Acquired brachial cutaneous dyschromatosis

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Key words: hyperpigmentation; melanocyte; melanoma; microphthalmia-associated transcription factor.

INTRODUCTION

Acquired brachial cutaneous dyschromatosis (ABCD) is an asymptomatic pigmentary disorder of the bilateral dorsal forearms that often presents in postmenopausal middle-aged women. It was first reported by Rongioletti and Rebora in 2000 when they observed this phenomenon in 20 Caucasian middle-aged women and one man.[1] Since then, an additional 6 cases of ABCD have been reported in the literature (23 females and 3 males).[1-3] Given the rarity of ABCD, we report a case in a patient with a history of cutaneous melanoma. Moreover, we used immunohistochemistry to examine the melanocyte inducing transcription factor (MITF) pathway as a possible etiology for the hyperpigmentation.

Abbreviations used:

ABCD: acquired brachial cutaneous dyschromatosis
MITF: melanocyte inducing transcription factor

CASE REPORT

A 53-year-old postmenopausal woman presented to Massachusetts General Hospital Pigmented Lesion Center for routine annual surveillance after being diagnosed with a superficial spreading melanoma (Breslow thickness 0.5 mm, nonulcerated, 0 mitoses) of the back in 2013. She noted a 5-month history of asymptomatic hyperpigmented lesions on bilateral dorsal forearms that began during the summer. She did not notice any change in the lesions since first observing them and has no previous history of abnormal skin pigmentation. Although the patient denied a history of peeling or blistering sunburns and tanning bed use, she did have stigmata of chronic sun exposure, such as dense solar lentigines in a photo-distribution. Her occupation requires her to be inside during the day. Past medical history includes melanoma of the right mid-back and uterine fibroids. Past surgical history includes a hysterectomy 10 years prior and a wide local excision of her melanoma. She does not take any medications. She had taken oral contraceptive pills 20 years ago and in vitro fertilization medications 15 years ago. She denied beginning any new medications at the time of the initial presentation of the lesions. The patient denied any smoking or tobacco use.

Physical exam (Fig 1, *A-C*) showed large irregular well-circumscribed geometric and angulated patches of tan/brown pigmentation on both dorsal forearms, with scattered telangiectatic vessels; there was no evidence of the process on the ventral surface. Wood's light examination (Fig 1, *D* and *E*) accentuated the pigmented area.

Biopsies were performed in both affected and nonaffected skin. Histology of the pigmented area showed focal increased pigmentation of epidermal keratinocytes and focal perifollicular chronic inflammation in a background of solar elastosis and epidermal atrophy. SRY-box transcription factor 10 (SOX10) and MITF immunostains revealed a slight increase in melanocyte density. Pronounced apical capping of pigment was appreciated on Fontana stain. Iron staining was performed and found to be negative. The nonpigmented sample showed only

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Funding sources: None.

IRB approval status: Not applicable.

Patient consent statement: Consent for the publication of all patient photographs and medical information was provided by the authors at the time of article submission to the journal stating that all patients gave consent for their photographs and medical information to be published in print and online and with the understanding that this information may be publicly available.

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JAAD Case Reports 2023;37:110-3.
2352-5126

