

Percutaneous nephrolithotomy: Critical analysis of unfavorable results

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*Hamad Medical Corporation, Doha, Qatar***Objective:** To identify the risk factors of unfavorable results of percutaneous nephrolithotomy (PCNL).**Patients and Methods:** A total of 602 patients were subjected to 616 PCNL procedures. Patients were divided into two groups according to the results of treatment. Group 1 with favorable results includes patients who became stone free after a single PCNL procedure without major complications. Group 2 with unfavorable results includes three subgroups: a) Patients who developed major complications, b) Those who required second major intervention to complete stone removal, and c) Patients with residual stones > 4 mm at 3 month. Risk factors for unfavorable outcome were studied by univariate and multivariate analyses.**Results:** Unfavorable results were documented in 176 patients (28.6%) due to major complications in 40 (6.5%), need for second intervention in 124 (20%), and presence of residual stones > 4 mm at 3 month in 12 (1.9%). The remaining 440 patients (71.4%) were considered of favorable outcome. Independent risk factors of unfavorable results on multivariate analysis were staghorn stones, multiple stones and stone largest diameter > 50 mm.**Conclusion:** To optimize the results of PCNL, urologists should consider careful patient selection. Patients with staghorn stones, multiple stones or large stone burden are more susceptible to unfavorable outcome.**Table 1. Presentation indicating PCNL in 616 procedures**

	# patients	%
Incidental discovery	62	10
Pain	474	77
UTI	31	5
Renal impairment	37	6
Failed ESWL	63	10
A patient may have more than one presentation		

Table 2. Definition of unfavorable outcome in 616 PCNL procedures

	# procedures (%)	Treatment
Bleeding	20 (3.2)	Blood transfusion (13)
		Angioembolization (5)
		Open surgery (1)
		Nephrectomy (1)
Septicemia	15 (2.4)	Intravenous antibiotics (15)
Hydro/hemothorax	4 (0.6)	Chest tube (4)
Colonic injury	1 (0.2)	Conservative (1)
Residual stone (> 4 mm)	136 (22)	Medical treatment (12)
		ESWL (95)
		URS (11)
		RE-PCNL (18)

Table 3. Univariate analysis of continuous risk factors unfavorable outcome after PCNL

Continuous factors	Favorable	Unfavorable	p value t-test
Age, yrs, mean \pm SD	41.9 \pm 11.3	40.8 \pm 10.4	0.27
BMI, mean \pm SD	27.2 \pm 6.2	26.1 \pm 5.2	0.10
Stone largest diameter mm, mean \pm SD	34.4 \pm 13.5	54.2 \pm 13.6	0.001

Table 4. Univariate logistic regression analysis of risk factors for unfavorable outcome after 616 procedures of PCNL

Variables	OR (95% CI)	p value
Stone size		
< 50 mm	1	
≥ 50 mm	17.5 (11.3-26.9)	0.001
Stone number		
Single	1	
Multiple	5.2 (3.1-8.8)	0.001
Staghorn	9.9 (6.3-15.9)	0.001
Stone site		
Pelvic	1	
Caliceal	1.3 (0.7-2.5)	0.41
Pelvicocaliceal	4.9 (3.1-7.7)	0.001

Table 5. Multivariate logistic regression of risk factors for unfavorable outcome after 616 procedures of PCNL

Independent factor	B	SE	EXP (B)	95% CI	p value
Multiple stones	1.71	0.455	5.53	2.3-13.5	< 0.001
Staghorn stone	1.25	0.508	3.48	1.3-9.4	< 0.01
Caliceal stones	0.54	0.374	1.72	0.8-3.6	0.15
Stone largest diameter > 50 mm	3.0	0.338	20.27	10.4-39.3	< 0.001

B = regression coefficient; SE = standard error; EXP (B) = relative risk; CI = confidence interval

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