

Activation of Persistent Pathogenic Microflora in the Structure of Stones After Pyelolithotripsy and the Frequency of Nephrolithiasis Recurrence

Michael Ukhal¹, Oleh Semaniv^{2,*}, Heorhii Samunzhi²

¹Department of Urology, Odesa National Medical University, Odesa, Ukraine

²Department of Urology, Odesa State Medical Hospital, Odesa, Ukraine

Email address:

michaelukhal@ukr.net (Michael Ukhal), somik197819@gmail.com (Oleh Semaniv),
rabotaokb1986@gmail.com (Heorhii Samunzhi)

*Corresponding author

Abstract

Introduction & Objectives Infectious and process in the kidneys is one of the important factors of nephrolithiasis recurrence after surgical removal of stones. We performed studies of the activation of persistent pathogenic microflora in the structure of stones and the study of the frequency of nephrolithiasis recurrence in conditions of chronic pyelonephritis caused by persistent pathogenic microflora. *Material & Methods.* The study was conducted in 28 patients with stones localized in the renal pelvis. The size of the stones ranged from 23 to 18 mm (average 19.8 ± 1.8 mm). All patients were performed contact pyelolithotripsy with a holmium laser. *Results* During the examination before pyelolithotripsy, all patients had chronic pyelonephritis. Bacteriuria ranged from 10^3 to 10^4 . Bacteriological studies of urine revealed E. coli in 67% of patients, Enterobacter agglomerans in 15%, S. Aureus in 10%, and S. Epidermidis in 8%. Sensitivity to the main groups of antibiotics ranged from ++ to +++++. In a standard bacteriological study of a mixture of stone fragments, the bacterial microflora in the cultures differed significantly from the results of urine cultures before surgery. Thus, E. coli was cultured in 70% of patients, Proteus mirabilis - in 20%, Klebsiella pneumoniae and Enterobacter agglomerans - in 5% each, respectively. In the postoperative period, chronic pyelonephritis was activated. At the same time, sensitivity to the main groups of antibiotics was very low, and antibacterial therapy was not effective enough. Thus, in 21 patients (75%) on the 15th and 30th day after surgery, significant leukocyturia and bacteriuria persisted, reaching levels of $10^4 - 10^5$, respectively. In the long-term study (within 24 months) after surgery, 4 out of 21 patients (19%) with an inflammatory process caused by persistent pathogenic microflora in the postoperative period developed a relapse of nephrolithiasis. *Conclusions.* It has been confirmed that persistent pathogenic microflora is preserved in the fibrin-bacterial complexes and bacterial biofilms adhered to the structures of urinary stones, which, after crushing the stones, reverses into active forms with low sensitivity to the main groups of antibiotics. 2. The recurrence of nephrolithiasis in conditions of chronic pyelonephritis, is quite high, which must be taken into account when planning and using metaphylaxis methods in such patients.

Keywords

Nephrolithiasis, Chronic Pyelonephritis