https://doi.org/10.1016/j.jdcr.2023.05.007

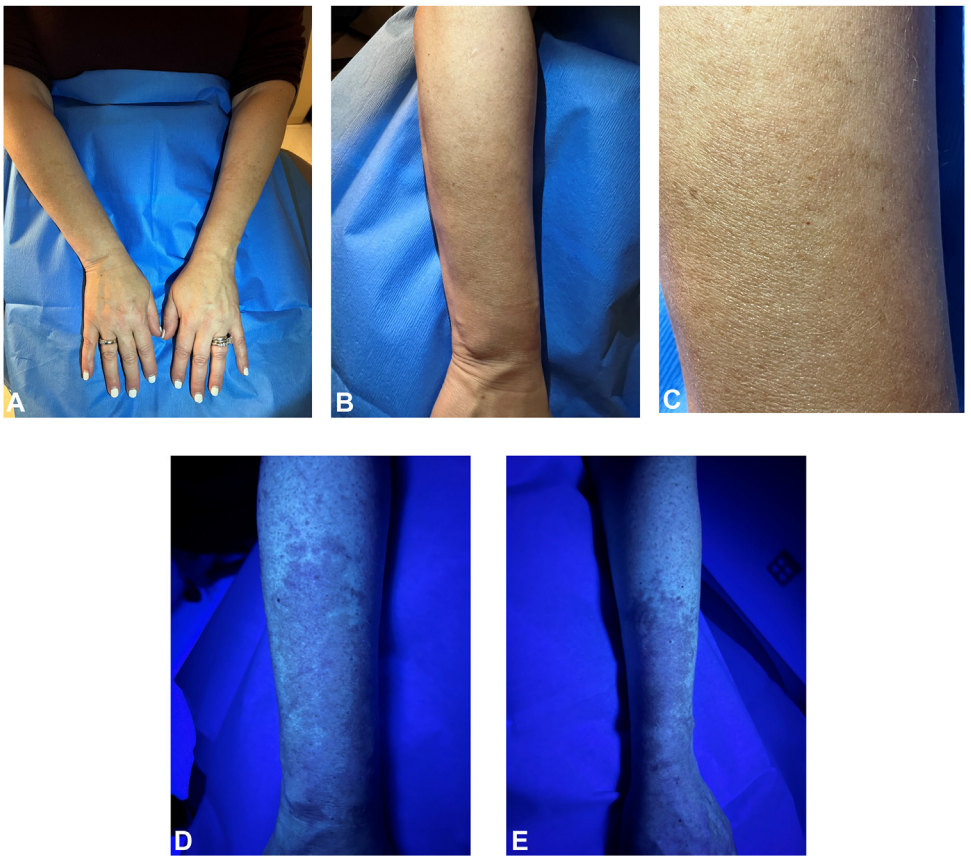

Fig 1. A, Hyperpigmentation of bilateral forearms (**B**) high powered image showing contrast between hyperpigmented lesion and the patients normal skin pigmentation (**C**) high powered image illustrating the geometric, often angulated borders of the lesion (**D** and **E**) images taken under Wood's lamp, highlighting the distinct areas of hyperpigmentation of the bilateral forearms.

epidermal atrophy and solar elastosis with a normal density of melanocytes (Fig 2).

As the p53-MSH (melanocyte-stimulating hormone)-MITF axis has been shown to be a mechanistic link between ultraviolet damage in the keratinocytes and pigmentation in the melanocytes, we assessed p53 levels in the samples.[4] While p53 staining appears comparable between the affected and nonaffected areas, there appears to be a greater number of p53-positive cells in the affected area (Fig 2).

DISCUSSION

ABCD presents as asymptomatic, irregular, gray-brown patches with geographic borders, occasionally interspersed with hypopigmented, slightly atrophic macules, most commonly on bilateral forearms.[1] Histologically, there is epidermal atrophy with blunted rete ridges, basal layer hyperpigmentation, telangiectatic vessels in the upper portion of the dermis, and solar elastosis.[1]

There are 2 main hypotheses regarding the etiopathogenesis of this pigmentary disorder, one being the association with hypertension and hypertensive medications, specifically angiotensin converting enzyme inhibitors, with one study showing 65% of patients with ABCD having a diagnosis of hypertension.[1] However, this may be merely an observed association due in part to the higher prevalence of hypertension in this age group.[5] The fact that angiotensin II has been found to stimulate melanogenesis suggests angiotensin converting enzyme inhibitors may not be the cause of the hyperpigmentation.[6] The second hypothesis suggests chronic sun exposure as the etiology, evidenced by the histopathologic findings of hyperpigmentation, epidermal atrophy, superficial telangiectasias and solar elastosis, as well as the association with Poikiloderma of Civatte, another pigmentary condition related to sun exposure.[1]

While our patient has never taken hypertensive medications, her melanoma diagnosis suggests

