

# Cutaneous hyperpigmentation following nonpermanent henna tattoo

Iqbal A. Bukhari, MBBS, FD (KFU).

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## ABSTRACT

Decorative henna skin painting can provoke severe reactions in the skin. We report 3 cases of unusual and persistent hyperpigmentation following nonpermanent henna tattoo, which alerted us to identify an additional side effect.

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**H**enna (*Lawsonia inermis*) is one of the most common vegetable dyes used to decorate the palms, feet, fingers, nails and scalp in females or even the beard in males. It is used as part of the religious and social traditions in some Arabian communities. The powder is usually mixed with water, tea, yogurt or even coffee to enhance its weak coloring effect. The thick paste is then applied on the skin or the hair for 30 minutes or longer and washed off afterwards. Naphthoquinone is the active ingredient, which gives the red-brown coloring effect while paraphenylenediamine (PPD) or indigo blue are frequently added to darken the lawsone stain.<sup>1</sup> The color of henna is expected to last from few days to weeks. Contact sensitization to PPD has been reported frequently ranging from allergic contact to immediate type hypersensitivity reactions,<sup>2,3</sup> while reactions to henna has rarely been reported.<sup>4,8</sup> The present report describes 3 cases of cutaneous hyperpigmentation following nonpermanent henna tattoo.

**Case Reports.** *Patient one.* A 22-year-old Saudi female of skin type III presented with light brown decorated lines on both arms of 6 months

duration. The patient recalled applying dark brown henna paste prepared at a beauty saloon on her arms 6 months ago, which later faded and persisted as light brown with no occurrence of any skin irritation. Her past medical history did not reveal the tendency to have post inflammatory pigmentary changes following any skin injury. Wood's light examination of the area revealed dermal type of pigmentation. A standard patch test was performed using True test (Mekos Laboratories, Denmark) with a series of 24 allergens revealed negative reaction to PPD. Biopsy from the lesion showed normal epidermis and dermis with mild pigmentary incontinence in some areas. There was no inflammatory infiltrate or abnormal deposits in the dermis. So, the most likely diagnosis was permanent henna tattoo caused by unknown henna additives.

*Patient 2.* A 19-year-old Saudi female of skin type III presented with brown decorated lines on both arms of 9 months duration. The patient remembered applying ready made henna paste on her arms without the occurrence of any skin irritation. The original color was dark brown but faded later and persisted as light brown color (Figure 1). There was a negative history for post

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From the Department of Dermatology, King Faisal University, College of Medicine, Dammam, Kingdom of Saudi Arabia.

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Address correspondence and reprint request to: Dr. Iqbal A. Bukhari, King Fahad Hospital of the University, PO Box 40189, Al-Khobar 31952, Kingdom of Saudi Arabia. Tel. +966 (3) 8957886. Fax. +966 (3) 8949209. E-mail: consultant@dermatologyclinics.net



**Figure 1** - Brown pigmentation confined from previous henna tattoo.



**Figure 2** - Permanent dusky red staining of the skin confined from previous henna tattoo.

inflammatory hyperpigmentation following any skin injury in the past. Wood's light examination of the area revealed dermal type of pigmentation. The True patch test was used and showed negative results for PPD. So, the final diagnosis was also permanent henna tattoo.

**Patient 3.** A 16-year-old Saudi female of skin type III presented with dusky red to brown decorated lines on both arms for one year. The patient condition started when she applied ready made henna paste on her arms at a beauty saloon. Few days later, she noticed that the original color had faded but it left dusky red color at the same site of the decoration with no change in the surface of the skin, which persisted for one year without any change in the degree of color (**Figure 2**). She denied any history of dermatitis or even slight itching at that site. There was a negative history of post inflammatory hyperpigmentation tendency in the past. Wood's light examination of the area revealed dermal type of pigmentation. The True patch test result was negative for PPD. So our most likely diagnosis was permanent tattoo induced by unknown henna preparation.

**Discussion.** The 3 cases in this report represent a unique newly reported reaction to henna paste, which is was staining persistent due to nonpermanent henna tattoo. Possible explanation for this reaction is either those patients might had unnoticed subclinical interface dermatitis caused by henna or its additives other than PPD, which resolved with persistent post inflammatory hyperpigmentation. This may explain the first and the second case, or they were permanently tattooed with a ready made henna paste of unknown ingredients especially if calcium containing additives were present in the mixture of henna, as calcium can enhance the transport of certain

chemicals and in this case naphthoquinone into the epidermal cells leading to the persistence of the color. This may explain the third case. However, skin punch biopsy results in one of those patients support the post inflammatory hyperpigmentation effect. Interestingly, Wohlr et al<sup>9</sup> reported an unusual reaction to henna tattoo in the form of severe allergic reaction resolving with permanent post inflammatory hypopigmentation confined to the area of the henna tattoo but this cannot be compared to our cases who denied any history of dermatitis after the henna application. In the future, patients should be Patch tested for indigo blue, pure lawsone, henna powder and commercially available henna paste to identify if they are allergic to any of them. In India, PPD and other additives are added in undefined percentages to henna,<sup>10</sup> which is commonly imported and used in the Kingdom. Adding to the problem, ladies usually paint their hands at beauty saloons and the imported henna is a dye with no specific trademark or labeling of ingredients, which makes the problem difficult to evaluate and manage clinically. In general, this is an important issue towards the use of imported henna dye, which must be considered by health authorities. Restricting the import of improperly labeled products and educating the public how to use henna powder safely are important steps to implement.

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