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Two Cases of Melasma with Unusual Histopathologic Findings

We reported two cases of clinically typical melasma presenting with unusual histopathologic findings. In one case, the epidermal melanocytes were markedly increased in number and protruded into the dermis, and in the other case, increased epidermal pigmentation as well as dermal melanocytosis were found. We suggested that the various treatment modalities of melasma should be applied depend on its histopathologic finding.

Key Words : *Melanosis; Melasma; Melanocytes; Pendulous Melanocyte; Dermal Melanocytosis*

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INTRODUCTION

Melasma is an acquired, symmetrical hypermelanosis characterized by light to dark brown well-defined macules and patches on sun-exposed areas. It is quite common in Asian or Hispanic women. The etiology or pathogenesis of melasma is still uncertain. There have been few studies of the histopathological characteristics of melasma (1-4). It is still controversial whether the number of epidermal melanocytes is increased or not. In report on the histopathological investigation of 56 Korean women with melasma (2), the lesional skin showed an increased number and intensity for NKI-beteb stain, compared to adjacent normal skin. NKI-beteb is one of the most specific anti-melanocyte antibodies because it is a monoclonal antibody that recognizes glycoproteins of pmel-17, which are localized at the inner side of premelanosomal vesicles (5, 6). Here, we describe two cases of melasma showing unusual histopathological findings, which show protruding epidermal melanocytes into the dermis and dermal scattered melanocytes, respectively.

CASE REPORT

Patient 1

A 39-yr-old Korean woman presented with several year history of pigmented macules on her face. Physical examinations revealed multiple, 2-3 mm sized, grouped, brownish-pigmented macules on the both malar areas (Fig. 1A). Her past history was not contributory. Drugs such as estrogens or oral pill were not taken previously. The initial impression was melasma but acquired bilateral nevus of Ota-like macules (ABNOM) could not be ruled out. Skin biopsies with 2 mm punch were done on the lesional and perilesional normal skin. Histological sections of skin samples were stained with hematoxylin and eosin, Fontana-Masson, and immunohistochemical marker of melanocyte, NKI-beteb. In Fontana-Masson stained sections, the amount of melanin was increased in the lesional epidermis compared to perilesional normal skin (data not shown). The immunohistochemical findings revealed markedly increased number and staining intensity of melanocytes in the lesional epidermis compared to normal adjacent skin. Interestingly, many epidermal melanocytes protruded into the dermis (Fig. 1B). There was no atypia in melanocytes. She was treated with topical hydroquinone mixed in steroid cream.

Patient 2

A 39-yr-old Korean woman presented with 5-yr history of pigmented macules on the face. Physical examinations revealed light to dark brown colored, irregularly shaped macules and patches with ill-defined (except periorbital areas) margins (Fig. 2A). Her past history was not contributory. Drugs such as estrogens or oral pill were not taken previously. Skin biopsies with 2 mm punch were done on the lesional and perilesional normal skin. Histological sections of skin

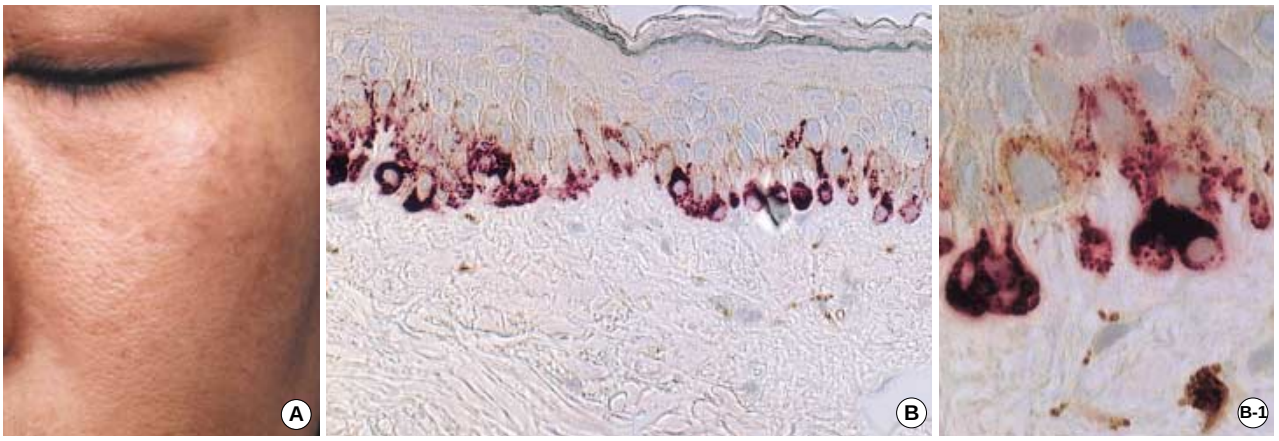

Fig. 1. (A) Malar type melasma in patient 1. (B) The melanocytes are markedly increased in number and show pendulous change (NKI-beteb, ×200), (Inset (B-1): NKI-beteb, ×1,000).

