

TARGETED MULTICOLOR FLUORESCENCE IN SITU HYBRIDIZATION (FISH) DETECTS TRANSITIONAL CELL CARCINOMA (TCC) IN PATIENTS WITH ATYPICAL TRANSITIONAL CELLS BY URINARY CYTOLOGY

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A multitarget FISH probe set containing probes to the centromeres of chromosomes 3, 7, 17 and to the 9p21 band has been recently shown to have high sensitivity (81%) and specificity (96%) for the detection of TCC. Using our modified method for ThinPrep slides, we retrospectively tested 80 cases diagnosed as atypical transitional cells by urinary cytology. We evaluated the ability of FISH to identify malignant cells in cytologically equivocal cases where morphology alone does not allow definitive diagnosis. Archived slides from 80 voided or instrumented urine specimens from 63 patients with concurrent bladder biopsy data were pretreated and subjected to hybridization with the multicolor FISH probe Urovysion (Vysis). The cohort included patients with biopsy proven grade I (n=11), II (n=26), III (n=18) TCC, CIS (n=5), stage pTa (n=48), T1 (n=5), T2 (n=3), T4 (n=2) and negative histology (n=20). Positive FISH result was defined as 5 or more transitional cells with alteration of 2 or more chromosomes or 20 cells with 9p21 deletion. All except for 5 (all pTa tumors) TCC cases were positive by FISH (92% sensitivity). 9 patients positive by FISH had negative concurrent biopsy, however, 8 of them developed recurrent TCC (including one invasive T2 tumor) within a 6-month period. The only "false positive" patient had previously documented CIS also present in the immediately consecutive biopsy 15 months later. None of the 8 patients with negative biopsy and negative 6-month follow-up were FISH positive. FISH provides high sensitivity (92%) and specificity (91%) in targeted evaluation of cytologically equivocal transitional cells. The results suggest close follow-up of patients with a negative cystoscopy/biopsy but positive FISH results.