

Contact Allergy to Dimethacrylate

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Contact allergy to methacrylates is uncommon. We present a 55-year-old woman with a 10-year history of persistent pruritus and burning sensation of the gums every time she wore her dentures. Initially she developed swelling and erythema of the face soon after the dentures were placed on the gums. These symptoms abated after a barrier liner was applied between her gums and the dentures. However, the burning sensation and pruritus of the gums progressively worsened and she started to develop blisters on the gums. The skin allergen patch test was 3+ positive with erythema, edema, papules, ulceration, and pruritus for the denture component dimethacrylate. The diagnosis was supported by the patient's medical history, notably positive patch test, and complete amelioration of the symptoms upon cessation of dimethacrylate denture usage.

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Contact allergy to methacrylates is uncommon. We present a patient with a severe contact allergy to dimethacrylate in dentures who presented with extraoral symptoms of facial erythema and edema. This case is unique in that the contact allergen is dimethacrylate and the patient's symptoms extend beyond the site of contact.

Case Report

A 55-year-old woman presented with a history of swelling of the face and eyelids, persistent oral pruritus, and a burning sensation of the gums. These

symptoms developed when she started to wear dentures 10 years prior to presentation. The facial edema abated after a barrier liner was applied between her gums and the dentures. However, the burning sensation and pruritus of the gums progressively worsened and she noted blisters on the gums. Intermittent removal of the dentures for 1 or 2 days provided some relief; her symptoms later intensified, necessitating removal of the dentures for up to a week. In the last 10 years, she tried numerous homemade remedies and over-the-counter topical and oral agents, including a mixture of viscous lidocaine and diphenhydramine to mitigate oral symptoms. She underwent several dental manipulations to ensure the correct alignment and fit of the dentures. She had non-insulin-dependent diabetes mellitus but no history of oral candidiasis. At the time of presentation, the physical examination revealed an edentulous healthy woman. The oral cavity showed no erythema or swelling, as she had discontinued wearing dentures several weeks prior.

A standardized skin allergen patch test (thin-layer rapid use epicutaneous test [T.R.U.E. Test[®]]) consisting of 29 common allergens including a control was performed. Additionally, patch testing to specific denture components—monomer (methyl methacrylate, dimethacrylate) and polymer (methyl and butyl methacrylate)—was undertaken. The standardized patch test was negative. The denture-specific patch test was negative for polymer, but monomer (dimethacrylate) was 3+ positive with erythema, edema, papules, ulceration, and severe pruritus at 48 hours (Figure), and it remained positive for a few days. The skin-prick test for immediate hypersensitivity was negative for both agents with a positive histamine control.

Comment

Methacrylates have been used since the 1960s to manufacture dentures. Since then, there have been reports of contact allergy to methacrylates affecting dental personnel more so than patients wearing dentures.¹⁻³ The allergic reactions reported involve

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Monomer (dimethacrylate) patch test in duplicate demonstrated positive reactions (3+) with erythema, edema, papules, ulceration, and severe pruritus at 48 hours.

the oral mucosa and gums at the site of contact with the methacrylates in the dentures. The reactions commonly described have included oral pruritus, glossitis, gingival erythema, burning sensation, pain, and discomfort.^{4,7} Of the different methacrylates, dimethacrylate has been implicated the least. Given the results of the patch test (positive to dimethacrylate and negative to methyl methacrylate and polymer), it was evident that our patient developed an allergy to dimethacrylate from her dentures. Her symptoms were not only limited to the oral cavity but also extended beyond the area of contact with the dentures to cause facial erythema and edema. The immediate IgE-mediated allergy to dimethacrylate was excluded by the negative skin-prick test.

Methacrylate and dimethacrylate polymers are widely used chemicals in the plastic and rubber industry. They also are used in paper,

printing ink, cosmetic, dental, and a variety of other products. Dentures commonly are manufactured by polymerizing acrylates.⁸⁻¹⁰ Polymerized acrylates are nonsensitizing and usually are not associated with allergic reaction. If the dentures are prepared from improperly polymerized acrylates, they may contain disproportionate amounts of monomer. Prolonged contact of the monomer with the mucosa of the gums can cause sensitization or trigger allergic symptoms in a patient previously sensitized to the monomer.¹⁰ Although we were unable to ascertain, perhaps our patient was previously sensitized to dimethacrylate monomer and contact from dimethacrylate in her dentures caused the symptoms. Her dentures were well-fitting and were checked for any defects by her dentist. However, either excessive leaching of monomer dimethacrylate from dentures or presence of excessive amount of monomer in insufficiently polymerized dentures may have sensitized her and led to the allergic reaction.

Conclusion

We report the case of a woman with a contact allergy to dimethacrylate who also presented with facial erythema and edema. The diagnosis is supported by the patient's medical history and a severe positive patch test as well as complete amelioration of the symptoms upon cessation of dimethacrylate denture usage. The possibility of a contact allergy to dimethacrylate must be considered in patients who wear dentures and present with oral and facial symptoms.

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