

Rate of Urine Positive Culture and Double-J Catheters Bacterial Colonization on the Basis of Bacteria DNA Analysis

Introduction and Objectives: Long-term urinary stenting is associated with bacterial colonization of both catheter surface and urine. The aim of the trial was to estimate the relationship between bacterial colonization of the Double-J catheter, and the microorganisms cultured from urine. We decided to use DNA analysis of the catheter bacterial colonization as this method is thought to possess the highest diagnostic sensitivity.

Material and Methods: Sixty patients, who had Double-J polyurethane catheters inserted, participated in the study. All the participants had their midstream urine samples taken prior to the stent insertion and removal. Negative urine culture before catheterization was mandatory to participate in the study. Double-J catheters were removed and then divided under aseptic conditions into pelvical, ureteral and vesical sections. The patients were assigned into three subgroups, according to stenting duration. Bacterial and fungal DNA were identified using electrophoresis in polyacrylamide gel with a denaturing gradient (PCR-DGGE). Relationship of the catheter genetic evaluation and urine culture was estimated.

Results: Urine cultures were positive in only 8 patients, while Double-J catheter analyses were positive in all cases. In 2 cases one type of microorganism was isolated from the stent surface. The remaining 58 catheters were colonized by more than one pathogen, including 12 stents with two species and 46 stents with three types of pathogens. As was mentioned above, catheters were divided into three parts that were separately analyzed. In case of 32 stents all the three sections were colonized by the same pathogens. In 6 cases catheter cultures revealed two different microorganisms isolated from the different sections while 22 stents were colonized by three different bacteria species. Urine and stent cultures were consistent in 5 cases. In 3 cases urine culture and stent analysis were not consistent.

Conclusions: Double-J catheter retention in the urinary tract is associated with an extremely high risk of bacterial colonization, while the risk of urine infection is about 8-fold lower. There is a great inconsistency between urine infection and catheter colonization, indicating a low predictive value of urine culture for estimating stent colonization.