

Super-mini-percutaneous nephrolithotomy (smp) vs. Mini Percutaneous Nephrolithotomy (Miniperc) for renal stones larger than 20 mm:

An international multicentre cohort study

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Conflict of Interest Disclosure

I have no potential conflict of interest to report



• Background

- To comparatively evaluate clinical outcomes of super-mini percutaneous nephrolithotomy (SMP) and Miniperc for treating urinary tract calculi larger than 2 cm.

Table 1. Comparison of perioperative data in two groups

Value	SMP	Miniperc	P
No. of Patients	1380	1380	
Postoperative hospital stay, days	3.1 ± 1.7	4.8 ± 2.4	0.000
Mean haemoglobin drop, g/L	12.5 ± 10.9	13.7 ± 15.4	0.018
Mean operative time, min	52.2 ± 25.4	50.5 ± 23.1	0.066
Tubeless rate	1002 (72.6%)	798 (57.8%)	0.000
Nephrostomy tube	378 (27.4%)	582 (42.2%)	
JJ stent	508 (36.8%)	535 (38.8%)	0.289
Total tubeless rate	591 (42.8%)	262 (19.0%)	0.000
Pain visual analogue score (1–10 mm), mean (SD)			
6h	4.7 ± 1.4	5.1 ± 1.6	0.000
24h	2.9 ± 0.9	3.1 ± 1.1	0.000
Clavien grade I			
Fever (≥ 38.5 °C)	116 (8.4%)	165 (12.0%)	0.002
Pain	50 (3.6%)	62 (4.5%)	0.247
Hematuria	81 (5.9%)	92 (6.7%)	0.388
Clavien grade II			0.833
Fever (≥ 38.5 °C, with antibiotic therapy)	90 (6.5%)	124 (9.0%)	0.016
Initial SFR, n/N (%)	1176 (85.2%)	1150 (83.3%)	0.084
Completely stone free	980 (71.0%)	1001 (72.5%)	0.374
SFR at 3 months, n/N (%)	1258 (91.2%)	1269 (92.0%)	0.272
Completely stone free	1167 (84.6%)	1191 (86.3%)	0.195

• Materials and Methods

- An international multi-center, retrospective cohort study (Jan 1, 2016-Dec 30, 2017).
- 20 tertiary care hospitals, 5 countries (China, the Philippines, Qatar, UK, and Kuwait).
- The primary endpoint was SFR
- The secondary outcome objective was blood loss, operating time, postoperative pain scores, auxiliary procedures, complications, tubeless rate, and hospital stay.
- Propensity score matching (PSM) analysis was performed.

Result

- 2012 and 1513 patients underwent SMP and Miniperc, respectively.
- After matching, 1380 patients in each group were included.
- SMP was **equally effective** as Miniperc for moderate size renal stones
- SMP with **shorter hospital stay, higher tubeless rate, less pain and fever.**



Table3. Surgical outcome by large renal stone size.

Value	2 - 3 cm			3 - 4 cm			> 4 cm		
	SMP	Mini	P	SMP	Mini	P	SMP	Mini	P
No. Patients	668	606		515	551		197	223	
Mean age (year)	48.9±12.9	47.6±14.3	0.088	47.1±13.6	49.2±16.8	0.026	50.1±13.2	50.5±15.3	0.776
Mean stone size (mm)	24.8±10.3	25.0±7.4	0.693	33.6±7.8	32.6±8.9	0.052	52.2±10.4	50.8±8.4	0.128
Hounsfield units	960.7±254.2	967.1±223.7	0.635	921.2±265.6	935.4±278.3	0.395	934.4±212.8	921.0±245.9	0.553
Mean operative time (min)	38.5 ± 19.6	37.0 ± 17.6	0.152	60.5 ± 25.8	56.3.6 ± 24.9	0.007	77.1 ± 20.3	72.7 ± 19.3	0.000
Mean haemoglobin drop (g/L)	11.2 ± 5.4	12.4 ± 6.9	0.004	13.3 ± 7.8	14.1 ± 9.2	0.127	15.3 ± 6.9	16.1 ± 8.4	0.291
Postoperative hospital stay (days)	2.4 ± 1.1	4.2 ± 1.8	0.000	3.5 ± 0.9	4.9 ± 1.5	0.000	4.7 ± 2.0	6.2 ± 2.4	0.000
Tubeless rate	82.3%	66.3%	0.000	70.9%	57.5%	0.000	44.2%	35.4%	0.068
Fever (≥38.5°C)	5.7%	9.1%	0.020	10.3%	14.2%	0.026	14.2%	14.3%	0.968
Fever (grade II)	4.5%	7.3%	0.035	7.8%	9.6%	0.284	10.2%	12.1%	0.526
Transfusion (grade II)	0.0%	0.2%	0.223	0.4%	1.1%	0.332	2.5%	3.1%	0.712
Urinary Sepsis (III)	0.7%	1.2%	0.453	1.9%	2.9%	0.309	3.0%	4.0%	0.585
Embolization (III)	0.6%	0.8%	0.883	2.1%	2.7%	0.535	3.6%	4.5%	0.629
Multiple tracts	8.8%	10.9%	0.217	15.1%	11.1%	0.048	20.8%	13.5%	0.045
Auxiliary procedures	3.7%	6.6%	0.021	9.1%	11.8%	0.155	18.8%	13.5%	0.137
Pain visual analogue score (1–10 mm), mean (SD)									
6h	3.9 ± 1.2	4.3 ± 1.0	0.000	5.3 ± 1.6	5.6 ± 1.4	0.001	5.8 ± 0.9	6 ± 2.0	0.197
24h	2.5 ± 0.7	2.7 ± 1.3	0.001	3.2 ± 1.1	3.3 ± 1.4	0.197	3.5 ± 1.2	3.7 ± 1.6	0.152
Initial SFR, n/N (%)	93.3%	90.1%	0.040	81.4%	79.67%	0.488	68.0%	74.0%	0.178
Completely stone free	95.8%	93.2%	0.043	90.5%	92.6%	0.224	77.2%	87.0%	0.008

Conclusions

- SMP was more effective for **2-3 cm** stones compared with with Miniperc.
- SMP was less efficiency for **> 4 cm** stones with prolonged operative time.
- SMP could be an ideal treatment option for stones **less than 4 cm** stones.

