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The diagnostic utility of mesothelial cell markers in differentiating reactive mesothelial cells from metastatic adenocarcinoma cells in pleural cytology specimen

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Introduction : The differential diagnosis between reactive mesothelial cells and metastatic adenocarcinomas is often difficult in pleural fluid cytologic specimens. According as liquid-based cytology have been recently used in non-gynecologic specimen, the utility of various immunohistochemical markers have been explored. However, there are no available data regarding mesothelial cell markers in pleural cytology specimen. Therefore, we investigated the utility of mesothelial cell markers in pleural fluid cytology in differentiating reactive mesothelial cells and metastatic adenocarcinoma cells in pleural effusion cytology specimen.

Material and methods : We performed the immunocytochemical staining for calretinin, D2-40, WT-1 and CK5/6 in sixty cases showing large number of reactive mesothelial cells without atypical glandular cells and thirty cases showing metastatic adenocarcinoma cells. The slides of sixty and thirty cases revealed an unequivocal cytologic features of reactive mesothelial cells and adenocarcinoma cells, respectively. And, all cytolgic slides were reviewed by three cytopathologists, and the cytologic diagnoses were agreed. Intensity of staining was evaluated on 3-tired scale (1+negative/weak staining, 2+moderate, 3+ strong)

Results : For calretinin, positive immunostaining revealed in both necleus and cytoplasm. The positive reaction of D2-40 was characterized by a continuous, thick, membranous staining pattern along the cell membranes. WT-1 stains the nucleus, while CK5/6 stains the cytoplasm. The strong positive rates for calretinin, D2-40, WT-1 and CK5/6 were as follows: reactive mesothelial cells (23/60), (49/60), (34/60), (36/60), and for metastatic adenocarcinoma cells (9/30), (0/30), (0/30), (4/30). The negative/weak positive rates were as follows; reactive mesothelial cells (16/60), (1/60), (7/60), (15/60), and for metastatic adenocarcinoma cells (17/30), (30/30), (30/30), (16/30). For WT-1, some cases often showed non-specific staining findings. In differentiating reactive mesothelial cells from adenocarcinoma cells, the sensitivity and specificity were 73.3% and 56.6% for calretinin, 98.3% and 100.0% for D2-40, 88.3% and 100.0% for WT-1, and 75.0% and 50.0% for CK5/6.

Conclusion : D2-40 is a specific marker for detection of reactive mesothelial cells. In differentiating reactive mesothelial cells from adenocarcinoma cells, the sensitivity and specificity of D2-40 and WT-1 are higher than those of calretinin and CK 5/6.