

Contact Alopecia: Improvement of Alopecia with Discontinuation of Fluocinolone Oil in Individuals Allergic to Balsam Fragrance

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Abstract: Inflammatory scalp dermatoses can be associated with alopecia, which is nonscarring and reversible in its early stages. This association has been described in seborrheic dermatitis, psoriasis, and atopic dermatitis. We describe three girls with alopecia aggravated by contact allergy to balsam fragrances. All three had complete resolution with avoidance of balsam of Peru and other balsam derivatives (including discontinuation of fluocinolone oil, which contains balsam of pine).

Allergic contact dermatitis (ACD) is not uncommon in children (1). It is characterized by inflamed, pruritic, erythematous, often scaly plaques in areas of exposure to the culprit allergen. An association between other inflammatory skin conditions (seborrheic dermatitis, psoriasis, atopic dermatitis [AD]) and alopecia has been reported in the literature (2–5). We describe three cases demonstrating resolution of chronic inflammatory dermatitis–associated alopecia through avoidance of balsam derivatives in children allergic to balsam of Peru.

CASE REPORTS

Patient 1

A 14-year-old girl with a history of moderate to severe AD presented for evaluation of generalized dermatitis

and associated alopecia. She had been previously treated with a variety of topical steroids, antibiotic creams, and tacrolimus ointment. She also routinely used fluocinolone oil (Derma-Smoother, Hill Dermaceuticals, Sanford, FL) on her body and scalp. Before contact dermatitis evaluation she had been treated with six courses of systemic prednisone and continued to worsen, with significant hair loss. She was a frequent consumer of chocolate and ketchup.

Patch testing was performed with the American Contact Dermatitis Society Core 80 series and her personal hygiene products, with reads performed at 48, 72, and 96 hours. The reactions were graded as follows: [+] weak positive with erythema, infiltration, and discrete papules; [++] strong positive with erythema, papules, infiltration, and discrete vesicles; and [+++] extreme positive with coalescing vesicles and bullous reaction. The patient was found to have the

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following reactions: [++] to balsam of Peru 25%, [++] to cinnamic alcohol 5%, [++] to colophonium 20%, [++] to coniferyl alcohol 1%, [++] to benzyl alcohol 5%, [++] to Derma-Smoothe (containing balsam of pine), and [+] to cocamidopropylbetaine (CAPB). A simultaneous open application test of Derma-Smoothe with a layer applied to the upper inner arm twice daily for 1 week demonstrated a [+] reaction on day 4.

Patients 2 and 3

Two additional cases are described in Table 1. Photos of patient 2 are presented in Fig. 1.

RESULTS

Protocols of avoidance of balsam fragrance and low-balsam diets were prescribed, along with continuation of topical triamcinolone and tacrolimus ointments. A low-balsam diet consisted specifically of recommendations for avoidance of tomatoes and tomato-containing products (e.g., ketchup, red pizza sauce, spaghetti sauce, chili), spices (e.g., cinnamon, cloves, vanilla), peels of citrus fruits, chocolate, and cola and other spiced sodas (6).

At the 4-week follow-up, all three patients had marked improvement. At the 16-week follow-up, all patients had regrowth of their hair. After clearance, the

first patient systematically rechallenged herself with her perfumed products and sweets, which resulted in a flare of her dermatitis and significant scalp pruritus.

Patient 2 had a positive reaction to bronopol that was of unclear relevance. This reaction to a formaldehyde-releasing preservative might reflect a past relevant exposure to a personal care product containing this ingredient.

DISCUSSION

These three cases describe the potential role of balsam derivatives, specifically balsam of pine, in contact allergy associated with aggravation of atopic alopecia.

There has been a focus in recent literature on an association between alopecia areata and AD (7), although AD and other inflammatory skin conditions can lead to a diffuse-pattern alopecia. Alopecia associated with chronic inflammatory scalp dermatoses is important to recognize, because early stage disease is reversible, although in late stages it can be scarring (2–5). ACD can involve the scalp primarily or be an aggravator of another inflammatory dermatitis such as AD. It is our belief that the patients in our series initially had AD on the scalp, which concomitant ACD secondarily exacerbated, leading to significant inflammatory dermatitis and resultant alopecia.

