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The Rainbow Pattern and Rosettes in Cutaneous Scars[☆]

Patrón dermoscópico en arcoíris y rosetas en cicatrices cutáneas

Recent studies carried out using polarized light dermoscopy have characterized the rainbow pattern and the rosette sign as being dermoscopic features of Kaposi sarcoma and actinic keratosis, respectively.^{1,2} These structures have also been observed in other skin lesions of varying origin, although more infrequently.^{3–7}

We observed both structures in a 13-year-old patient who visited our department because of several pruritic lesions on both knees. The lesions had appeared 2 weeks after the patient had applied an over-the-counter treatment for *verruca vulgaris* (Cryopharma; Chefaro Española) to the site.

A dermatological examination revealed multiple round, erythematous-violaceous lesions measuring 0.7 cm to 1 cm in diameter. The lesions were well-defined, had a smooth surface, and were located on both knees (Fig. 1). Using a polarized light dermoscope (Dermlite II PRO HR; 3Gen), we observed a rainbow pattern comprising several colors of the rainbow spectrum (yellow-orange, blue-violet) radiating homogeneously in a flame pattern out from the center to the periphery of each lesion. We also observed numerous irregular vessels, telangiectasias, and groups of varying numbers of whitish points (rosettes). The results of a histopathological study showed a slightly atrophic epidermis on top of bands of fibroblasts, abundant collagen bundles, and numerous vessels arranged parallel or perpendicular to the epidermis (Fig. 2); all these findings were consistent with scarring.

First described by Hu et al.,¹ the rainbow pattern is a multicolored dermoscopic feature in which all or part of a lesion contains areas showing various colors of the rainbow. Together with a bluish-reddish coloration, a scaly surface, and small brown globules, the rainbow pattern is one of the

most common dermoscopic structures of Kaposi sarcoma and it is found in up to 36% of such lesions.^{1,8} Some authors consider the rainbow pattern to be highly specific for Kaposi sarcoma (sensitivity, 36.2%; specificity, 100%).⁹ However, the same pattern has been described in melanoma,⁴ basal cell carcinoma,³ stasis dermatitis, and lichen planus.⁴

The rainbow pattern is probably caused by a complex physical phenomenon in which polarized light interacts with various elements as it passes through tissue. Cheng et al.^{8,9} hypothesize that the light beam is diffracted as it penetrates the dermis, while Vázquez-López et al.⁴ cite dichroism, a phenomenon by which light in different states of polarization undergoes variable degrees of absorbance and retardance when it interacts with the components of the tissue and therefore gives off different colors.⁴

This pattern is not associated with any particular histological structure.⁹ Cheng et al.⁹ observed that Kaposi sarcoma lesions exhibiting the rainbow pattern were made up of numerous vascular lumens lined by inconspicuous endothelial cells and scant stromal tissue, while the lesions with no rainbow pattern exhibited more abundant stromal tissue. The rainbow pattern may be linked to the vascular structure of the lesion,^{8,9} a hypothesis that might explain

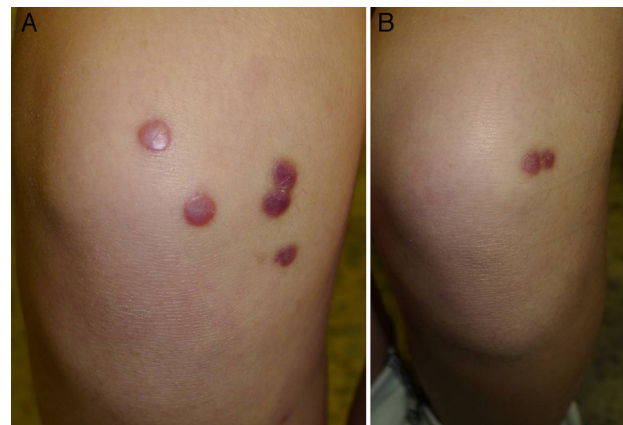


Figure 1 Rounded, violaceous papular lesions on the knees of the patient. A, Right knee. B, Left knee.

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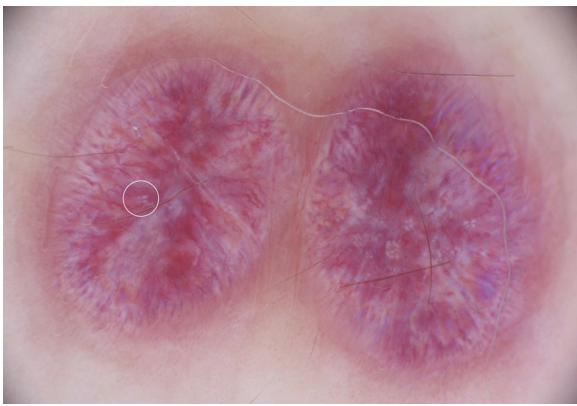


Figure 2 Image of the lesions obtained with a polarized light dermatoscope attached to a Canon Powershot A160 camera using the DermLite Foto attachment (3Gen LLC). Rosettes (indicated by a white circle in the lesion on the left; a larger number of rosettes are seen in the central area of the lesion on the right) are in evidence, along with irregularly shaped vessels and a clear rainbow pattern.

why the pattern is found in other types of skin lesions with active vascularization, such as our patient's scars.

When first described in actinic keratosis, rosettes were characterized as "4 white points arranged as a 4-leaf clover."² The sign has since been reported in other skin lesions such as squamous cell carcinoma, basal cell carcinoma, melanoma, and lichenoid keratosis.³⁻⁷ Rosettes are believed to be the result of an optical effect caused by interaction between polarized light and follicular openings.⁶

The rainbow pattern and rosettes are not considered to be specific dermoscopic features of the lesion. Since it appears that they are secondary effects of the interaction between different skin structures and polarized light, they will likely be observed in various types of skin lesions.

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Dermoscopic Rainbow Pattern in Atypical Fibroxanthoma[☆]

Patrón dermatoscópico en arcoíris en fibroxantoma atípico

We present the case of a 73-year-old man with a history of non-insulin-dependent diabetes mellitus, arterial hypertension, abdominal aortic aneurysm, and hypercholesterolemia. He was referred to our department for evaluation of a tumor on the scalp that had appeared 6 weeks earlier. The tumor was pink with some reddish and violaceous areas, had a maximum diameter of 18mm and distinct borders, was nonulcerated, and displayed mild scaling in the center (Fig. 1).

Dermoscopic examination was performed with a polarized light contact dermatoscope (DermLite Foto, 3Gen LLC) using ultrasound gel as the liquid interface. The dermoscopic images showed a round, symmetrical lesion with a reddish peripheral area from which atypical, irregularly distributed, out-of-focus blood vessels—mostly linear and unbranched—extended in a vaguely radial pattern (Fig. 2). Most of the tumor surface displayed rainbow-patterned areas, often arranged in parallel to the linear, irregular blood vessels. None of the criteria specific to melanocytic lesions were observed. Shiny whitish areas were observed between the rainbow-patterned structures, and scales were visible on the surface.

Complete surgical excision of the lesion was performed. Histologic examination revealed a nodular cell proliferation in the dermis comprising aberrant spindle-shaped cells, epithelioid cells, multinucleated giant cells, and abundant mitotic figures. Hemorrhagic zones were observed in some areas. Immunohistochemistry was positive for vimentin, CD68, and CD10 and negative for CD31, CD34, FVIII, S100,

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