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Direct to slide SurePath™ liquid based cytology in bronchial washings for immunohistochemical and molecular characterization of lung carcinoma

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Purpose: Exact histopathologic diagnosis and molecular profiling of lung cancer is required for the latest chemotherapy protocols. Liquid based cytology of bronchial washings for diagnostic immunohistochemistry and molecular subtyping was assessed between two systems (SurePath™ and ThinPrep™) and compared with routine cytospin, cell block and biopsy.

Methods: Bronchoscopic washings processed for liquid based cytology (Thin Prep; 20 cases and a new direct to slide system for SurePath™ 40 cases), cell block using thrombin clot method (15 cases) and direct smears (26 cases) were compared. Biopsy was done in 24 cases. Immunocytochemistry (ICC) for p40, Napsin and TTF-1 were done. Cell button was used for PCR based direct sequencing and real time PCR for EGFR mutations in Exon 19 and 21 while slides for immunocytochemistry for Cell Signaling EGFR 19 and 21 as well as for ALK D5F3 were done.

Results: Diagnostic utility for ICC diagnosis using liquid based cytology using direct to slide SurePath™ at 78% was most useful and higher than liquid based cytology using ThinPrep™ (70%), cell block (60%), direct smears (53.8%) and bronchoscopic biopsy (75%). Direct smears had inadequate number of smears for full panel of ICC. Cell blocks had no cells in 6 cases (40%). Biopsy was unsatisfactory in 8 cases due to necrosis or normal tissue only. Immunohistochemistry was best in biopsy followed by cell block and then SurePath™ based on number of interpretable tumor cells seen. Molecular testing using immunohistochemistry was possible in SurePath™ while cell buttons from SurePath™ could be tested for EGFR mutation using both direct sequencing as well as real time PCR.

Conclusions: Cytologic materials are useful addition to bronchial biopsies and provide valuable extra material on which special tests can be carried out. Liquid based cytology using direct to slide SurePath™ is an innovative new system which provides an alternative to cell blocks with easier sample preparation, better cell recovery and multiple extra smears for molecular profiling.

Biography

Venkateswaran K Iyer was trained as a Pathologist from AIIMS and from Birmingham Children's Hospital, UK for Pediatric Pathology. He is a Professor and In-Charge of Cytopathology Lab at Department of Pathology, AIIMS, India. He specializes in cervical smears, pulmonary and thyroid cytopathology as well as molecular biology with over 140 publications and has special interest in molecular biology of Wilms tumor.

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