A spectrum of diseases with the dermatoscopic rainbow pattern

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Key words: aneurysmal dermatofibroma; angioma; intravascular papillary endothelial hyperplasia; Masson tumor; pleomorphic sarcoma; rainbow dermatoscopy.

INTRODUCTION

The multicolored rainbow pattern on polarized light dermatoscopy was initially believed to be a highly specific finding in Kaposi sarcoma. The feature subsequently has been described in several non-Kaposi sarcoma lesions. Here, we present 3 distinct cases of aneurysmal dermatofibroma, pleomorphic sarcoma, and intravascular papillary endothelial hyperplasia (or Masson tumor) that demonstrated the dermatoscopic rainbow pattern.

CASE SERIES

Case 1: Aneurysmal dermatofibroma

A 21-year-old woman presented with a bump on the posterior aspect of the right thigh that was occasionally tender and had been enlarging over several years. A physical examination revealed a 7 × 9−mm firm, red-violaceous nodule on the posterior aspect of the right thigh. A dermatoscopic examination of the lesion revealed the multicolored rainbow pattern within the central area of the lesion (Fig 1). Shave removal was performed. Histopathology demonstrated fibroblast proliferation within the dermis, collagen trapping at the periphery, focal interstitial hemorrhage, and an acanthotic overlying epidermis with tabled hyperpigmented rete ridges (Fig 2). The histologic features were consistent with a diagnosis of aneurysmal dermatofibroma.

Case 2: Pleomorphic sarcoma

A 79-year-old man presented with a painful nodule on his left forearm that had been rapidly growing and bleeding for several weeks. A physical examination revealed a 5-cm indurated nodule with ulceration and hemorrhagic crusting on the left forearm. A dermatoscopic examination of the lesion revealed the rainbow pattern at the periphery and ulceration in the center of the lesion (Fig 3). A shave biopsy was obtained. Histopathology demonstrated a malignant tumor in the dermis composed of atypical epithelioid cells with numerous mitotic figures and the lack of epidermal attachment. Immunohistochemical staining was performed to further classify the tumor. CD10 was strongly and diffusely positive, whereas SOX10 and pan-cytokeratin were negative (Fig 4). These features were consistent with a diagnosis of pleomorphic sarcoma.

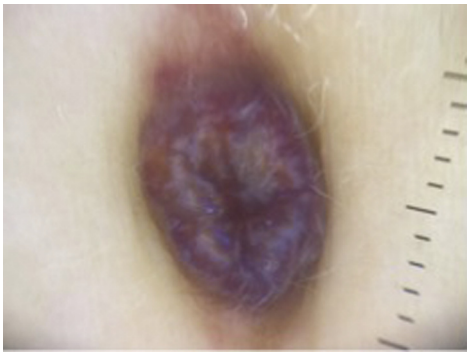

Fig 1. Multicolored rainbow pattern in an aneurysmal dermatofibroma observed on dermatoscopy.

Case 3: Intravascular papillary endothelial hyperplasia

A 60-year-old man presented for evaluation of a red bump on his right arm that rapidly enlarged over the course of several weeks and bled with

