LETTERS TO THE EDITOR

Acquired Dermal Melanocytosis Induced by Psoralen Plus Ultraviolet A Therapy

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Acquired dermal melanocytosis (ADM) is a pigmentary disorder clinically characterized by generally symmetrical blue-brown macules, most frequently occurring on the face of Asian women, and histologically characterized by the presence of dendritic, spindle-shaped melanocytes in the upper and mid-dermis.

CASE REPORT

A 35-year-old Japanese man with a 20-year history of psoriasis vulgaris, treated with topical corticosteroids and vitamin D3 analogues, cyclosporine, and psoralen plus ultraviolet A (PUVA) therapy, presented with multiple blue-grey, non-palpable patches on his back and upper arms. He had not noticed these lesions prior to PUVA therapy. Dermatological examination found multiple blue-grey, non-palpable macules, measuring 3–5 cm, on the back and upper extremities, with concomitant psoriatic skin changes (Fig. 1). These pigmented lesions did not affect the face, mucosa or eyes. The patient was also taking sodium valproate, and denied trauma. There was no family history of abnormal cutaneous pigmentation. Biopsy specimens from a blue-grey macule showed scattered, spindle-shaped dendritic cells containing many melanin granules in the upper and mid-dermis. On immunostaining for S-100 protein, spindle cells were positive. On electron microscopy, many mature melanocytes filled with stage IV melanosomes enclosed by an extracellular sheath were observed in the dermis of the pigmented lesion (Fig. 2), although there were also some melanophages containing melanosome complexes (Fig. 2a).

DISCUSSION

Although the clinico-pathological features of ADM have been well documented, the aetiology of this disor-

Fig. 1. Clinical findings of acquired dermal melanocytosis. Poorly demarcated blue-grey macules on the back with concomitant psoriasis.

Fig. 2. Electron microscopic findings. (a) Mature melanocytes enclosed by extracellular sheath (*) and a melanophage. (b) Mature melanocyte filled with stage IV melanosomes and enclosed by an extracellular sheath. Scale bars: (a) 10 µm; (b) 1 µm.
In contrast, the extracellular sheaths of nevi of Ota spots, where these extracellular sheaths are preserved (9), and usually disappear, as opposed to persistent Mongolian spots appear in a less developed form, decrease with age in adult life. In fact, extracellular sheaths of Mongolian spots have been demonstrated in persistent ADM (1, 2). This theory has been supported by the presence of melanocytes in the dermis of uninvolved skin adjacent to pigmented lesions (3). Exposure to ultraviolet (UV) light appears to be the most probable causative factor because: (i) idiopathic ADM is most frequently located on the zygomatic region, which is area of the face most intensively irradiated by sunlight; and (ii) late-onset dermal melanocytosis that occurs after UV radiation exposure has been reported (4, 5).

We speculate that UV played a causal role in ADM on our patient because of his history of PUVA therapy and the localization of the lesions. Other cases of UV-related acquired dermal melanocytosis have been reported (Table 1) (4–8). ADM appeared after PUVA therapy on the backs of five patients, and all of these cases were reported from Japan. Genetic factors also seem to be important, as the lesions have a much higher incidence among Japanese. Asian people may have a hereditary disposition for dermal melanocytes to reactivate. If the number of dermal melanocytes is large, ADM may appear after exposure to UV promotes the development of immature melanocytes.

Extracellular sheaths composed of fine filaments and granules (9) have been demonstrated in persistent ADM (1, 10, 11). Carmichael et al. (12) has suggested that the protective extracellular sheath enclosing dermal melanocytes seen on electron microscopy adds stability to these cells in adult life. In fact, extracellular sheaths of Mongolian spots appear in a less developed form, decrease with age and usually disappear, as opposed to persistent Mongolian spots, where these extracellular sheaths are preserved (9). In contrast, the extracellular sheaths of nevi of Ota increase in thickness with advancing age (13).

**Table I. Summary of the reported cases of ultraviolet-associated acquired dermal melanocytosis with extrafacial involvement**

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Age, years/Sex</th>
<th>Ethnic group</th>
<th>Association</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ono et al. (4), 1991</td>
<td>75/M</td>
<td>Japanese</td>
<td>PUVA</td>
<td>Back, shoulder, upper extremities</td>
</tr>
<tr>
<td>Shinohara et al. (6), 1994</td>
<td>62/M</td>
<td>NM</td>
<td>PLE/contact dermatitis</td>
<td>Dorsa of the hands and forearms</td>
</tr>
<tr>
<td>Toriyama et al. (7), 1995</td>
<td>NM/M</td>
<td>Japanese</td>
<td>Chronic actinic dermatitis</td>
<td>Dorsa of the hands</td>
</tr>
<tr>
<td>Kayashima et al. (8), 1997</td>
<td>50/M</td>
<td>NM</td>
<td>PUVA</td>
<td>Back</td>
</tr>
<tr>
<td></td>
<td>23/F</td>
<td>NM</td>
<td>PUVA</td>
<td>Back</td>
</tr>
<tr>
<td>Murakami et al. (5), 2000</td>
<td>24/F</td>
<td>Japanese</td>
<td>Tanning bath</td>
<td>Photo exposed areas (except face)</td>
</tr>
<tr>
<td>Current case, 2011</td>
<td>35/M</td>
<td>Japanese</td>
<td>PUVA</td>
<td>Back, upper arms</td>
</tr>
</tbody>
</table>

PUVA: psoralen and ultraviolet A radiation; NM: not mentioned; PLE: polymorphic light eruption.

**REFERENCES**