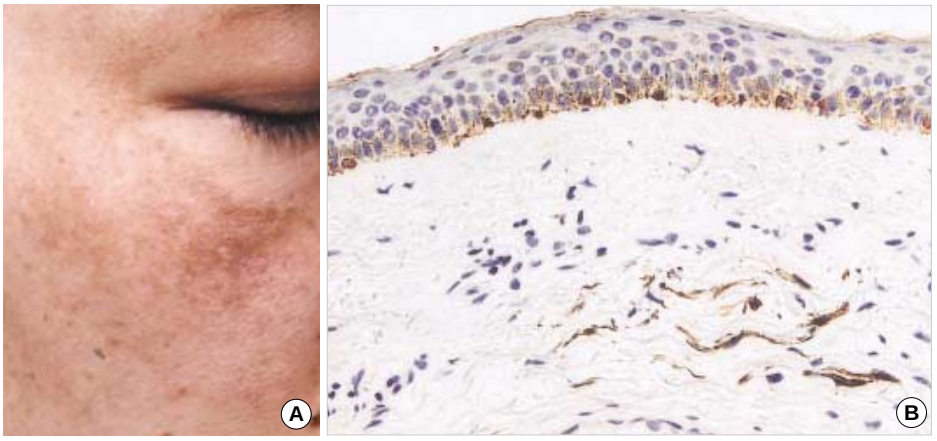

Fig. 2. (A) Malar type melasma in patient 2. (B) The lesional skin shows increased melanocytes in the epidermis and dermal dendritic pigmented cells (NKI-beteb, ×100).

samples were stained with hematoxylin and eosin, Fontana-Masson, and immunohistochemical marker of melanocyte, NKI-beteb. In Fontana-Masson stained sections, the amount of melanin was increased in the lesional epidermis and the dermis (data not shown). Interestingly the upper dermis (depth: 0.35 mm) showed many bipolar dendritic cells containing melanin mimicking the histopathological findings of Ota's nevus. The NKI-beteb stain confirmed increased number and staining intensity of melanocytes in the lesional epidermis compared to normal adjacent skin. And the dermal dendritic cells also stained positive (Fig. 2B). She was treated by a 755 nm, Q-switched Alexandrite laser.

DISCUSSION

In the present cases, we observed three unusual histopathological findings in melasma showing typical clinical manifestations. First, the number of epidermal melanocytes was markedly increased. In the normal basal layer of the epidermis, the ratio of melanocytes (MC) to keratinocytes (KC) is about 1:10 (7). However, the ratio was about 1:1 (MC:KC) in patient 1. Second, the epidermal melanocytes protruded into the dermis, in patient 1. And finally, dermal melanocytosis was present in the melasma of patient 2 like that of Ota's nevus or ABNOM except more shallow location (depth: 0.35 mm). The usual depth of dermal melanocytes in Ota's nevus was 1.3±0.1 mm (mean±SE, n=55) (3). Although histopathologic finding of dermal melanocytes was unusual, the diagnosis of melasma was proper rather than Ota's nevus or ABNOM since that ill-defined light brown patches occurred in middle-aged woman without mucosal pigment lesion or deep bluish macular lesion.

There are a few reports that describe the finding of pendulous epidermal melanocytes in the literature. The histochemical study in a case of café au lait spots in ataxia-telangiectasia suggested that pendulous change was the findings of hyperactive melanocytes (8). And the other study, Bacharach-Buhles et al. (9) showed that melanocytes could shift from the epidermis to the dermis by UVA1 irradiation. At low irradiation doses (20 J/cm^2) pendulous melanocytes protrude into the dermis and higher irradiation doses (60 J/cm^2) lead to a total elimination of, even morphologically intact, melanocytes into the dermis. Once transported into the dermis, the mela-

nocytes can be detected there for more than 4 yr.

The exact mechanism of pendulous change of the epidermal melanocytes and their dermal shift is still unknown. In normal human skin, E-cadherin-mediated adhesion between the keratinocytes and melanocytes is critical for intercellular signaling. When the melanocytes lose E-cadherin expression, the keratinocytes are not capable of controlling them (10). UV radiations can downregulate E-cadherin by upregulation of ET-1 expression in melanocytes (11). E-cadherin on keratinocytes may also be affected instead of melanocytes (10). We suggest that findings of the present cases might support study results of Bacharach-Buhles et al. (9) clinically. Namely, prolonged sun exposure might change the epidermal melanocytes into pendulous melanocytes in patient 1, and might allow shift of the epidermal melanocytes into the dermis in patient 2. In addition, we suggest that the various treatment modalities of melasma should be applied depend on its histopathologic finding.

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