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Nevus Depigmentosus: Ultrastructural and Immunohistochemical Study

Nevus Depigmentosus: estudio ultraestructural e inmunohistoquímico

Ana Panuncio[a], Patricia Saralegui[a], Carina di Matteo[b], Susana Dorce[b], Raúl Vignale[b]
[a]Electron Microscopy Unit. School of Medicine. Montevideo. [b]Dermatology Clinic. Canelones. Uruguay.

Correspondencia:
Ana Panuncio
A Gomez 1776/203 Montevideo 1140. Uruguay
Tel./Fax: 598 2 6199380
e-mail: anapan@adinet.com.uy

Nevus depigmentosus is a congenital alteration of the melanocytes. This asymptomatic lesion could have different patterns: localized, following Blaschko's lines, disseminated, unilateral or bilateral. It is an homogeneous whitish lesion with irregular or saw-like margins, without peripheral hyperpigmentation[1-4].Exceptionally the patient has any other cutaneous[5-11] or systemic manifestations associated[1, 3, 12, 13]. Different authors explain this achromic lesion as a functional defect in the melanocytes due to an abnormal synthesis of the melanosomes[1-4, 14].

Case Report

Patient 1

A 18-month-old girl presented since birth, a whitish, achromic lineal lesion with saw-like borders, on the anterolateral aspect of the arm (Figure 1).

Patient 2

A three-month-old boy with type III skin presented since birth a variegated achromic lesion, with some sparse dark areas, located on the anterolateral aspect of his right leg. It had a major diameter of 30 mm, geographical borders, without any peripheral hyperpigmentation (Figure 2). The lesions of both patients didn't dark in summer. None of them presented other cutaneous or systemic manifestations, or any familial history of similar lesions.

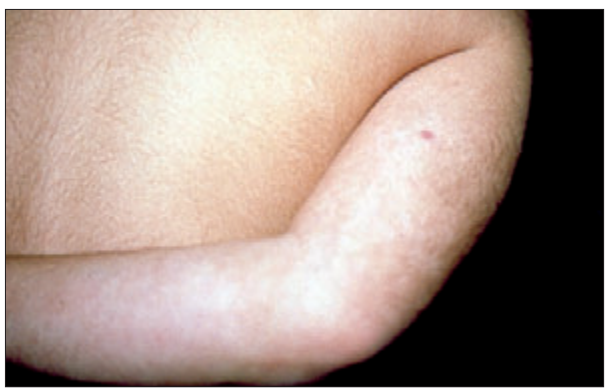

Figure 1. *Whitish lesion in the arm and forearm.*

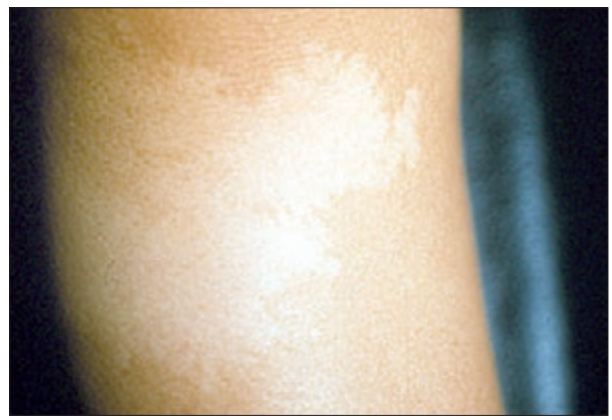

Figure 2. *Achromic lesion with irregular borders in anterolateral area of right leg.*

Methods

Skin biopsies from the achromic areas of both patients were performed. They were processed for routine light microscopy techniques, Fontana-Masson, immunolabelling for Melan A (Dako, USA) and for routine transmission electron microscopy studies.

Results

Fontana Masson technique and Melan A immunolabelling showed in both cases small melanocytes in the epidermis, with large vacuoles in their cytoplasm, which comprise and deform the nucleus, scarce number of dendrites and reduced pigmentation (Figure 3 A-B). In some areas scanty keratinocytes had light supranuclear pigmented caps or sparse melanosomes (Figure 3 A y B) (Figure 4 A y B). None of the lesions of both cases showed any inflammatory infiltrate.

