

Unusual Erythematous and Infiltrated Plaque

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Figure 1.

A 30-year-old man presented with an erythematous plaque on his left forearm. The plaque began as vesicles and was pruritic. The area was mildly infiltrated and had a particular pattern (*Figure 1*). He had applied an ornamental tattoo five days prior to the development of the rash, and the rash did not spread beyond the border of the tattoo. His medical history was unremarkable.

Physical examination revealed a raised erythematous lesion with a distinct border. The surrounding skin was normal. The patient was treated with a high-potency topical steroid cream. A hyperpigmented

macule persisted for three weeks, but there was no sign of local relapse or neuralgia after six months.

Question

Based on the patient's history and radiologic findings, which one of the following is the most likely diagnosis?

- A. Contact dermatitis.
- B. Herpes zoster.
- C. Koebner phenomenon.
- D. Symptomatic dermatographism.

See the following page for discussion.

Photo Quiz

Discussion

The answer is A: contact dermatitis from *p*-phenylenediamine. Henna is a natural greenish powder obtained from the *Lawsonia inermis* plant, and its allergenicity is low. The use of henna dye is common in many countries. In some countries it has religious significance, whereas in others it is used to create temporary tattoos for recreational or cosmetic reasons.¹ It is also used in combination with other pigmented substances such as *p*-phenylenediamine to darken the color and create the effect of a permanent tattoo. *p*-Phenylenediamine has a high allergenicity and may cause blistering, erythema, dryness, and peeling; it can also cause fatal allergic reactions.²

Patients who have applied black henna tattoos may become sensitized to *p*-phenylenediamine and then cross-react with other para-amino compounds found in hair dyes, cosmetics, black rubber, some textiles, and less commonly local ester anesthetics such as benzocaine. Other long-term sequelae of allergic contact dermatitis from using henna tattoos containing *p*-phenylenediamine may include scars, keloids, hyper- and hypopigmentation, and temporary hypertrichosis.³ Rarely, erythema multiforme occurs, possibly because of percutaneous absorption or ingestion. Red henna is less likely than black henna to cause reactions.

Herpes zoster is caused by the reactivation of latent varicella virus that is dormant in nerve cell bodies. The virus spreads distally along one or several nerves, infecting the corresponding dermatome. The rash is characterized by tender vesicles and blisters, which may become hemorrhagic. Persons who are immunocompromised are at increased risk.

Koebner phenomenon is the development of erythematous lesions that appear along linear lines of trauma. The lesions are clearly defined, red, scaly plaques. Koebner phenomenon is common with psoriasis and also can occur with other chronic diseases and skin conditions, such as lichen planus, vitiligo, lichen sclerosus, and systemic lupus erythematosus.

Symptomatic dermographism is the most common form of physical urticaria and has a prevalence of 2% to 5% in the general population.^{4,5} The shear force occurring at the skin surface as a result of rubbing or scratching produces red, swelling, stripe-shaped wheals that may be accompanied by local itching and burning. Typically, the urticarial lesions occur within seconds to minutes of the causative exposure and may persist for up to two hours.

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Summary Table

Condition	Etiology/associations	Characteristics	Time of onset
Contact dermatitis from <i>p</i> -phenylenediamine	Exposure to <i>p</i> -phenylenediamine, commonly from a henna tattoo	Blistering, erythema, dryness, peeling	2 to 4 days
Herpes zoster	History of varicella infection	Tender vesicles and blisters along a dermatome	2 to 4 days
Koebner phenomenon	Previous cutaneous injury; history of psoriasis	Clearly defined, red, scaly plaques	10 to 20 days
Symptomatic dermographism	Rubbing or scratching, allergic disease	Red, swelling, stripe-shaped wheals	Seconds to minutes