



Case Report

An itchy erythematous temporary holiday tattoo

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ABSTRACT

Temporary henna tattoos are very popular among travelers visiting Southeast Asia as they are cheap, safe, easy to remove, and not painful. A potent allergen, paraphenylenediamine is usually added to the henna to give a darker, more appealing color and to speed up the dyeing process. Herein, a case of allergic contact dermatitis in a temporary tattoo in a 35-year-old Malaysian Chinese man is reported. Two weeks after the tattoo was applied in Bali, he presented with pruritic, erythematous, weepy vesiculopapules on the tattooed area and the surrounding skin, which had been present for a week. A patch test showed a 2+ allergy to paraphenylenediamine and he was treated with antihistamines and oral and topical steroids. His skin lesions resolved in 2 weeks, leaving postinflammatory hyperpigmentation. He was advised to avoid temporary tattoos and hair dyes in the future.

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1. Introduction

Skin painting with henna tattoos has been used by Muslims and Hindus in Southeast Asia for centuries. Recently, street artisans have adopted henna for the art of temporary tattooing. The temporary tattoos are very popular among travelers visiting Southeast Asia as they are cheap, safe, easy to remove, and not painful [1]. Street artisans commonly add other ingredients, such as paraphenylenediamine (PPD), to the natural red henna to give a darker, more appealing color and to speed up the dyeing process. Allergic contact dermatitis to these added ingredients, especially PPD, is being increasingly reported although true allergy to henna is rare [2]. Herein, a case of allergic contact dermatitis in a temporary tattoo caused by PPD is reported.

2. Case report

A 35-year-old Malaysian Chinese man presented with redness and itchiness on a temporary holiday tattoo applied by a beach artist in Bali 2 weeks earlier. He was told by the beach artist that the dye was made of henna, a vegetable extract, with a black darkening agent that is safe, and it would last approximately 2 weeks. One week after application, he noticed erythema and pruritus on the

tattoo. The redness and itching progressively worsened to involve the surrounding skin. He had no personal or family history of atopy or allergy. He denied previous exposure to hair dye. Examination showed erythema, vesicles, and weeping following the pattern of the tattoo (Fig. 1). There was also an erythematous maculopapular rash surrounding the tattoo. A diagnosis of allergic contact dermatitis in the henna tattoo, possibly because of the darkening agent, was made.

He was prescribed oral prednisolone 0.5 mg/kg daily for 1 week, oral antihistamines, and topical corticosteroids. The skin lesion resolved but postinflammatory hyperpigmentation was seen on a follow-up visit 2 weeks later. A month later, a patch test with the European Standard Series (Trolab Hermal, Reinbek, Germany) was performed. The patch test was mounted on the patient's back using Finn chambers (Norgesplaster Aksjeselskap, Vennesia, Norway) on scanpor tape (Epitest Ltd. Oy, Tuusula, Finland) for 48 hours. The first reading was done at 48 hours and the second reading at 96 hours. It showed a 2+ positive reaction to PPD based on the recommendations of the International Contact Dermatitis Research Group. Unfortunately, he refused a second patch test to natural henna. Based on the history that a darkening agent had been added to the henna tattoo, a diagnosis of allergic contact dermatitis to the darkening agent, most likely PPD, in the henna tattoo was diagnosed. He was advised to avoid PPD especially in black hair dyes and temporary tattoos in the future.

3. Discussion

Henna is a natural red pigment from the leaves of *Lawsonia inermis* [3]. The active ingredient is lawsone (2-hydroxy-1,4-

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Fig. 1. Erythematous, weepy vesiculopapules on the tattooed area on the left leg.

naphthoquinone) [2]. Henna paste for use on the skin and to color hair can be made by adding water or oil to ground fresh henna leaves or the powder from ground dry henna leaves [2,4]. Coffee, black tea, cloves, lemon juice, eucalyptus, mustard oil, PPD, beet root juice, nut shells, sugar, turpentine, and animal urine are all used to darken the paste [2,3]. Street artisans also commonly add colorizing agents, for example, diaminotoluenes and diaminobenzenes; and heavy metals, for example, cobalt, mercury, nickel, chromium, and lead, for more appealing colors [2,5,6]. The dyeing process with pure henna usually takes approximately 6 hours, but the addition of ingredients, such as PPD, shortens the period to only 30 minutes [4].