Electron Microscopy

Both cases showed remarkable alterations in melanocytes. They had round shape, retraction of dendritic sprouts, degenerative

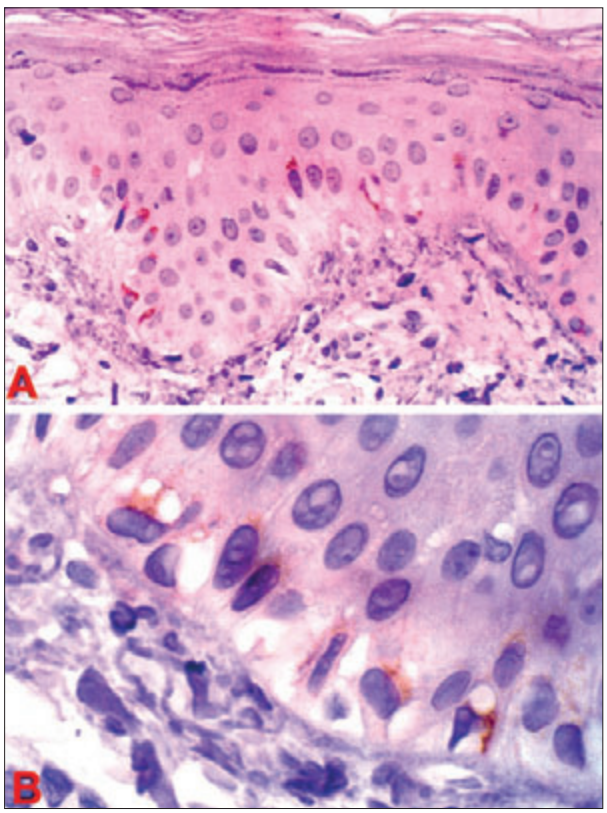

Figure 3. *A) Presence of numerous degenerative melanocytes and supranuclear melanin caps in keratinocytes. (20 X, Melan A). B) Notice the presence of cytoplasmic vacuoles and nuclear degenerative changes (40X, Melan A).*

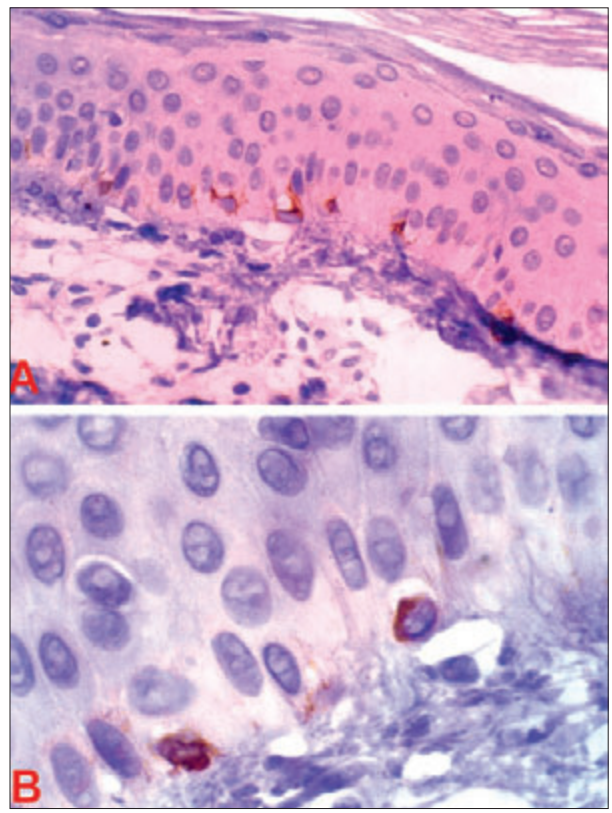

Figure 4. *A) Vacuolated melanocytes in epidermal basal cell layer (20X, Melan A). B) Cytoplasmic and nuclear degeneration of melanocytic cells (40X, Melan A).*

