, 0.4J/50Hz depending on stone
- Goal is not to basket
- Ureteral occlusion catheter







Vacuum Assisted Mini-PCNL





Vacuum Sheath

Mtendoscopy.com



Lower Pressure with VAMPCNL

Pressure

- Renal pelvis pressure significantly lower with vacuum-assisted sheath
 - 17.72 vs 12.03, p < 0.001</p>
- Time in RPP > 30 mmHg shorter
 - 3.7 vs. 23.3, p < 0.001</p>

Zhong et al. World Journal of Urology 2021.



Time and Fever rate decreased with VAMPCNL

Time

- Lithotripsy time shorter
 - 49.6 vs. 34.9 minutes, p < 0.001</p>
- → stone efficiency higher
 - 13.71 vs. 9.82 mm³/hr, p < 0.001

Meta-analysis - Fever

- 7 studies
- 1655 patients

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2hu at al 2018	10	256	36	214	25.6%	8-51 (0.28, 0.91)		
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Figure 6. Forest plot of the postspenative fever rate of the suctioning access shorth (LAX) group and the Badmonal access shorth (LAX) group

forld Journal of Urology 2021.



Stone Free Rate Higher with VAMPCNL

Meta-analysis - SFR

- 7 studies
- 1655 patients

	545		145			Odds Ratio	Odds Ratio
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1.2.1 Staghors calcul	1						
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Ko el al 2020	24	30	16	30	9.5%	3.80 (5.11, 11.02)	
2hu-et al 2019	201	254	177	256	25.8%	1.63 (1.09, 2.43)	
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1.2.2 No staghorn cal					-		
Huang et al 2016		-91	40	-91	4.5%	10.51 [3.04, 36.37]	
Lat et al 2010	47	75	54	- 75	13.0%	2.45 (0.99, 6.10)	-
Lai et al 2020	32	38	24	38	10.2%	3.11[104,9-28]	-
Song et al.3011	27	30	22	30	4.7%	3.27 (0.77, 13.83)	
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Figure 3. Forest plot of the stone-free rate of the successing access sheeth (SAS) group and the traditional access sheeth (TAS) group

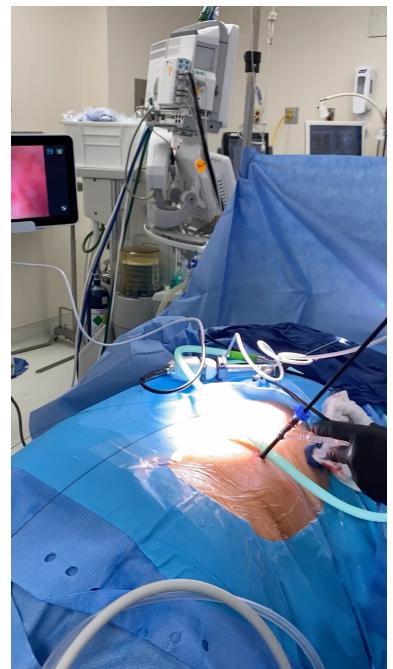
Chen et al. Urology Journal 2021





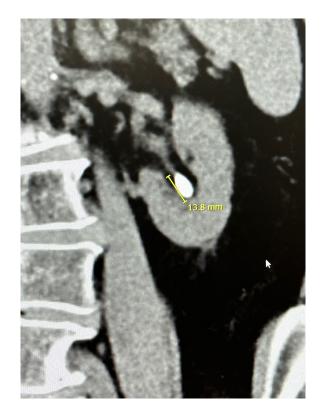


Flexible Nephroscopy





70 year old female, 14mm LLP stone





LP Access onto Stone





Stone free at End

- Total Operative Time: 63
 min from access catheter
 → skin closure (includes
 ESP block and
 repositioning)
- Fluoroscopy time: 45 sec
- Drainage: totally tubeless (no stent or NT)





TT Not Limited to LP Stones





Patient Satisfaction

- Last 50 outpatient mini/standard PCNL
 - 100% felt they had adequate pain control
 - 73% said they would choose OP again
 - Almost all of those who preferred overnight stay was due to travel distance
 - 0.09% required an unplanned healthcare visit in postop period



Not a good Mini





Thank You