Allergy to pure henna is rare [4,6]. Kazandjieva et al. [2] found that none of 31 patients with allergic contact dermatitis to temporary tattoos had an allergy to pure henna. However, 6% had an allergy to henna mix and 87% had an allergy to PPD. Akhras et al. [7] also found that 83% of the 58 cases reported before 2005 had a PPD allergy. Similarly, Onder [1] in Turkey, Ramirez-Andreo et al. [3] in Spain, and Chung et al. [8] in Taiwan found that all their patients with allergies from temporary tattoos had a PPD allergy on patch testing.

PPD or 1,4-diaminobenzene is an aromatic amine with low toxicity and is commonly used in the hair dye industry [2]. It is a common allergen of the skin and respiratory tract. Oxidation of

PPD (prohaptan) to quinine diamine (haptan) in the skin causes direct reaction with a protein, an essential process for sensitization in susceptible individuals, and later allergic contact dermatitis [2].

The incubation period is usually 7 to 20 days [2]. However, it can be as short as 24 to 48 hours with prior sensitization, most commonly because of previous hair dye exposure or exposure to a cross sensitizer of PPD, such as sulphonamides, sulfonyleureas, benzoic acids, azo dyes, and benzocaine [2].

In most cases of PPD allergy in temporary henna tattoos, a Type IV hypersensitivity allergic contact dermatitis has been reported [1,2,8]. However, a Type IV hypersensitivity reaction causing lichenoid reactions and erythema multiforme-like lesions has also been seen [1,9,10]. Rarely, the PPD allergy can present with angioedema, a Type I hypersensitivity reaction [11]. The consequences of allergic contact dermatitis are prolonged postinflammatory hypopigmentation or hyperpigmentation, and sensitization to PPD and its related compounds, particularly lifelong allergy to hair dyes and dyschromic scars [1,2,8].

In conclusion, temporary tattoos are hazardous and cause unnecessary morbidities. The use of temporary henna tattoos among street artisans should be regulated. Tourists should be educated on the consequences of temporary henna tattoos by tour guides and agencies before they embark on the creation of these tattoos on their skin.

References

- [1] Onder M. Temporary holiday "tattoos" may cause lifelong allergic contact dermatitis when henna is mixed with PPD. *J Cosmetic Dermatol* 2003;2: 126–30.
- [2] Kazandjieva J, Grozdev I, Tsankov N. Temporary henna tattoos. *Clin Dermatol* 2007;25:383–7.
- [3] Ramirez-Andreo A, Hernández-Gil A, Brufau C, Marín N, Jiménez N, Hernández-Gil J, et al. Allergic contact dermatitis to temporary henna tattoo. *Actas Dermosifiliogr* 2007;98:91–5.
- [4] Oztas MO, Onder M, Oztas P, Atahan C. Contact allergy to henna. *J Eur Acad Dermatol Venereol* 2001;15:91–2.
- [5] Jovanovic DL, Slavkovic-Jovanovic MR. Allergic contact dermatitis from temporary henna tattoo. *J Dermatol* 2009;36:63–5.
- [6] Polat M, Dikilitas M, Oztas P, Alli N. Allergic contact dermatitis to pure henna. *Dermatol Online J* 2009;15:15.
- [7] Akhras V, Ostlere L. Is patch testing for PPD routinely necessary in patients with reactions to henna tattoos? *Contact Dermatitis* 2005;53:238.
- [8] Chung W, Wang C, Hong H. Allergic contact dermatitis to temporary tattoos with positive para-phenylenediamine reactions: report of four cases. *Int J Dermatol* 2001;40:754–6.
- [9] Schultz E, Mahler V. Prolonged lichenoid reaction and cross-sensitivity to para-substituted amino-compounds due to temporary henna tattoo. *Int J Dermatol* 2002;41:301–3.
- [10] Jappe U, Hausen BM, Petzoldt D. Erythema-multiforme-like eruption and depigmentation following allergic contact dermatitis from a paint on henna tattoo, due to paraphenylenediamine contact hypersensitivity. *Contact Dermatitis* 2001;45:249–50.
- [11] Abdulla K, Davidson N. A woman who collapsed after painting her soles. *Lancet* 1996;348:658.