Copy Number Aberrations Predict Patient Prognosis in Non-Muscle Invasive Bladder Cancer

Introduction and Objective: Prognosis of patients with non-muscle invasive bladder cancer (NMIBC) is variable. Recent studies have demonstrated strong association of somatic copy number aberrations of chromosomes with patient prognosis. Although UroVysion (Abbot), a multicolor fluorescence *in situ* hybridization (FISH) detecting copy number of chromosomes 3, 7, 9p21, and 17, is commercially available kit for the diagnosis of NMIBC, significance of patient outcome prediction is not yet confirmed. The aim of this study is to study if UroVysion kit may predict patient outcome in NMIBC.
Materials and Methods: A Total of 102 bladder washing solutions were collected from patients who underwent TURBT, and were pathologically confirmed NMIBC from 2007 to 2010 in our institute. Parallel cytological specimens of conventional cytology and FISH were processed by centrifugation. FISH specimens were studied by UroVysion. The mean age was 70.8 years. Gender was male/female in 79, and 23 cases, respectively. Concurrent upper urinary tract urothelial cancer (UUTUC) was found in 15 cases. Aberrant fraction, sum of non-modal copy number fraction of each chromosome, and % deletion of 9p21, fraction of lesser copy number of 9p21 locus than chromosome 9 was defined abnormal when percentage of each fraction was 25% or more, and less than 15%, respectively.
Results: Recurrence and disease progression were found in 42, and 5 cases, respectively with a mean follow-up of 33.6 months. Multivariate analysis demonstrated that pathological stage and % deletion of 9p21 were independent prognostic factors for recurrence, and concurrent UUTUC, mean variant fraction to be prognostic factors for disease progression.
Conclusions: A multicolor FISH analysis using commercially available kit could be a powerful molecular marker not only for diagnosis, but also for predicting patient prognosis.