RMDO-2, Olig-2 and Synaptophysin Expression Is a Frequent Event in Malignant Melanoma: Diagnostic Pitfalls in Glial Tumor

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Malignant melanomas (MM) are known to express S-100, HMB-45 and Mart-1 and vimentin among intermediate filaments. RMDO-2 (non-phosphorylated Neurofilament, NF) expression by MM has never been reported in literature and this phenomenon is not well-known. The diagnosis of MM can be challenging because melanoma is notorious for mimicking other tumors. Immunopositivity in MM for antigens associated with other tumors may further obscure the diagnosis, particularly when there is no prior history of melanoma. The purpose and aim of this study is to determine the frequency of positivity for antigens associated with primary central nervous system tumors; RMDO-2 protein (non-phosphorylated NF), CD 56, Synaptophysin and Olig-2 in MM.

**RESULTS:**

1) All cases were positive for S100 and at least one of the melanocytic markers (e.g. HMB-45 or Melan-A). IHC results for other antigens are shown in table below:

<table>
<thead>
<tr>
<th>IMMUNOHISTOCHEMICAL STAINS</th>
<th>MM to Brain</th>
<th>MM to Other Sites</th>
<th>Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>S100 protein</td>
<td>13/14 (93%)</td>
<td>7/10 (70%)</td>
<td>(20/24) 83%</td>
</tr>
<tr>
<td>RMDO-2</td>
<td>13/14 (93%)</td>
<td>1/10 (10%)</td>
<td>(14/24) 58%</td>
</tr>
<tr>
<td>Olig-2</td>
<td>1/14 (7%)</td>
<td>4/10 (40%)</td>
<td>(5/24) 21%</td>
</tr>
<tr>
<td>Synaptophysin</td>
<td>3/14 (21%)</td>
<td>4/10 (40%)</td>
<td>(7/24) 29%</td>
</tr>
<tr>
<td>CD-56</td>
<td>2/14 (14%)</td>
<td>5/10 (50%)</td>
<td>(7/24) 29%</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:**

1) Heterogeneous expression of RMDO-2, Olig-2 and synaptophysin was found in significant subsets of MM in brain, representing potentially serious diagnostic pitfalls.

2) MM showing anomalous RMDO-2 and synaptophysin expression may easily be mistaken for primary CNS gliomas and neuroendocrine tumors. Awareness of this phenomenon and an appropriate melanocytic iHC panel should facilitate the diagnosis of metastatic melanoma with unusual immunophenotypes.

**REFERENCES:**
