

# Painful Skin Lesions on the Hands Following Black Henna Application

What's the diagnosis?

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A 14-year-old adolescent girl presented with painful skin lesions on the dorsal aspect of the hands of 10 days' duration. She reported having received red henna tattoo on the palmar surface of the hands and black henna tattoo on the dorsal surface of the hands 1 day prior to development of the lesions. Within 1 day of receiving the tattoo, she developed pruritus, blisters, and pain on the dorsal aspect of the hands. The palms were unaffected. Physical examination revealed erythematous, brown to black bullae and crusts that followed the contours of the henna design on the dorsal aspect of the hands. There were orange and brown henna designs on the patient's palms, but no erythema, bullae, or induration was noted.

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## The Diagnosis: Allergic Contact Dermatitis to Para-phenylenediamine

To darken the color of henna and increase penetration and staining, para-phenylenediamine (PPD) is added.<sup>1</sup> Allergic contact dermatitis is the most common type of hypersensitivity to PPD.<sup>2</sup> A retrospective study that examined severe adverse events from applying henna dyes in children found that angioedema of mucosal tissues was the most common severe adverse event; others included renal failure and shock.<sup>3</sup>

Black henna is associated with multiple cultural practices. For example, Indian weddings contain a henna decoration ceremony for the bride based on the belief that the longer the henna lasts, the longer the marriage lasts. Black henna is favored for this practice, as it lasts longer than red henna.

Henna (*Lawsonia inermis*) is a plant that contains the molecule lawsone (naphthoquinone). Lawsone has an intense affinity for keratin; as a result, lawsone is frequently added to temporary body tattoos and hair dyes to create a relatively permanent change in skin or hair color.<sup>4</sup> Henna is mixed with hennotannic acid to release the lawsone from the plant. Lawsone and hennotannic acid rarely cause allergic reactions.<sup>1,5-7</sup> Once applied to skin, henna takes a few hours to dry, and the resulting color is orange to red.<sup>8</sup> Often, PPD is added to henna paste to create a black color, to speed up the drying process, and to increase its longevity.

Para-phenylenediamine has been repeatedly reported to cause allergic contact dermatitis. We describe a case of allergic contact dermatitis secondary to PPD in black henna. Our patient is a clear example



Red henna tattoo on the palmar surfaces of the hands.

that PPD is the allergen in black henna given that there was no reaction to the natural red henna tattoo that was applied at the same time to the palmar surfaces of the hands (Figure). Aside from the bullous reaction to black henna dye described here, other reported presentations include erythema multiforme-like and exudative erythema reactions.<sup>9,10</sup>

Contact dermatitis lesions from black henna dye can be treated with topical corticosteroids. Patients may develop residual postinflammatory hyperpigmentation or hypopigmentation, leukoderma, keloids, or scars.<sup>1,11,12</sup>

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