

ESTIMATION OF GFR AT PATIENTS WITH NEPHROLITHIASIS AFTER PERCUTANEOUS LITHOTRIPSY

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OBJECTIVES

Urolithiasis is the most common urological pathology. And urological diseases are one of the risk factors for chronic kidney disease (CKD). Percutaneous nephrolithotripsy (PNL) is one of the modern methods of surgical treatment of stones, but the technique of PNL requires a direct damage of the renal parenchyma. Thus the most frequent consequences of PNL are development of CKD and renal failure.

The aim of the study was to reveal features of development of CKD and renal failure after PNL.

METHODS

We examined 32 patients with kidney stones.

Inclusion criteria: age older than 18 years, the presence of a single stone in the pelvis.

Exclusion criteria: diabetes, hypertension, congenital anomalies of the kidneys, previous operations on the kidneys, obesity, blood creatinine above 120 mmol/l.

PNL was conducted under spinal anesthesia. Blood and urine tests were performed the next day after surgery, 3,7,14 days.

Control study was carried out in 3-6 months.

GFR was calculated by the Cockcroft-Gault equation.

Statistical analysis was performed by Statistica 6.0

RESULTS

The mean age of patients was $28,4 \pm 5,1$ years. Mean GFR before surgery was $108,8 \pm 20,5$ ml /min. Average stone size was $1,4 \pm 0,4$ cm. The results of study are listed in Table 1. The study showed that renal function is reduced from the first days after PNL. The decline in GFR below 90 ml / min was found in 18 patients (56.3 %). This is evidenced by the growth of proteinuria (Table 1). Statistically significant changes of GFR were found on 7th day after surgery (*p <0,05). Despite the improvement of renal function after 1 month, GFR above 90 ml / min was determined only in 2 patients (6.2 %). Having analyzed data after 3 months, CKD was identified in 27 patients (84.4 %). After 6 months renal function was recovered at 9 patients. Transient renal failure was observed in 6 patients on 14th day after surgery. In the analysis of 6 months persistent renal failure was detected in 3 patients. Symptomatic hypertension occurred in 8 patients (25 %).

Table 1. Key indicators of renal function

Parametres	Period of observation, days							
	Before operation	1	3	7	14	30	60	180
Creatinin in blood, mmol/l	68,7±8,6	85,4±12,1	101,5±16,4	111,6±20,8*	106,9±18,6	100,3±13,1	91,6±13,8	91,3±24,2
GFR, ml/min	108,8±20,5	87,9±17,5	74,1±14,2	67,3±13,2*	70,4±13,6	74,2±12,8	81,3±14,4	84,4±20,2
Proteinuria	7 (21,9%)	23 (71,9%)	18 (56,2%)	21 (65,6%)	20 (62,5%)	17(53,1%)	12 (37,5%)	12(37,5%)
Hypertension	-	-	-	-	2 (6,2%)	5(15,6%)	5(15,6%)	8 (25%)

CONCLUSIONS

So after PNL there is 85% probability of developing CKD. In 56.3 % of the patients there was a significant decrease in GFR below 90 ml /min, and in 15.6% less than 60 ml / min. Critical period of the development of renal dysfunction is 7th day after surgery. In this period, addition of renoprotective therapy is highly recommended. PNL is a critical risk factor for kidney failure, so this surgery method is not applicable in patients with existing risk factors: hypertension, diabetes and renal failure.