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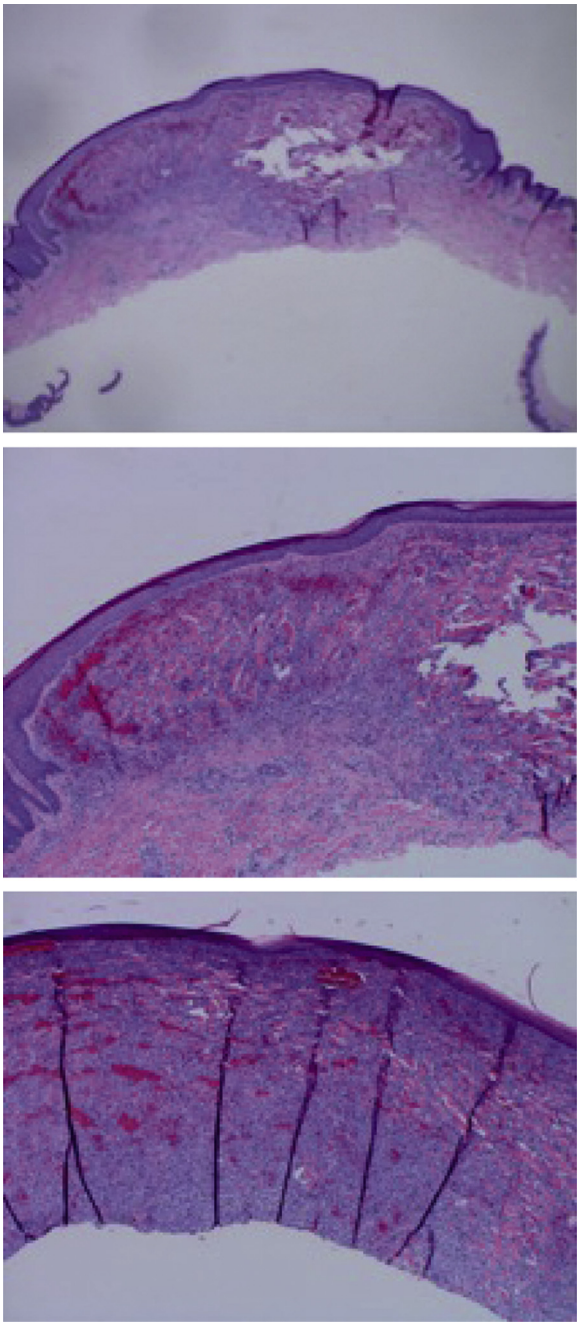

Fig 2. Histopathology of aneurysmal dermatofibroma. There are fibroblast proliferation within the dermis with peripheral collagen trapping, focal interstitial hemorrhage, and an overlying acanthotic epidermis with tabled hyperpigmented rete ridges.

minor trauma. A physical examination revealed a 7 × 7−mm red, painless nodule on the right arm. A dermatoscopic examination of the lesion revealed a vascular nodule with multicolored areas centrally (Fig 5). Shave removal was performed. Histopathology demonstrated a sharply circumscribed nodule with an intraluminal proliferation

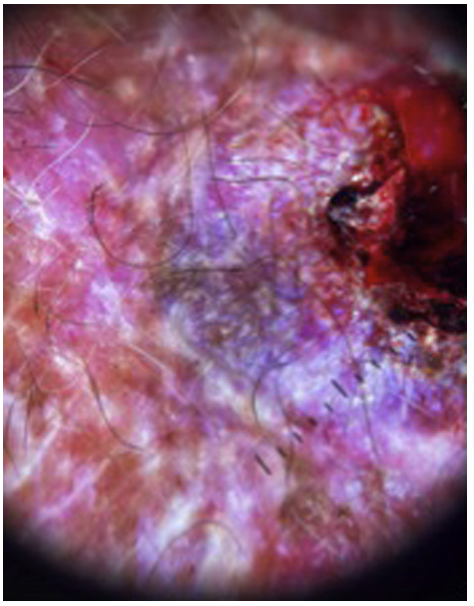

Fig 3. Dermatoscopic rainbow pattern observed at the periphery with central ulceration in a pleomorphic sarcoma.

of plump endothelial cells with papillary formations and thrombi (Fig 6). The histologic features were consistent with a diagnosis of intravascular papillary endothelial hyperplasia, also known as Masson tumor.

DISCUSSION

The rainbow pattern was first described in 2009 as a specific dermatoscopic finding in Kaposi sarcoma, with a reported specificity of as high as 100%. Since then, this pattern has been described in both benign and malignant tumors, such as melanoma, basal cell carcinoma, pyogenic granuloma, angiokeratoma, and port-wine stain.[1,2]

It was initially believed that the rainbow pattern was a reflection of the abundant vascular networks in a lesion, resulting in the diffraction of white light and the ensuing "rainbow" on polarized light dermatoscopy.[3,4] However, the rainbow pattern has also been reported in nonvascular lesions.[5] One theory proposes that the multicolored pattern is related to the interplay of different states of polarization with varying components in the lesion, resulting in an interaction between absorbance and interference-induced colors.[6]

The diagnostic significance of the rainbow pattern, as well as the histopathologic correlation, is unclear. In our report, 2 cases were benign and one case was malignant. All 3 cases had abundant vascularization on dermatoscopy and/or histopathology. We believe that the rainbow pattern on its

