Urothelial neoplasms upregulate the expression of the telomerase enzyme, which catalyses the lengthening of chromosomal telomeres and is required for cell immortalisation and tumour growth.[1]

Using an immunocytochemical (ICC) technique, we showed expression of the human telomerase reverse transcriptase (hTERT) protein in three clinical case studies, demonstrating the benefit of this novel ancillary test.

Routine urine cytology has infamous poor sensitivity for detection of urothelial cell carcinoma (UCC), especially in low grade UCC.[2] It is advantageous to perform a hTERT ICC test as an adjunct to urine cytology to assist in the identification of patients who may have an existing UCC, or precursor lesions that may develop into UCC later.[3]

Materials and Methods

Voided urine specimens were collected fresh from AUA and processed within 48 hours at SCD. The urine was centrifuged at 4°C for 10 minutes; the supernatant was discarded and the cell pellet was washed in 1x phosphate buffered saline (PBS). The cell pellet was then fixed using ThinPrep® PreservCyt fixative at 2-8°C, producing two slides per specimen using a Cytospin 4 centrifuge. Specimen slides were stained using the Ventana BenchMark XT with the OptiView DAB IHC Detection Kit (Catalog # 760-700). Control slides containing hTERT positive peripheral blood mononuclear cells and hTERT negative squamous epithelial cheek cells were stained alongside clinical specimen slides with a hTERT antibody (Anti-hTERT Antibody; SCD-A7 Part # 01-5002) manufactured by SCD. A second slide was stained using the Papanicolaou stain and read using the Paris System for Reporting Urinary Cytology.[4] The slides were interpreted blindly.

Conclusions

• For the three cases analysed, normal or atypical urine cytology was observed.
• In all three cases there was positive hTERT staining indicating hTERT upregulation in the nuclei of urothelial cells.
• Cytoscopy confirmed the presence of UCC.
• The hTERT test may be useful as an addition to the decision-making process in the case of normal and atypical urine cytology.

References