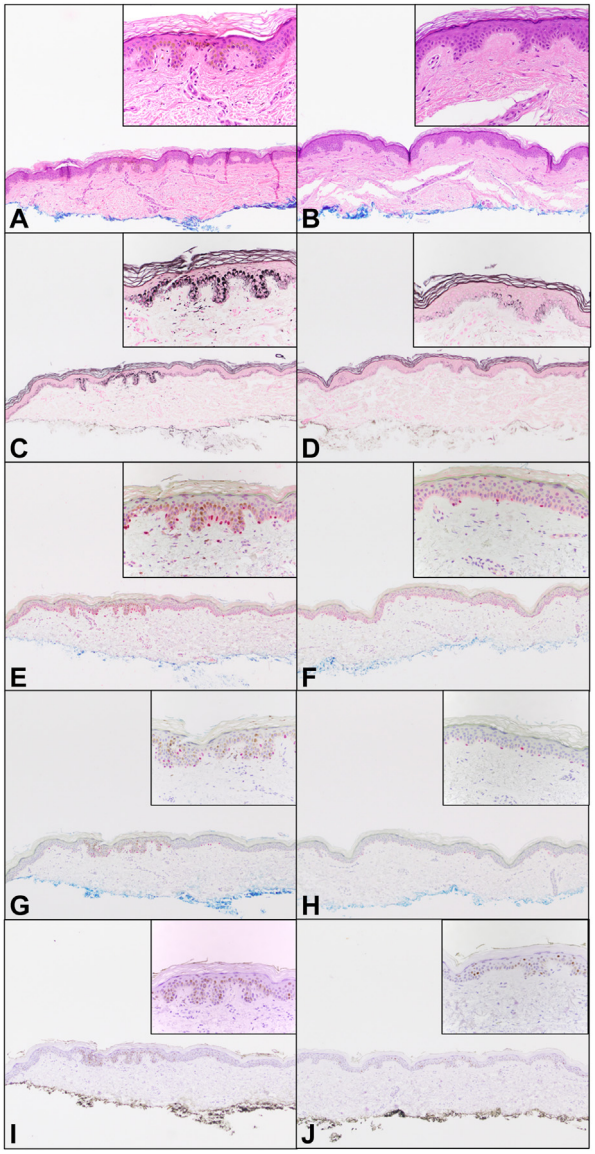

Fig 2. Histological findings of a hyperpigmented lesion (**A**, **C**, **E**, **G** and **I**) and normal skin (**B**, **D**, **F**, **H** and **J**). A focus of hyperpigmentation is identified in affected skin on Hematoxylin and Eosin (**A**, 100×, insert 400×) and highlighted by a Fontana stain (**C**, 100×, insert 400×), as compared with normal skin (**B**, Hematoxylin and Eosin 100×, insert 400×; **D**, Fontana. 100×, insert 400×). SOX10 (**E** and **F**, 100×, insert 400×) and melanocyte inducing transcription factor immunostains (**G** and **H**, 100×, insert 400×) show a focal increase in melanocyte density in affected skin (corresponding to the hyperpigmented area) compared to normal skin. P53 immunostain (**I** and **J**, 100×, insert 400×) shows a similar staining pattern in affected and normal skin samples.

chronic sun exposure as a possible trigger for her ABCD. With MITF and p53 immunostaining showing a focal increase in melanocytic density (Fig 2, *G* and *I*, respectively), we hypothesize that the increased pigmentation may be due to increased p53 because of ultraviolet damage. P53 promotes transcriptional activation of the pro-opiomelanocortin gene which is cleaved into α-melanocyte-stimulating hormone (MSH), stimulating the cyclic AMP-cyclic AMP-response element binding protein (CREB)-MITF pathway in melanocytes leading to the production of melanin and the transfer of melanosomes to keratinocytes.[7]

Clinically, there are several conditions that can present similarly to ABCD. Drug-induced hyperpigmentation can present from use of antimalarials, chemotherapy agents, antibiotics, amiodarone, and heavy metals.[8] A thorough drug history of our patient rules out the possibility of drug-induced hyperpigmentation. Solar lentigines present similarly to ABCD with increased melanin pigment in keratinocytes and an increase in melanocytic density, yet with elongated rather than blunted rete ridges. Our histopathology showed a similar pattern, however solar lentigines commonly range from a few millimeters to several centimeters in size, whereas our patient had drastically larger areas of pigmentation.[8] Further, the bilaterality of the hyperpigmentation makes ABCD more likely. Pigmented contact dermatitis presents with hyperpigmentation arising after skin contact with an irritant. However, histologically, pigment incontinence and basal liquefaction degeneration are seen.[8] Lastly, postinflammatory hyperpigmentation, a common sequela of certain inflammatory disorders, is a form of hyper-melanosis that displays intense pigmentation in the upper dermis, a decrease in epidermal pigmentation, and perivascular lymphocytic infiltrate.[9]

Treatment for this disorder is not well studied, and more research is needed to determine the most effective therapy. Established forms of treatment for other pigmentary disorders such as chemical peels, laser therapy, topical de-pigmenting agents, or nonablative fractional laser may be effective.[10] Strict photoprotection is also recommended.

CONCLUSION

We report a case of a 53-year-old postmenopausal woman with a history of melanoma, suggesting chronic sun exposure, and no history of hypertension presenting with bilateral hyperpigmentation of the dorsal forearms for 5 months, determined to be ABCD. This case suggests that additional reports will be needed to determine if there are other factors at play, such as the role of the MITF pathway, that could explain the etiopathogenesis of this condition and to understand if a history of melanoma plays any role.

Conflicts of interest

None disclosed.

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