CYTOLOGIC DIAGNOSIS OF MALIGNANT MESOTHELIOMA WITH SERROSAL EFFUSIONS

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Background

The specificity and sensitivity of HEG1 to mesothelioma is reported to be 99% and 92%, respectively(1), and is expected to be the best mesothelial marker. Use of both BAP1 and MTAP immunohistochemistry (IHC) is recommended to separate benign from malignant mesothelial proliferations(2, 3). The aim of this study was to elucidate how to use ancillary techniques for the cytological diagnosis of mesothelioma with serosal effusions.

Materials and Methods

Cell blocks containing serosal effusions with atypical mesothelial cells from 36 mesothelioma patients, those with reactive mesothelial cells (RMCs) from 13 patients, and those with carcinoma cells from 2 patients were analyzed with IHC with HEG1, BAP1, and MTAP and with p16 fluorescence in situ hybridization (FISH).

Results

28 of the 36 mesotheliomas (77.8%) evaluated by FISH showed homozygous deletion (HD) of p16. None of eight serosal effusions with RMCs showed HD of p16. All of mesothelial cells and RMCs in cell blocks expressed HEG1, but carcinoma cells did not. Loss of BAP1 was found in 25 of 34 mesotheliomas (73.5%), but none in RMCs. Loss of MTAP was found in 10 of 12 mesotheliomas (83.3%), but none in RMCs. There was concordance between loss of MTAP staining and HD of p16 by FISH in 12 evaluable cases (100%).

<table>
<thead>
<tr>
<th>HEG1</th>
<th>BAP1</th>
<th>MTAP</th>
<th>p16 FISH</th>
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<tbody>
<tr>
<td>negative positive (%)</td>
<td>positive loss (%)</td>
<td>positive loss (%)</td>
<td>normal HD (%)</td>
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<tr>
<td>0</td>
<td>36</td>
<td>9</td>
<td>25</td>
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Table. HEG1, BAP1, MTAP immunohistochemistry and p16 FISH on cell block section of malignant pleural mesothelioma.

Conclusion

HD of p16 by FISH is observed frequently in serosal effusion of the patients with malignant mesothelioma, and MTAP IHC can be a surrogate for p16 FISH. Mesothelial cells in serosal effusion expressed HEG1 but carcinoma cells did not. Cell block analysis is recommended for patients with serosal effusions of unknown origins with the following methods: IHC with HEG1 should be performed to validate the mesothelial origin, and IHC with BAP1 and MTAP to confirm malignancy.

References