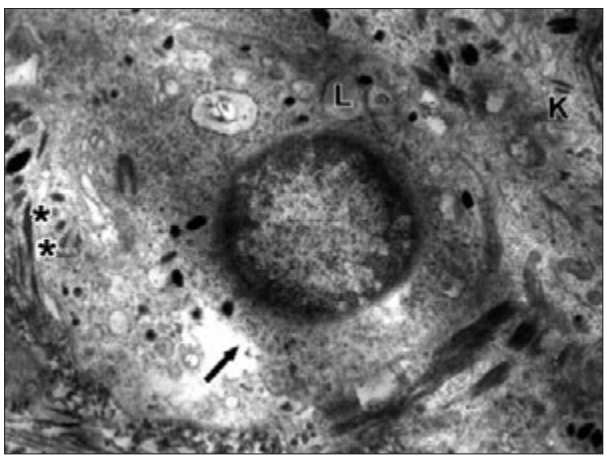

Figure 5. *Round shaped melanocytes with degenerative nucleus and vacuolated cytoplasm(arrow). Scarce number of melanosomes are present in melanocytes more of them immature (asterisks) in opposition to abundant hypopigmented melanosomes in adjacent keratinocytes, L: lipid droplet, K: keratinocyte.*

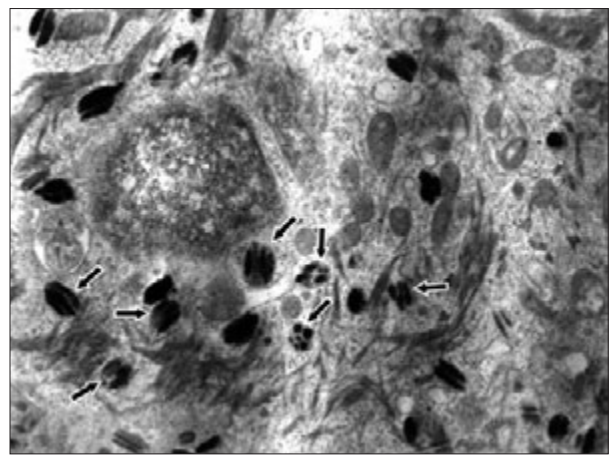

Figure 6. *Light immature secondary melanosomes in keratinocytes (arrows) in a skin type III patient.*

nuclear changes, cytoplasm with vacuolization, autophagic vacuoles and bundles of microfilaments (Figure 5). Several stages of developing melanosomes were found, most of them were immature (Figure 5). Even those melanosomes observed in patient 2 (type III skin), were clear with partially melanized matrix and cigar shaped melanosome units (Figure 6). Neighboring keratinocytes also presented light immature secondary melanosomes, which were more abundant than in melanocytes (Figure 6).

Comment

We studied by light, immunohistochemical and electron microscopy techniques 2 cases of nevus depigmentosus. Melanocytes had degenerative changes with huge vacuoles and keratinocytes showed a reduction of pigmentation in light microscopy (Figures 3 and 4). Ultrastructural studies revealed melanocytes with degenerative changes: retraction of dendrites, autophagic vacuoles and bundles of tonofilaments. These are not very remarkable in active epidermic melanocytes, but they are quite evident in inactive cells[15]. Even in the case with type III skin, we found immature melanosomes in keratinocytes, which showed an insufficient condensation of melanin (Figure 6).

Few ultrastructural studies were made on hypopigmented nevi. Some authors found autophagosomes with melanosomal aggregates in melanocytes and an alteration of melanosome transference[1, 4, 14]. We didn't find such autophagic vacuoles. We propose that in our cases, the primary event is an alteration in the synthesis of melanosomes. As we can see in Figure 5 and 6, melanosome transference to keratinocytes is not impaired. Since both patients had localized whitish congenital lesions, that remained unchanged throughout life, we made the diagnosis of Nevus Depigmentosus. Our findings suggest that nevus depigmentosus syndrome may be a group of different histopathological entities with similar clinical manifestations, explained by a genetic mosaicism.

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