TABLE 1. *Cases of Balsam Allergy*

Patient	Age, years	Sex	Body surface area, %	Severity of dermatitis	Duration of dermatitis, months	Patch testing	Positive reactions	Treatment	Response
1	14	Female	45	Moderate to severe	8	Comprehensive, repeat open application test	[++] Balsam of Peru 25%, [++] cinnamic alcohol 5%, [++] colophonium 20%, [++] coniferyl alcohol 1%, [++] benzyl alcohol 5%, [++] fluocinolone, [+] cocamidopropylbetaine	Balsam avoidance, triamcinolone and tacrolimus ointment	Excellent improvement in dermatitis and regrowth of scalp hair
2	13	Female	30	Moderate to severe	12	Thin layer rapid use epicutaneous patch test	Balsam of Peru, bacitracin, bronopol, caine mix	Balsam avoidance, triamcinolone ointment	Excellent improvement in dermatitis and regrowth of scalp hair
3	3	Female	12	Moderate to severe	6	N/A	N/A	Balsam avoidance, triamcinolone ointment	Resolution of scalp dermatitis and regrowth of scalp hair

N/A, not available.



Figure 1. A 13-year-old girl with alopecia associated with chronic atopic dermatitis flaring with concomitant allergic contact dermatitis. This is distinct from alopecia areata, as it is a more diffuse process and there is an underlying inflammatory dermatosis with erythematous papules and plaques. Lichenification of the papules indicates a chronic process.

The prevalence of contact sensitization to fragrance chemicals, such as balsam of Peru, has been shown to be higher in patients with AD than controls (8). It is also known that balsam of Peru can cross-react with other balsam derivatives such as balsam of pine—which is an ingredient in a topical treatment commonly used for pediatric scalp dermatitis (Derma-Smoother oil) (9). It is also known that positive test reactions to coniferyl benzoate and benzyl alcohol are associated with consumption of sweets (10), as was seen in the first patient.

It is important for clinicians to be aware of such associations and to evaluate individuals with alopecia for ACD early in the course to prevent irreversible hair loss from protracted inflammation. Although patch testing is the criterion standard for diagnosis of ACD, it may be challenging if not locally available. In such cases, when ACD is suspected, initiation of an avoidance protocol along with a repeated open application test (ROAT) to help confirm the culprit product(s) may provide important clues to the diagnosis.

Patient 3 deferred testing and is added to illustrate that, in a patient with a history of reactions to tomato

consumption, balsam avoidance may be of benefit, particularly if patch testing is not available. In this patient, complete resolution of her dermatitis with balsam avoidance supports the presumed diagnosis of balsam allergy.

If balsam allergy is suspected, topical balsam avoidance is the first line in management of patient's with truncal, scalp, or extremity dermatitis. Oral or perineal dermatitis may be an expression of systemic contact dermatitis from balsam-containing products applied at remote sites or ingested. If patients are only marginally better after 4 to 6 weeks of specific directed topical allergen avoidance, dietary interventions may be considered. Low-balsam diets can be difficult and arduous to follow. Furthermore, patients may benefit from avoidance of specific balsam components. For example, some patients are allergic to the vanillins, others the ferulic acids, others the coniferins or cinnamates. Some are allergic to more than one component (11). A thorough diet history can be helpful in determining which specific high-balsam-containing foods may be triggers and may simplify the avoidance regimen.

Data on the association between ACD and alopecia are lacking. Our brief case series highlights temporal, biologic, and experimental (via avoidance) relationships between ACD and alopecia in AD-primed children. Through our report, we aim to demonstrate the importance of early recognition of balsam-associated chemicals in contact allergy, early institution of avoidance, and the potential role of diet (12). Future larger prospective and retrospective studies are necessary to evaluate the strength and consistency of the association.

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