Erythema Multiforme due to Diphenylcyclopropenone

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A 34-year-old man visited our hospital with alopecia areata on the occipital scalp, which began to develop two months prior to his visit. He was sensitized with 0.2% diphenylcyclopropenone(DPCP) in acetone that was applied to the inner side of his right arm. Two weeks after sensitization, we applied DPCP on his bald lesion once weekly for skin challenge. Following the third application of DPCP, polycyclic erythematous target-like lesions developed around the sensitized area. A clinical diagnosis of erythema multiforme was made. Histologically, the target-like lesion showed few eosinophilic dyskeratosis, exocytosis, and hydropic degeneration of basal layer in the epidermis, and mononuclear infiltration around superficial blood vessels in the dermis.

We report herein a rare case of erythema multiforme following topical application of DPCP in the treatment of alopecia areata. This complication must be noted because of the widespread and frequent use of DPCP in dermatotherapeutic fields.

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Key Words : Diphenylcyclopropenone(DPCP), Erythema multiforme

Diphenylcyclopropenone(DPCP) is a potent contact allergen widely used in the therapy of alopecia areata[1-4] and recalcitrant warts[5,6]. The therapeutic effect of topical immunotherapy with DPCP is induction of mild allergic contact dermatitis. Itching, erythema and scaling are inevitable or even 'desired' side effects. But, unwanted side effects are sometimes noted such as contact urticaria, pigmented abnormalities, and generalized eczema[7,8]. Erythema multiforme-like reactions following topical DPCP treatment for alopecia areata have been previously reported[2,9,10] with an estimated incidence of 1.2%[4]. This complication must be fully noted because topical immunotherapy with DPCP is becoming increasingly popular among dermatologists.

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We report a case of erythema multiforme induced by topical application of DPCP. This eruption represents a rare side effect which can be controlled with corticosteroids given both systemically and topically.

REPORT OF A CASE

A 34-year-old man visited our hospital with alopecia areata, which began to develop two months prior to his visit. His past medical and family histories were unremarkable. On physical examination, a typical round bald patch (3 X 3 cm) was found on the occipital area of his scalp. Laboratory tests showed normal or negative CBC, LFT, urinalysis, EKG, chest PA, and VDRL.

He was sensitized with 0.2% diphenylcyclopropenone(DPCP) in acetone that was applied to the inner side of his right arm. Two weeks after sensitization, we applied DPCP on the lesion of his scalp once weekly at concentrations of 0.001, 0.001, and 0.005%, respectively. Following the third challenge of DPCP, erythematous target-like lesions initially localized to the area of sensitization,

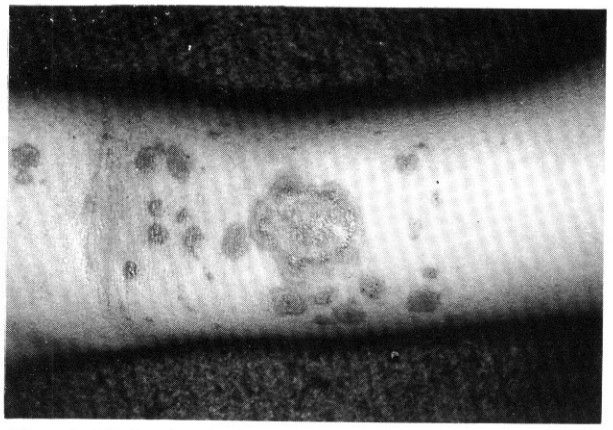

Fig. 1. Multiple erythematous target-like lesions developed around the previously sensitized area following the third application of DPCP.

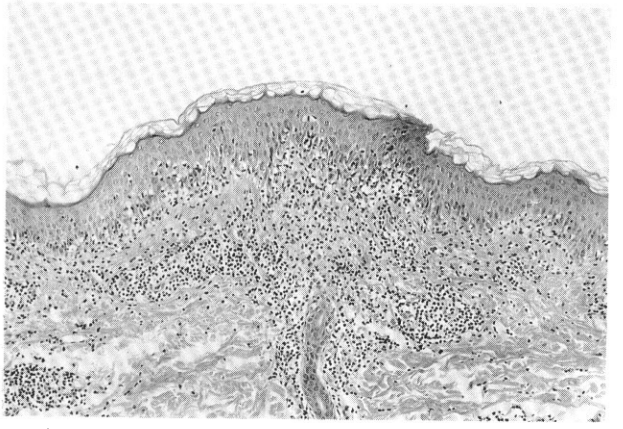

Fig. 2. A few eosinophilic dyskeratosis, exocytosis, vacuolar degeneration of basal layer in epidermis, and perivascular mononuclear infiltrate in dermis (H & E stain. × 100).

and then spread to neighboring sites of the arm(Fig.1). Histopathological examination of a 4-mm punch biopsy specimen obtained from a target-like lesion on the patient's right arm revealed basal layer liquefaction, few eosinophilic dyskeratosis, some degree of dermal edema, and a perivascular mononuclear infiltrate with focal exocytosis(Fig. 2).

The patient was treated with both oral and topical corticosteroids and the lesions of erythema multiforme cleared within 2 weeks. But, there was no hair regrowth in the bald lesion. The patient refused to undergo patch testing and was lost to follow-up.

DISCUSSION

The classic reaction to contact allergens is eczema. Occasionally, however, other types of lesions are seen such as contact urticaria, pigmented abnormalities, generalized eczema and erythema multiforme[7-9].

Contact allergens producing erythema multiforme-like reactions include plants, exotic woods, chemical compounds, and various topical medications10,11. These reactions are usually seen superimposed on acute allergic contact dermatitis. They can be localized to the site of application of the sensitizer, be generalized, or can be associated with systemic manifestations, and can even lead to a fatal outcome[10]. In our patient, erythema multiforme initially localized to the area of sensitization, and then spread to neighboring sites of the arm.

Diphenylcyclopropenone (DPCP) has been used widely as a topical immunotherapeutic agent for the treatment of alopecia areata[1-4] and warts[5,6]. It is less mutagenic and oncogenic than dinitrochlorbenzene (DNCB), and is more stable than squaric acid dibutyl ester (SADBE)[7]. Its side effects are noted, including itching, erythema, contact eczema, regional lymphadenopathy, contact urticaria and pigmentary disturbance[2,3,8].

Erythema multiforme due to DPCP is very rare, and only a few cases have been reported in the literature[2,9,10]. Puig et al[10] reported erythema multiforme-like eruption due to topical DPCP which developed after third challenge of DPCP. These results were the same as the results in our case. Following an erythema multiforme-like eruption, contact immunotherapy must be discontinued and an alternative contact allergen might be tried with caution, since this type of reaction has also been reported following contact immunotherapy of alopecia areata with DNCB[12], and SADBE is not devoid of severe adverse effects[13].

Dermatologists should be aware of the possible adverse reactions in patients receiving topical immunotherapy with DPCP because of the widespread and frequent use of DPCP in dermatotherapeutic fields.

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