

Denouement and Discussion

Allergic Contact Dermatitis to Nickel-Containing Dental Work

Further history revealed the placement of metal dentition 2½ years earlier, correlating with the onset of skin changes.

We diagnosed the patient as having allergic contact dermatitis to nickel in her dental work. Differential diagnosis includes irritant contact dermatitis (lip-licker's dermatitis), impetigo/infection, and eczema (atopic dermatitis). A detailed exposure history and attention to clues on cutaneous examination can distinguish between these entities. There was no exudate, weeping, or crust suggesting infection, which can be excluded with bacterial/viral cultures. Earlobe involvement associated with nickel-containing earring exposure heightened suspicion of allergic contact dermatitis, as did the marked intraoral inflammation and edema. Patch testing can confirm the diagnosis of allergic contact dermatitis but is not always indicated unless lesions persist despite allergen avoidance and empirical therapy failure.

Contact dermatitis is a common inflammatory skin condition that manifests as pruritic, erythematous, well-demarcated papules or plaques on exposed areas (typically hands, face, and neck). It is further differentiated into irritant vs allergic. Irritant contact dermatitis is caused by non-immune-mediated, usually chronic irritation leading to nonspecific inflammation. For example, it commonly occurs periorally due to saliva from excessive lip licking.¹

Allergic contact dermatitis is a delayed hypersensitivity reaction (type IV) that is T-cell mediated and requires repeated exposure. A specific antigen stimulates previously sensitized CD4⁺ T cells to enable an inflammatory response including increased local vascular permeability, pruritus, pain, erythema, edema, and tissue damage.² Common causes in children include poison ivy (*Toxicodendron radicans*), nickel, neomycin, and fragrance.¹ Nickel is commonly used as a component in other metals, eg, white gold, gold plating, German silver, solder, and stainless steel. Acutely, nickel contact dermatitis commonly presents as pruritic macules and papules in the periumbilical area (from jeans snaps or metal buttons), wrists (from watches), and earlobes (from "costume" jewelry).³ Subacute to chronic allergic contact dermatitis often presents as lichenified or fissured dermatitis.¹

Oral allergic contact dermatitis may require a high index of suspicion as many people sensitive to costume jewelry can tolerate dental metals containing nickel.⁴ Oral manifestations can include cheilitis, gingivitis, stomatitis, perioral dermatitis, burning mouth syndrome, and lichenoid reaction.^{2,3} Nickel, amalgam, palladium, and gold have been implicated as allergens in dental materials, but clinical presentations can be identical.⁵ Dental crowns can be ceramic, metal-ceramic, cast-gold alloys, or base metal alloys. Cast-gold alloys are nonreactive with little potential for adverse biological response but with the disadvantage of high cost. Base metal alloys, a more economical option, are generally composed of nickel, chromium, and cobalt. In pediatric dentistry, it is common to use stainless steel crowns, composed of nickel and chromium, on primary teeth. Their use is contraindicated in patients with known nickel allergies.⁴

Treatment of allergic contact dermatitis, oral or otherwise, is centered on accurate identification of the causative allergen and patient education regarding avoidance. In cases of allergic contact dermatitis to dental work, the offending agent should be removed or replaced if possible.⁶ Localized skin lesions of the trunk and extremities can be treated with mid- or high-potency topical steroids such as triamcinolone acetate, 0.1%, or clobetasol propionate, 0.05%, ointment. Areas of thinner skin (eg, face) should be treated with lower-potency steroids such as hydrocortisone or desonide ointment. Topical calcineurin inhibitors are indicated as first-line therapy for facial dermatitis because they are not associated with ocular complications or cutaneous atrophy, as topical steroids can be.⁷ If allergic contact dermatitis is extensive (involving >20% of the body surface), oral prednisone can be considered. Again, it must be emphasized that avoiding the offending agent is required and that topical treatments are only an adjunct.

Because of its various presentations, the diagnosis of oral/perioral allergic contact dermatitis can be challenging. Paying attention to clinical clues can aid in accurate diagnosis. As associated symptoms can be quite bothersome, it is important for the general pediatrician to be able to identify allergic contact dermatitis in unusual presentations and recognize the need for appropriate treatment and/or referral. Our patient was treated with desonide ointment periorally and triamcinolone, 0.1%, ointment for the ears; she had improvement but continued to have associated dermatitis and oral changes. Crown replacement was deferred, however, on the dentist's supposition that the child would soon lose her primary teeth. Patch testing will be recommended if the eruption continues.

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REFERENCES

1. Usatine RP, Riojas M. Diagnosis and management of contact dermatitis. *Am Fam Physician*. 2010;82(3):249-255.
2. Bakula A, Lugović-Mihčić L, Situm M, Turcin J, Sinković A. Contact allergy in the mouth. *Acta Clin Croat*. 2011;50(4):553-561.
3. Silverberg NB, Licht J, Friedler S, Sethi S, Laude TA. Nickel contact hypersensitivity in children. *Pediatr Dermatol*. 2002;19(2):110-113.
4. ADA Council on Scientific Affairs. Direct and indirect restorative materials. *J Am Dent Assoc*. 2003;134(4):463-472.
5. Khamaysi Z, Bergman R, Weltfriend S. Positive patch test reactions to allergens of the dental series and the relation to the clinical presentations. *Contact Dermatitis*. 2006;55(4):216-218.
6. Kirshen C, Pratt M. Dental allergic contact dermatitis. *Dermatitis*. 2012;23(5):222-226.
7. Paller AS, Simpson EL, Eichenfield LF, Ellis CN, Mancini AJ. Treatment strategies for atopic dermatitis. *Semin Cutan Med Surg*. 2012;31(3)(suppl):S10-S17.