

CASE STUDY

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Hair Extensions: Novel "Source" of a Well-Known Contact Allergen

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A 31-year-old Caucasian woman presented with complaints of pruritic eruption on the site of attachment of hair extensions (Figure 1). Several days after the initial involvement of the site of integration, the process spread on the flexural aspect of the body and the extremities (Figure 2).

On examination, erythematous papules coalescing into plaques and single vesicles were noticed. Excoriations with itching were also observable. The patient had no previous history of skin diseases. Her personal and family histories were positive for allergic rhinitis.

The clinical findings corresponded to contact eczema, and adverse allergic reaction to the adhesive material of the hair extension was suspected. Patch testing was performed with European baseline series, adhesive series, and with the adhesive "as is." Day 2 (Figure 3) and day 3 readings of the patch test revealed positive reaction to paraphenylenediamine. No reaction to the adhesive components or the material itself was observed. The patient dyed her hair many times before; however, no skin reactions were seen until the application of the hair extension.

Removal of the hair extensions was advocated as well as complete avoidance of paraphenylenediamine (PPD)-containing products (mostly hair dyes and colorants). In addition, topical symptomatic treatment with mometasone furoate 0.1% scalp solution and cream was administered for a short period, which resulted in complete clearance of the skin and scalp lesions. During the 3-month follow-up, the patient had no further complaints.

DISCUSSION

Hair extension or integration is a method of adding commercial hair to natural hair when thinning or extensive loss of hair is evident. Different ways of adhesion of the new hair fibers exist, such as sewing, metal and plastic clips, thread, or adhesive. Herein, a case of contact dermatitis after the placement of adhering hair extension is described.

The term scalp dermatitis encompasses a condition with different origins and similar morphologic characteristics as eczema/dermatitis. The most common type of scalp dermatitis is seborrheic, with typical predilection sites and intermittent course. Atopic eczema can affect the capillitium especially in children, with a rate of up to 49% of all infants and adolescents.¹ Recently, the concept of "sensitive scalp" was introduced in analogy to the sensitive skin syndrome on the face: increased stinging, itching, pricking, or burning sensation on the scalp most often without objective symptoms.^{2,3} This condition is overlooked by many dermatologists even though the scalp is the most commonly affected site after facial and hand skin.² Triggering factors include climatic conditions such as cold, heat, dry air, water exposure, hair cosmetics, and emotional stress.⁴ A schematic overview on the causes for scalp dermatitis is depicted in Figure 4.

Contact dermatitis is observed in the scalp although it is not very prevalent. In one study, 22 (4%) of 3684 eczema patients had scalp involvement solely, whereas head and neck involvement was observed in 15%.⁵ No gender predominance can be outlined in contrast to other skin sites of contact dermatitis. In addition, contact allergy is more common than irritant allergy, contrary to the glabrous skin where irritancy is more often observed. Dermatitis on the scalp was negatively associated with polysensitization (odds ratio, 0.66) primarily in individuals without atopic history.⁶ A list of the most common contact allergens and irritants is shown in the Table.

The majority of contact allergic dermatitis cases affecting the scalp region are caused by PPD, a widely used colorant in hair dyes. It is a lay belief, however, that dermatitis caused by hair dyes constituents is restricted to the scalp. The most common sites of contact allergy to hair dyes is not the scalp but the eyelids, frontal line, neck, and ears (Figure 5).⁷ The reason for this phenomenon is not quite clear. A possible explanation could be that the allergen penetrates rapidly through the follicles and there is not enough time for the sensitization and elicitation of dermatitis. In our case,

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Figure 1. Erythema and fine scaling at the sites of contact of the hair extension adhesive to the scalp skin.



Figure 2A. Dissemination of the erythematous papulous eruption to the flexural aspects of the patient's trunk and extremities.



Figure 2B. Dissemination of the erythematous papulous eruption to the flexural aspects of the patient's trunk and extremities.



Figure 3. Positive reaction to paraphenylenediamine on day 2 of the patch testing.

dermatitis caused by PPD was observed on the scalp but not on any other common sites. We hypothesize that the adhesive of the hair extensions served as an occlusive agent and a reservoir for the allergen, which facilitated the elicitation of dermatitis reaction on the scalp and enhanced the secondary dissemination of the eruption. This could explain why the patient, who had dyed her hair many times before, developed the reaction only after the application at the site of the extensions.

CONCLUSIONS

We propose a practical algorithm for the diagnostic approach to the patient with scalp dermatitis (Figure 6). Scalp dermatitis is not a uniform disease, and different causes for eczematous

lesions on the scalp exist; therefore, contact allergy should be excluded as an aggravating or causative factor.

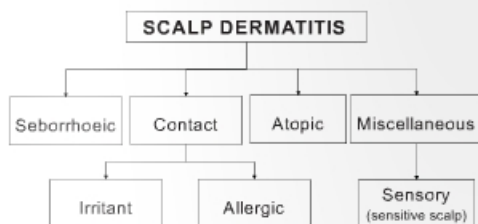


Figure 4. A classification of scalp dermatitis.

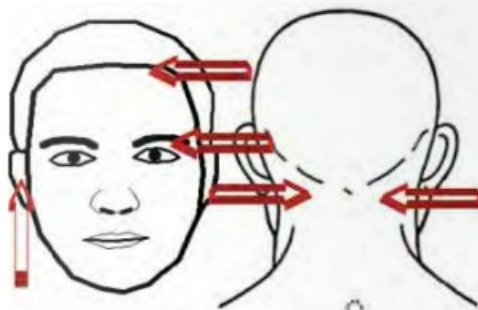


Figure 5. Typical sites of involvement of dermatitis caused by hair dyes.

Table. Contact Irritants and Allergens in Contact Dermatitis of the Scalp

IRRITANTS	ALLERGENS
Tar	Paraphenylenediamine
Dithranol (anthralin)	Thioglycolates (permanent wave solutions)
Minoxidil	Persulfates (hair bleaches)
Hair highlighters (hydrogen peroxide, persulfates, and metasilicate)	Nickel (hair clasps and metal accessories)
Detergent surfactants (shampoos and soaps)	Fragrances, preservatives (MDBG, N, Kathon CG, parabens), emulsifiers in rinse-off products
Plant extracts (eg, <i>Veratrum lobelianum</i> , false hellebores, or corn lilies)	Quinine (hair loss lotions)
	Bovine collagen (hair conditioner)

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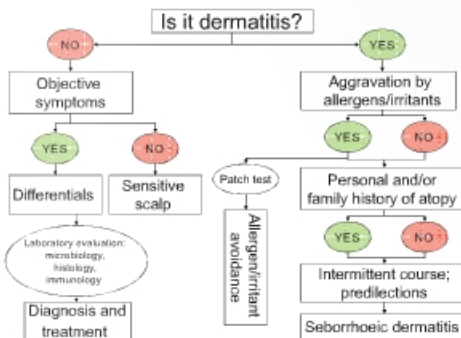


Figure 6. Practical algorithm and diagnostic approach to the patient with scalp dermatitis.