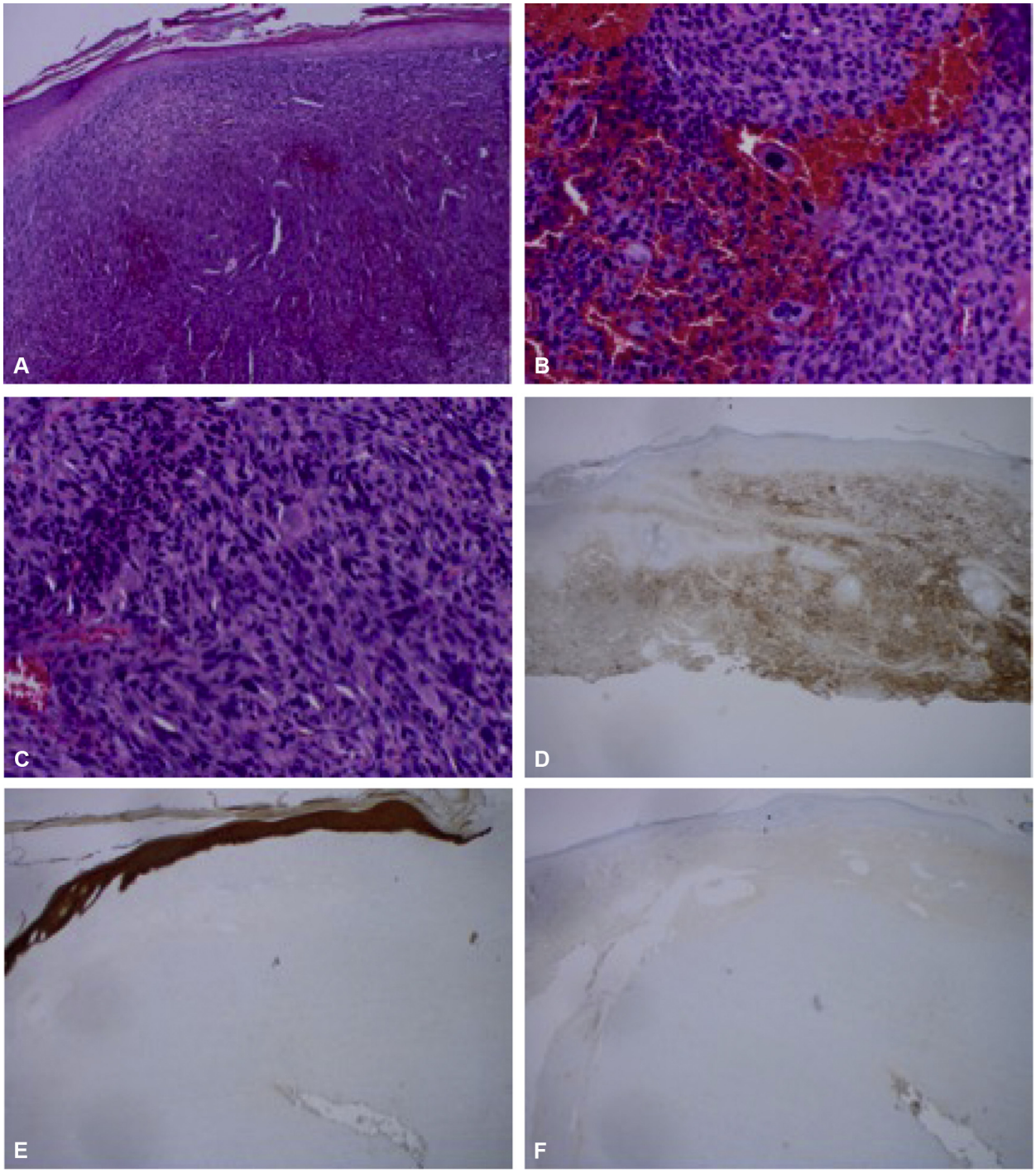

Fig 4. Histopathology of pleomorphic sarcoma. **A to C,** A tumor composed of atypical epithelioid cells and numerous mitoses closely abutted on the epidermis. **D,** CD10 immunostaining to evaluate for pleomorphic sarcoma was strongly and diffusely positive. **E,** Pan-cytokeratin immunostaining to evaluate for squamous cell carcinoma was negative. **F,** SOX10 immunostaining to evaluate for melanoma was negative.

