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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).

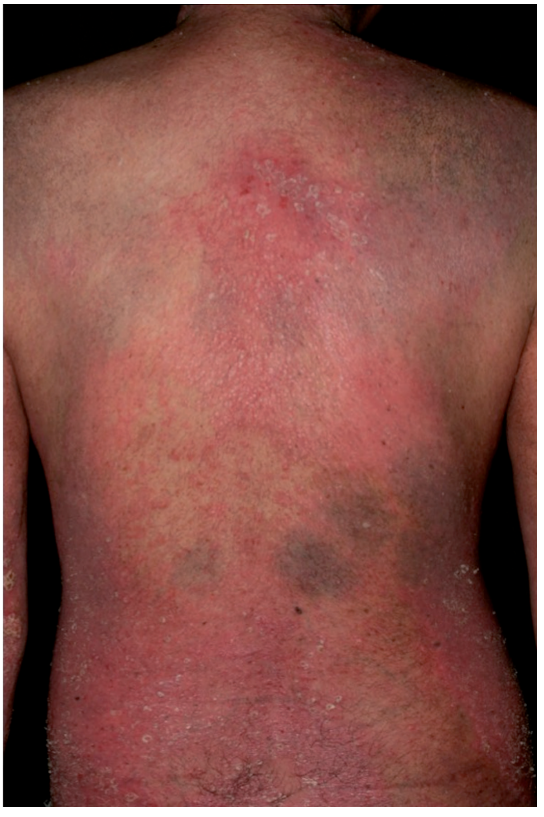

Fig. 1. Clinical findings of acquired dermal melanocytosis. Poorly demarcated blue-grey macules on the back with concomitant psoriasis.

DISCUSSION

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

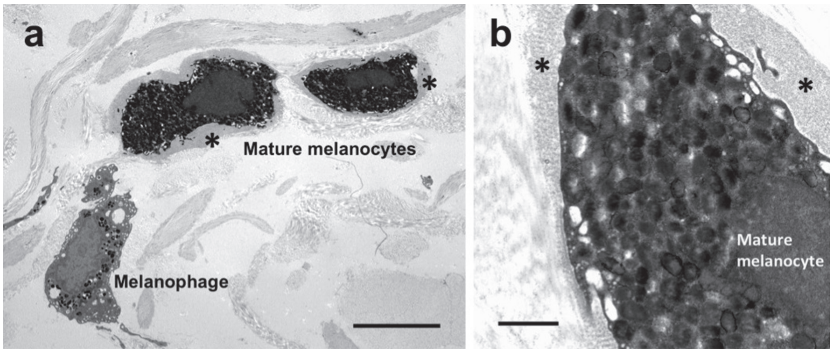

Fig. 2. Electron microscopic findings. (a) Mature melanocytes enclosed by extracellular sheath (*) and a melanophage. (b) Mature melanocyte filled with stage IV melanosomes and enclosed by an extracellular sheath. Scale bars: (a) 10 μm; (b) 1 μm.

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

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

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

der is currently unknown. However, there are multiple hypotheses for the pathogenesis of ADM. One theory is reactivation of pre-existing immature dermal melanocytes by various factors, such as sunlight, drugs and hormonal treatment with oestrogen and/or progesterone (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 the 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 I) (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 melanocytosis. 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 naevus of Ota increase in thickness with advancing age (13).

REFERENCES

1. Hori Y, Kawashima M, Oohara K, Kukita A. Acquired, bilateral nevus of Ota-like macules. J Am Acad Dermatol 1984; 10: 961–964.
2. Mizoguchi M, Murakami F, Ito M, Asano M, Baba T, Kawa Y, et al. Clinical, pathological, and etiologic aspects of acquired dermal melanocytosis. Pigment Cell Res 1997; 10: 176–183.
3. Mizushima J, Nogita T, Higaki Y, Horikoshi T, Kawashima M. Dormant melanocytes in the dermis: do dermal melanocytes of acquired dermal melanocytosis exist from birth? Br J Dermatol 1998; 139: 349–350.
4. Ono T, Egawa K, Kayashima K, Kitoh M. Late onset dermal melanocytosis: an upper back variant. J Dermatol 1991; 18: 97–103.
5. Murakami F, Baba T, Mizoguchi M. Ultraviolet-induced generalized acquired dermal melanocytosis with numerous melanophages. Br J Dermatol 2000; 142: 184–186.
6. Shinohara M, Matsushita T, Toriyama F, Yoshida H. [A case of dermal melanocytosis on the forearms and dorsal hands]. Nishinihon J Dermatol 1994; 56: 1097 (in Japanese).
7. Toriyama F, Yamanouchi H, Shinohara M, Watanabe M. Acquired dermal melanocytosis of the dorsa of bot hands associated with chronic actinic dermatitis. Australas J Dermatol 1995; 36: A35.
8. Kayashima K, Kito M, Toun J, Ono T. [Three cases of PUVA-induced dermal melanocytosis]. Jpn J Dermatol 1997; 107: 49 (in Japanese).
9. Okawa Y, Yokota R, Yamauchi A. On the extracellular sheath of dermal melanocytes in nevus fusco-ceruleus acromiodeltoideus (Ito) and Mongolian spot. An ultrastructural study. J Invest Dermatol 1979; 73: 224–230.
10. Fukuda M, Kitajima J, Fushida H, Hamada T. Acquired dermal melanocytosis of the hand: a new clinical type of dermal melanocytosis. J Dermatol 1993; 20: 561–565.
11. Jimenez E, Valle P, Villegas C, Roo E, Sanchez Yus E, Furio V. Unusual acquired dermal melanocytosis. J Am Acad Dermatol 1994; 30: 277–278.
12. Carmichael AJ, Tan CY, Abraham SM. Adult onset Mongolian spot. Clin Exp Dermatol 1993; 18: 72–74.
13. Hori Y, Ohara K, Niimura M, Kukita A. Electron microscopy. Ultrastructural observations of the extracellular sheath of dermal melanocytes in the nevus of Ota. Am J Dermatopathol 1982; 4: 245–251.