IJD Case Report

Spectacle frame induced chemical leucoderma: A case report

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Chemical leucoderma is an acquired hypopigmented dermatosis caused by repeated exposure to specific chemical compounds, notably the aromatic or aliphatic derivatives of phenols and catechols which are commonly present in the rubber and plastic materials. Herein, we report a case of chemical leucoderma in a 55-year-old male, appearing bilaterally over the retroauricular areas, which appeared after of the use of a new spectacle frame by the patient. The patch test results with Indian Standard Series and Cosmetic Series were negative. Chemical leucoderma following the use of materials like hair dyes, and rubber shoes or gloves is common but only a few cases of leucoderma with spectacles have been reported in the literature to date.

Keywords: chemical leucoderma, spectacle frame, phenol, plastics

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INTRODUCTION

Chemical leucoderma is an acquired hypopigmented dermatosis caused by repeated exposure to specific chemical compounds, usually without any preceding signs of inflammation. The most commonly implicated chemical substances inducing chemical leucoderma include certain aliphatic and aromatic derivatives of phenols and catechols, *p*-phenylenediamine (PPD), certain azo dyes, sulfhydryls, mercurials, arsenic, and numerous chemically related drugs [1]. These chemicals are present in a variety of day-to-day products like hair dyes, plastics, rubber/leather products like shoes, belts, gloves, condoms, etc. and may induce leucoderma at the site of contact [2]. Herein, we report a case of chemical leucoderma in a 55-year-old male, appearing bilaterally over the retroauricular areas after the use of a new spectacle frame by the patient.

CASE REPORT

A 55-year-old male presented to us with a three-month history of depigmentation appearing bilaterally over both retroauricular areas. The lesions were asymptomatic and gradually progressive, and were not preceded by any history of itching or erythema at the site. The patient gave a history of using a new spectacle frame for the past six months. There was no past history of any similar hypo- or depigmented lesion at any other body site, nor was there any similar family history of vitiligo. Examination revealed the presence of well defined areas of depigmentation, symmetrically involving both retroauricular areas with no signs of inflammation (Figure 1). No other hypo- or depigmented lesions were present at any other body site. The location of the lesions corresponded to the contact sites of the spectacle frame.

On the basis of history and clinical examination, and the absence of any personal or family history of vitiligo and hypo- or depigmented lesions at any other body site, a diagnosis of spectacle frame induced chemical leucoderma was made. Standard patch testing was done with the Indian standard series and cosmetic series of allergens and the test results were read after 48 and 72 hours in accordance with the recommendations of the International Contact Dermatitis Research Group [3]. The patch test was negative at 48 and 72 hours and topical 0.1% tacrolimus ointment was started for the patient but no repigmentation was observed after six weeks of therapy.

