Abstract. Aim: Intranodal palisaded myofibroblastoma (IPM) is a rare benign mesenchymal tumor restricted to the lymph nodes. Here, we report the case of a 44-year-old male patient with an IPM confined to the left laterocervical area. Case Report: After an accurate microscopic evaluation of morphological and histochemical stains, immunohistochemistry was performed for vimentin, smooth muscle actin vascular markers, S100 protein, D2-40, Ki67, lymphoid and melanoma markers, keratin and desmin on sections obtained from a paraffin-embedded surgical biopsy. Results: Spindle cell proliferation was positive for vimentin, smooth muscle cell actin and D2-40 and negative for the other markers. Low proliferative index, assessed by Ki67, was found. Based on morphological and immunohistochemical findings we diagnosed this case as intranodal palisaded myofibroblastoma and we highlighted a D2-40 expression in the tumor spindle cells. The presence of mast cells and their particular distribution inside the tumor are also, together with D2-40 expression, original findings of this study. No therapy was recommended after surgical and histopathological evaluation. The evolution of the patient was favorable with no other relapse following surgical removal of the lymphadenopathy. He has a normal life and no other changes of clinical and biological parameters were registered. Conclusion: To the best of our knowledge, this is the first report regarding a D2-40-positive reaction in the spindle cells of intranodal palisaded myofibroblastoma. Thus, D2-40 could be added to the panel of antibodies used for immunohistochemical diagnosis of such types of tumors.

Intranodal Hemorrhagic Spindle Cell Tumor with Amianthoid Fibers – Report of a Case with Emphasis to Mast Cell Reaction and D2-40 Expression

ANCA MARIA CIMPEAN and MARIUS RAICA

Department of Microscopic Morphology/Histology, Angiogenesis Research Center Victor Babeş University of Medicine and Pharmacy, Timişoara, Romania

Correspondence to: Associate Professor Anca Maria Cimpean, MD, Ph.D., Department of Morphologic Microscopy/Histology, Angiogenesis Research Center, Victor Babeş University of Medicine and Pharmacy, Piaţa Eftimie Murgu 2, 300041, Timişoara, Romania. Tel: +40 256204476 Fax: +40 256490626, e-mail: ancacimpean1972@yahoo.com

Key Words: Intranodal myofibroblastoma, spindle cells, D2-40, mast cells.
Figure 1. Low-power magnification of the tumor (×20). Lymph node structure can be seen to have been replaced by a well-encapsulated tumor mass composed of large fibrous areas, hemorrhagic zones and hemosiderin pigment mixed with remnant lymphoid follicles. Early stage of the lesion is characterized by collagenous areas centered by a small blood vessel (inset, ×200).

Figure 2. Large collagen-rich areas stained with Masson’s trichrome method. Note the thickness of the blue-stained collagen fibers (inset, longitudinal section, ×400).
and were paraffin embedded. Five micrometer-thick sections were stained with hematoxylin-eosin (H&E) and Masson’s trichrome (MT) stains. Immunohistochemistry was performed by a streptavidin biotin system. All immunohistochemical steps were performed in an automated fashion with a PT Link antigen retrieval System (DakoCytomation, Carpinteria, CA, USA) and a Dako Autostainer (DakoCytomation, Carpinteria, CA, USA). Antibodies used and their characteristics are shown in Table I. The procedures were in accordance with the ethical standards of the institution and the Helsinki Declaration of 1975, as revised in 1983 (7).

Microscopically, we observed a disorganized architecture of the lymph node, with most of the lymphoid mass being replaced by the tumor (Figure 1). The lesion was composed of spindle cells distributed around small blood vessels (Figure 1, inset) or surrounding large, round fibromyxoid hypocellular areas mixed with numerous hemorrhagic areas.

