Multispectral Dermatoscopic Features of Chemical Leucoderma with Pigmented Contact Dermatitis

Abstract

Chemical leukoderma is characterized by pigment loss on constant exposure to chemical agents. Its association with pigmented contact dermatitis is rare. Here, we report a 40-year-old female presenting with depigmented macule with surrounding hyperpigmentation over the upper forehead. We used a multispectral dermatoscope by which decreased pigment network was better visualized with blue light, and gray granular dots were better appreciated with yellow light. Shorter wavelengths delineate epidermal features better whereas longer wavelengths highlight dermal features in multispectral dermatoscopy.

Keywords: *Chemical leucoderma, dermatoscope, pigmented contact dermatitis*

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Introduction

Chemical leucoderma, also known as occupational or contact leucoderma, is an acquired hypopigmentary disorder induced by repeated usage of routine domestic products due to pigment blockade, decreased melanin synthesis, and melanocyte destruction.[1] Chemical leucoderma is a better term because lesions are usually not confined to the site of contact, pathogenesis is not similar to contact dermatitis, and is commonly induced by nonoccupational day-to-day household products. Common inducers include derivatives of phenol, para-phenylenediamine, mercury, arsenic, cinnamic aldehyde, corticosteroids, retinoids, otic preparations, and systemic medications (chloroquine, fluphenazine).[2]

Chemical leucoderma has been rarely reported to occur along with pigmented contact dermatitis.[3] Pigmented contact dermatitis is a type of noneczematous contact dermatitis originally described by Osmundsen[4] in a series of patients presenting with pigmentation due to optical whitener in washing powder. It is commonly caused by fragrances, textiles, cosmetics, hair color, and toiletries. The allergen concentration causing pigmented contact dermatitis is too low to cause spongiotic dermatitis and instead causes basal cell cytolysis and pigment incontinence, presenting clinically as reticulate brownish or slate gray pigmentation.[5]

Case Report

A 40-year-old female from Jharkhand, India presented with a history of depigmented macule over the forehead with atrophy and surrounding hyperpigmentation [Figure 1a] for the past 1 year. She also complained of depigmented macules over the lips [Figure 1b], vulva, and legs for the past 10 years. She gave history of a custom of application of sindhur (kumkum) over the upper part of the forehead as well as hair color application.

We used a multispectral dermatoscope which gives a 10× magnification (Dermlite DL II Multispectral, 3Gen Inc, USA) which emits light at three wavelengths viz. 470 nm, 580 nm, 660 nm corresponding to blue, yellow, and red color, respectively. Images were captured using Nikon1 AW1 (14.1 MP mirrorless camera, Nikon Corp., Tokyo, Japan). The features seen under white light included blotchy erythema, linear irregular vessels, decreased pigment network, gray granular dots, blotches, and target structures [Figure 2]. Blue light highlights superficial features [Figure 3] whereas yellow light defines deeper findings [Figure 4].

Patch testing was performed using the Indian Standard series of allergens

How to cite this article: Nirmal B, Santhikiran B, Mukhopadhyay S. Multispectral dermatoscopic features of chemical leucoderma with pigmented contact dermatitis. Indian Dermatol Online J 2018;9:107-9.

Received: April, 2017. **Accepted:** November, 2017.

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Access this article online

Website: www.idoj.in

DOI: 10.4103/idoj.IDOJ_104_17

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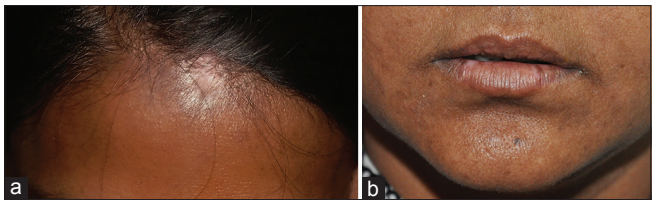

