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Aneurysmal (angiomatoid) fibrous histiocytoma of the skin: an unusual variant of dermatofibroma

Abstract We present a rare case of aneurysmal (angiomatoid) fibrous histiocytoma (AAFH) of the skin on the back of a 40-year-old Japanese man. Histologically, the tumor was characterized by massive proliferation of fibroblastic and histiocytic cells, prominent aggregation of hemosiderin pigment, and the presence of blood-filled tissue spaces devoid of an endothelial lining within a capillary-rich stroma. Immunohistochemically the tumor cells were immunoreactive for vimentin and for Factor XIIIa or Mac387. Ultrastructural study revealed that the tumor was composed mainly of fibroblast-like cells intermingled with histiocyte-like cells and intermediate cells with combined features of the two types of cells. These findings support the fibrohistiocytic origin of aneurysmal (angiomatoid) fibrous histiocytoma. In addition, ultrastructural examination seems quite useful to differentiate from other cutaneous neoplasms with architectural and cytological similarities to this tumor.

Key words Dermatofibroma  Aneurysmal (angiomatoid) fibrous histiocytoma  Immunohistochemistry  Electron microscopy  Skin

Introduction

Dermatofibroma, which is a benign dermal fibrohistiocytic tumor, manifests a variety of clinical and histopathological patterns. Variants of dermatofibroma can be classified on the basis of their clinical appearance, of the main cellular composition including fibroblasts, histiocytes, endothelial cells, and collagen fibers, and of inductive phenomena affecting epithelial structures or nearby mesenchyma.1 According to the generally accepted definition, cutaneous fibrous histiocytoma is a cellular variant of dermatofibroma composed to a significant degree of phagocytic cells with the appearance of histiocytes.2 In 1981, Santa Cruz and Kyriakos3 reported unusual cases of cutaneous fibrous histiocytoma characterized by the presence of blood-filled tissue spaces devoid of a endothelial lining, pericapillary extravasation of erythrocytes, and prominent hemosiderin deposition throughout the tumors. They designated such tumors as aneurysmal (“angiomatoid”) fibrous histiocytoma of the skin (AAFH). We report here a case of AAFH, with particular reference to immunohistochemical and ultrastructural findings.

Materials and methods

A 40-year-old man presented in our clinic with a 2-year history of a solitary 12 × 8 mm cutaneous tumor located on the upper back. The tumor was asymptomatic, dark in color, and soft. A concentric brown pigmentation was seen around the tumor (Fig. 1). There was no history of trauma to the diseased location. The patient was treated by surgical wedge-shaped excision under local anesthesia.

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For immunohistochemical studies, the formalin-fixed and paraffin-embedded tissue sections were deparaffinized, rehydrated, rinsed in phosphate-buffered saline, and then stained using the avidin–biotin–peroxidase complex method4 with primary antibodies as indicated in Table 1.

The tissue for electron microscopy was fixed in 5% glutaraldehyde and postfixed in 2% osmium tetroxide, and then stained en bloc in 3% aqueous uranyl acetate solution.
Fig. 1. A solitary black tumor on the back is accompanied by a concentric brown pigmentation. Bar 10 mm

Fig. 2. Skin biopsy specimen shows a solid tumor in the dermis devoid of direct continuity with the overlying epidermis. The tumor is composed of densely packed tumor cells, dilated vascular spaces, and numerous aggregations of foam cells. H&E Bar 400 μm

Fig. 3. Irregular tissue spaces devoid of an endothelial lining are filled with foam cells containing hemosiderin pigment as well as extravasated erythrocytes. H&E Bar 100 μm

Fig. 4. Higher magnification of the tumor shows fibroblast-like cells, histiocyte-like cells, and foam cells; the nuclei of the tumor cells manifest mild pleomorphism. H&E Bar 50 μm

Fig. 5. Factor XIIIa immunostaining shows strong positive immunoreactivity in fibroblast-like cells. Avidin–biotin complex (ABC) method, counterstained with hematoxylin. Bar 100 μm

Fig. 6. Mac387 immunostaining visualizes immunoreactivity in histiocyte-like large cells and in some foam cells. ABC method, counterstained with hematoxylin. Bar 100 μm

Sections were dehydrated in graded steps of ethanol and embedded in Epon812. The 1-μm semithin sections were cut and stained with toluidine blue to select appropriate areas for observation. Ultrathin sections were doubly stained in uranyl acetate and lead citrate before examination in a Hitachi 200-CX transmission electron microscope (Tokyo, Japan) at an acceleration voltage of 100 kV.

Results

Light microscopy

Microscopic examination showed poorly circumscribed intradermal proliferation of spindle-shaped and ovoid cells