Figure 3. Positive immunostaining for smooth muscle actin (a), vimentin (b) and D2-40 (c) in tumor cells surrounding collagenous areas. Low expression of Ki67 (d). Numerous mast cells can be seen grouped around collagenous areas and near blood vessels (e).
and histiocytes with hemosiderin pigment. Between spindle cells, we observed acidophilic bands interposed in a disorganized manner. These acidophilic bands were found to be stained blue following MTs stain, illustrating their high collagen content (Figure 2). Tumor cells shared bland nuclear features and no significant mitotic activity. Immunohistochemical analysis showed strong positive reaction for smooth muscle actin (Figure 3a) and vimentin (Figure 3b). Immunostains for melanoma markers as melan A, melanoma associated antigen-1 (MAGE-1) as well as for cytokeratin, Epithelial Membrane Antigen (EMA), desmin, S100 protein, CD68 and vascular markers were negative in tumor cells.

A particular finding for this tumor was the positive reaction observed for podoplanin (D2-40) in the tumor spindle cells. Its expression had a cytoplasmic pattern with moderate intensity and this was a constant finding in all spindle tumor cells (Figure 3c).

The proliferative index as assessed by Ki67 antibody was less than 1% in the tumor cells (Figure 3d). Between amianthoid fibers and tumor cells, a high number of tryptase-positive mast cells were detected by immunohistochemistry. Mast cells were focally distributed (Figure 3e), usually grouped around amianthoid collagen fibers surrounding blood vessels.

**Discussion**

Non-lymphoid pathology of the lymph node includes a group of rare primary diseases, most of them of mesenchymal origin (8). IPM is a distinctive benign spindle cell tumor arising exclusively from the lymph nodes. The microscopic resemblance of IPM with schwannoma of the lymph node previously led to numerous mis-diagnoses.

IPM usually occurs in the inguinal area but a few other locations have been also reported (9). We report here a case of IPM located in a latero-cervical lymph node following a history of single inguinal lymphadenopathy that spontaneously regressed. To the best of our knowledge, this is the first case in the literature with this particular location and evolution.

A high number of mast cells surrounding the sclerosing regions and between amianthoid fibers of IPM was described here. The role of mast cells in the pathogenesis of IPM is not yet known. Bigotti et al., hypothesized that mast cells may have a crucial role, in both the formation of amianthoid fibers and in the proliferation of myofibroblasts in myofibroblastoma (11). In the final diagnosis, differential diagnosis of IPM from Kaposi sarcoma, schwannoma and metastatic melanoma lesions is mandatory. In the case reported here, the lack of reaction for vascular markers, S100 protein and melanoma markers excluded all these conditions.

In the present study, we present a case of IPM with cervical location and with expression of D2-40 in tumor

**Table I. Antibody features and methods used for each immunostain.**

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Manufacturer</th>
<th>Dilution</th>
<th>Antigen retrieval</th>
<th>Incubation time (minutes)</th>
<th>Chromogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vimentin</td>
<td>Dako Glostrup, Denmark, clone V9</td>
<td>Ready to use</td>
<td>5', MW, citrate buffer pH 6</td>
<td>30, RT</td>
<td>3,3’ Diaminobenzidine</td>
</tr>
<tr>
<td>Smooth muscle actin</td>
<td>Dako clone IA4</td>
<td></td>
<td>5', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desmin</td>
<td>Dako</td>
<td></td>
<td>5', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ki67</td>
<td>Dako, clone MIB1</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-100 protein</td>
<td>Dako, polyclonal,</td>
<td></td>
<td>5', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melan A</td>
<td>Dako</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAGE1</td>
<td>Dako</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2-40</td>
<td>Dako, clone D2-40</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD31</td>
<td>Dako, clone JC70</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD34</td>
<td>Dako, clone QBEnd10</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FVIII related antigen</td>
<td>Dako, polyclonal,</td>
<td></td>
<td>30' MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMA</td>
<td>Dako</td>
<td></td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD68</td>
<td>Dako</td>
<td></td>
<td>30', MW, citrate buffer pH 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keratin AE1/AE3</td>
<td>Dako, clone AE1/AE3</td>
<td></td>
<td>Proteinase K, 5’, RT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MW: Microwave antigen retrieval procedure; RT: room temperature.
cells. To our knowledge, this is the first report highlighting-D2-40 expression in tumor cells from IPM in addition to mast cell reaction.

Competing Interests

None.

References


Received January 20, 2013
Revised February 24, 2013
Accepted February 25, 2013