Figure 1: (a) Depigmented macule with surrounding hyperpigmentation over the sindhur region of the forehead. (b) Depigmented macules over the lips

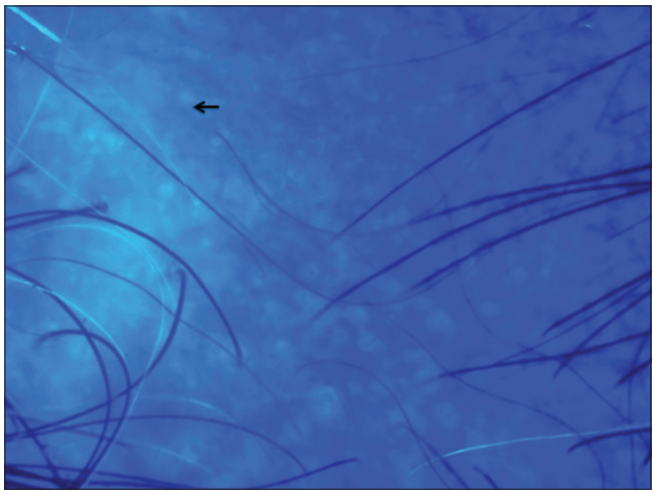

Figure 3: Blue light dermatoscopy (470 nm, 10×): Highlights discontinuity in pigment network (thin arrow)

(Systopic Pharmaceutical Ltd, India) approved by the Contact and Occupational Dermatoses Forum of India (CODFI), and showed 2+ for paraphenylenediamine (PPD) at 48 and 96 h. Histopathology of the forehead lesion, which included both hypo and hyperpigmented areas, showed epidermal atrophy with flattening of rete ridges, reduction of pigmentation of basal layer, basal cell vacuolation with occasional necrotic keratinocytes, band-like moderately dense lymphohistiocytic infiltrate, and pigment incontinence [Figure 5].

Discussion

Incidence of chemical leucoderma in developing countries is increasing with the use of poorly regulated daily usage of products.[6] The term chemical vitiligo is used to denote distant spread of depigmented lesions even after stopping exposure to the offending substance for 1 year where the offender triggers the initiation of autoimmunity resulting in the development of vitiligo. Chemical leucoderma occurring in individuals with pre-existing vitiligo may have a vitiligo diathesis, as in our patient.[7] Kumkum is a powder applied in the Hindu tradition over the centre of the forehead to denote the marital status of a woman. The chemicals in kumkum include azo dye, toluidine red, erythrosine, fragrance, turmeric powder, paraben, and groundnut oil. The positive patch test to PPD in our patient can be explained by its crossreactivity to azo dye in kumkum or a reactivity to PPD in hair color.[8]

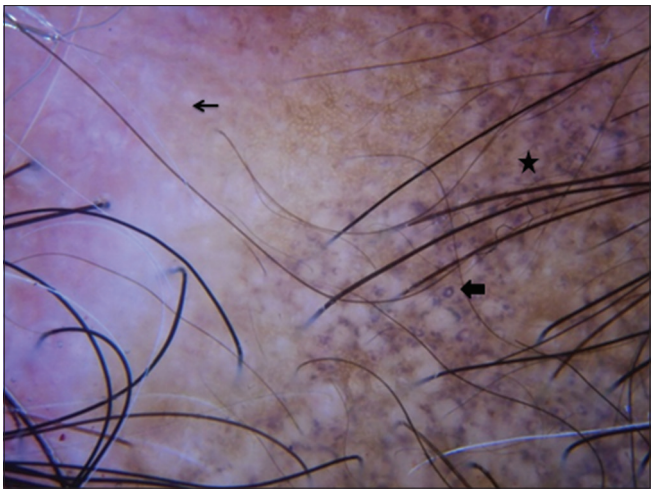

Figure 2: White light dermatoscopy (10×): Blotchy erythema, linear irregular vessels, decreased pigment network (thin arrow), gray granular dots (star), blotches, and target structures (thick arrow)

