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INTRODUCTION & OBJECTIVES: Transitional cell carcinoma (TCC) of urinary bladder cancer is highly prevalent malignancy. One of the hallmarks of malignant neoplasms is genome instability that could be evaluated by alterations of particular microsatellite loci (alternatively termed short tandem repeats). Certain abnormalities in different microsatellite loci are previously described in urinary bladder cancer. Overall, two phenomena are described regarding molecular analysis of those loci in clinical cancer research. Microsatellite instability (MSI) is observed as a difference of the lengths of the allele’s repetitive sequence in cancer tissue compared with the original length in the genomes of any non-malignant cells of the same patient. On the other hand, loss-of-heterozygosity (LOH) occurs when one of the microsatellite alleles present in constitutive (normal) DNA is missing in the paired tumor sample DNA. The objective of this study is to investigate if only two microsatellite loci are enough informative for detection of bladder TCC and if there are any correlation with clinicopathological parameters (histopathological grades, stages or 2-years follow-up outcome).

MATERIAL & METHODS: We analyzed tissue samples from 70 patients with histopathologically confirmed TCC of the urinary bladder collected by transurethral resection and normal bladder mucosa samples from 40 patients with non-malignant diseases. Individual microsatellite GSN and D18S51 alleles were amplified in paired samples of tissue and leukocyte DNA from each patient and were resolved by electrophoresis.

RESULTS: Of the 70 analyzed patients, 44 (57.14%) have remained free of tumor recidive, metastasis or cancer-related death within 2 years of obtaining the tissue sample. Twenty six patients have either local tumor recidive, distant metastasis or have died from those causes during this evaluation period. Microsatellite alterations in either locus, or in both, were detected in 46 out of 70 patients (65.71%) with TCC, but not in the control group of patients. Thus, the calculated sensitivity of this analysis is 65.71% and specificity is 100%. We found statistically significant correlation of the frequencies of patients with microsatellite alterations in the examined loci with the three grades of histopathological T-classification (G1, G2 and G3). However, no significant correlation was found with the stages (superficial and muscle-invasive) or with occurrence of metastasis or cancer-related death within the 2-years follow-up period. In 53 patients initially diagnosed with non-muscle-invasive bladder TCC, local recurrence was recorded in 15 patients (28.3%), but we found no significant correlation with the frequency of microsatellite alterations.

CONCLUSIONS: Microsatellite alterations in GSN and D18S51 loci were observed in almost two-third of 70 patients with urinary bladder TCC. This study indicates that two selected microsatellite markers could have a potential value in clinical and pathological evaluation of urinary bladder TCC, especially regarding the tumor grades. Additional studies and further method validation are needed.