

## Edematous face

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Received: 1 January 2016 / Accepted: 13 January 2016 / Published online: 13 February 2016  
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### Patient presentation

A 22-year-old female without previous history of allergic reaction following exposure to henna presents to the emergency department complaining of 12 h of progressive scalp, forehead, and cheek swelling after hair dye application approximately 36 h earlier. She had her hair dyed once previously without adverse side effects. Patient denies difficulty in breathing, shortness of breath, or swelling of throat or tongue. She further denies nausea, vomiting, abdominal pain, rash, hives, or itching. Physical examination reveals angioedema of the scalp, forehead, and upper cheeks without rash or erythema.

### Discussion

The patient (Fig. 1) has impressive edema of the scalp and forehead following exposure to hair dye (Fig. 2). Allergic reactions to hair dye chemicals are a rare but potentially emergent condition. The most likely etiology is contact dermatitis due to *para*-phenylenediamine (PPD) containing hair dye following previous sensitization. Black henna, a combination of traditional henna and PPD, is most commonly used as a temporary tattoo dye popular among adolescents and young adults.

This reaction is categorized as a delayed type IV hypersensitivity reaction that is T lymphocyte mediated, and usually occurs within 12–48 h following contact with the offending agent [1]. Cases of delayed type IV

hypersensitivity reactions to PPD in hair dye following previous sensitization to black henna are well documented, however, they remain uncommon [2]. An estimated 2.5 % of people exposed to black henna will experience an immediate allergic contact dermatitis reaction [3]. Noting previous exposure to henna is an important consideration for those working in the textile, rubber, and cosmetic industries known to have higher risk for occupational exposure to PPD [4]. The prevalence of delayed hypersensitivity reaction to PPD following sensitization is not well characterized.

The patient was treated with Benadryl, famotidine, and methylprednisolone in the emergency department. After several hours of observation and no progression of edema, she was discharged home with a prescription for Benadryl, a recommendation to avoid contact with PPD containing products, and instructions to follow-up with dermatology if the symptoms persisted.



**Fig. 1** Image of patient's face one week prior to the allergic reaction

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**Fig. 2** Image of patient face demonstrating soft tissue edema around the patient's hairline and extending into her forehead, scalp, and cheek

#### **Compliance with ethical standards**

**Conflict of interest** The authors declare that they have no conflict of interest.

**Statement of human and animal rights** In compliance with ethical standards set forth by our institutional research committee and in compliance with the 1964 Helsinki declaration.

**Informed consent** An informed and written consent was obtained from the patient for this publication.

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