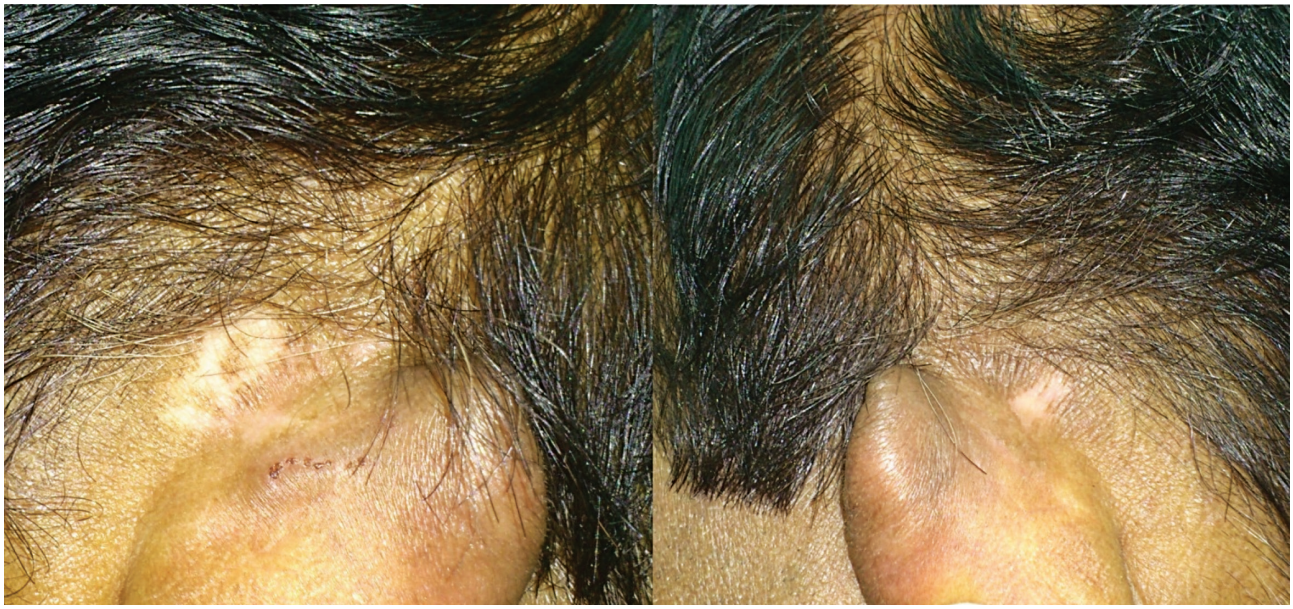

Figure 1. Presence of well defined areas of depigmentation, symmetrically involving both retroauricular areas with no signs of inflammation.

DISCUSSION

Chemical leucoderma was first described by Oliver *et al.* [4] in 1939 in workers using 'acid-cured' rubber gloves in a leather manufacturing company, and monobenzyl ether of hydroquinone (MBH), an antioxidant used in the rubber industry, was identified as the offending agent. Since then, numerous chemicals have been identified to cause chemical leucoderma and a large variety of objects containing these chemicals have been reported to induce chemical leucoderma. In a study of 864 cases of chemical leucoderma by Ghosh *et al.* [2], hair dyes, perfumes/deodorants, detergents/cleansers, rubber sandals, shoes, and cosmetics like eyeliners, lip liners, and lipsticks were the most common causative consumer agents and PPD, para-tertiary butyl phenol and monobenzyl ether of hydroquinone were the most commonly implicated chemical agents. The pathogenesis of chemical leucoderma has been hypothesized to be a genetically determined fragility of melanocytes which are more susceptible to injury and undergo apoptosis on exposure to the offending chemical. A genetic inability of melanocytes to tolerate oxidative stress has been suggested as the molecular basis of melanocyte damage on chemical exposure [5,6].

Clinically, chemical leucoderma resembles vitiligo but the history of repeated exposure to the offending agent and localization at the site of contact favor a diagnosis of chemical leucoderma. Ghosh *et al.* [2] proposed a set of diagnostic criterion for the diagnosis of chemical leucoderma, which include the following:

a. acquired vitiligo-like lesions
b. history of repeated exposure to specific chemical compounds
c. patterned vitiligo-like macules conforming to the site of exposure
d. confetti macules.

The presence of any three of the four confirms a diagnosis of chemical leucoderma. The presence of three of the diagnostic criteria in our case confirmed a diagnosis of spectacle frame induced leucoderma.

Chemical leucoderma to the spectacle frame is a rarely reported entity with only two cases reported in the literature to date [7,8]. Spectacle frames are usually made of metal, plastic, or rubber. A large number of allergens have been implicated in cases of allergic contact dermatitis associated with spectacle frames. The most commonly reported causative agents include metals (nickel, cobalt, chromium, palladium, and gold), resins and plasticizers (acrylates, phthalates, tricresyl and triphenyl phosphate), ultraviolet stabilizers (resorcinol and resorcinol monobenzoate, phenyl salicylate), and dyes [9].

Treatment options for chemical leucoderma include discontinuation of the offending agent along

with topical modalities like steroids, tacrolimus and phototherapy for the involvement of larger areas. Non-responding areas may be managed surgically with skin grafts or melanocyte transfer [1].

In conclusion, chemical leucoderma is a common entity which may mimic vitiligo. A correct diagnosis is important as therapeutic modalities along with a strict avoidance of offending agent impart a better prognosis than vitiligo.

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