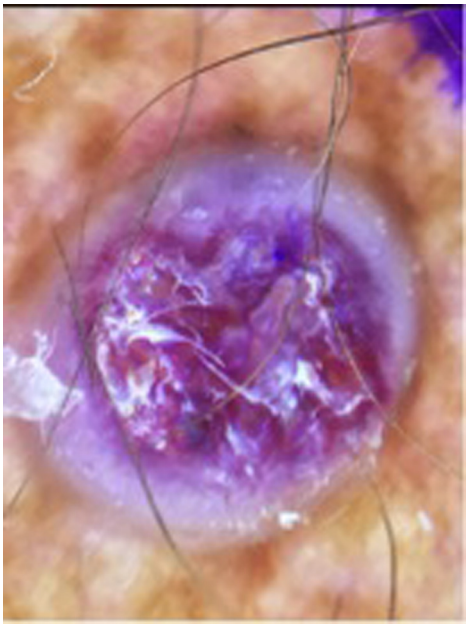

Fig 5. Intravascular papillary endothelial hyperplasia (Masson tumor) with dermatoscopic rainbow pattern in the central area.

own should not be viewed as an indicator of benign or malignant neoplasms and should be taken in context with other dermatoscopic findings.

Conflicts of interest

None disclosed.

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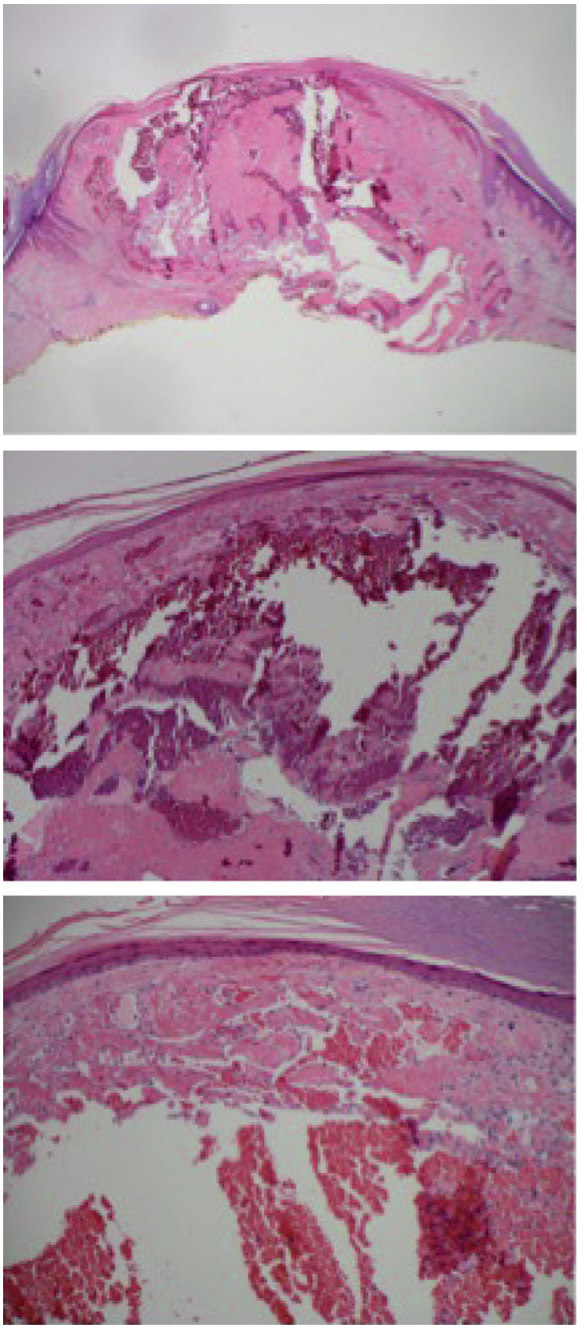

Fig 6. Histopathology of intravascular papillary endothelial hyperplasia (Masson tumor). Within the dermis is a sharply circumscribed nodule with an intraluminal proliferation of plump endothelial cells with papillary formations and thrombi.