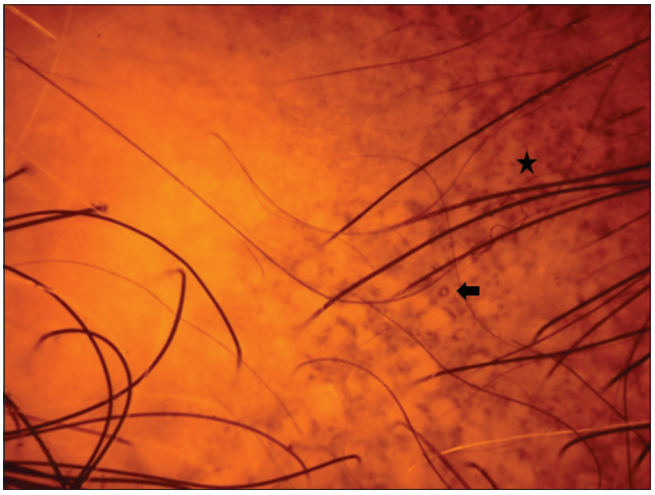

Figure 4: Yellow light dermatoscopy (580 nm, 10×): Highlights grayish granular dots, globules (star), and target structures (thick arrow)

Hyperpigmentation can sometimes be the only presenting sign of contact dermatitis developing as a result of inflammation at the dermoepidermal junction causing pigment incontinence from the basal layer to the upper dermis.[9] Dermatoscopic features described in pigmented contact dermatitis include pseudonetwork, gray dots or granules, telangiectatic vessels, flour-like scales, and perifollicular whitish halo.[10]

The loss of continuity of the pigment network corresponds to the loss of melanin from the basal layer of the epidermis owing to chemical leucoderma seen clearly with 470 nm blue light of the multispectral dermatoscope. The grayish granular dots and blotches correspond to melanin incontinence in papillary dermis, and hence, more evident with 580 nm yellow light of the multispectral dermatoscope. This is because higher wavelength yellow light penetrates deeper when compared to the lower wavelength blue light.

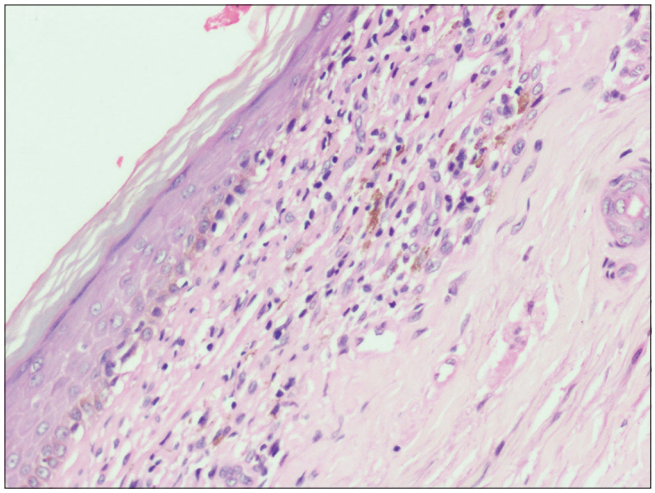

Figure 5: Hematoxylin and eosin section (400×) shows basal cell vacuolation, loss of basal pigmentation in the epidermis, and band-like inflammatory basal pigmentation is there infiltrates with pigment-laden macrophages in the superficial dermis

Dermatoscopy of chemical leucoderma with pigmented contact dermatitis has not been reported in the literature. Features of chemical leucoderma are superficial and better seen at 470 nm. The features of pigmented contact dermatitis are deeper and better seen at 580 nm, which are invisible to superficial penetrating blue light. Though features of both chemical leucoderma and pigmented contact dermatitis on dermatoscopy are visible under white light, multispectral dermatoscopy has an advantage by highlighting superficial changes with blue light and deeper changes with yellow light.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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