

Connecting Allergy and Dentistry: we need to build bridges

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Dear Editor,

An article published in the March 2024 issue of the Journal of The American Dental Association, titled “Gingival hypersensitivity reactions to toothpastes”, recently caught our attention. It is worth noting that JADA is a high-impact journal, indexed in the Scopus database (CiteScore 5.0) and published by the prestigious American Dental Association. The article itself is a case series and literature review¹. It stood out to us because it showed us that it is not only our specialty of allergology—nor exclusively the medical profession—that is interested in allergic diseases. We’re forgetting the dentists!

The aforementioned article includes 11 patients from a Spanish referral center, the majority of whom were women (72.7%) with hypersensitivity to “cinnamon”. The most frequently diagnosed lesion was gingival redness with itching or mild discomfort. Toothpaste was implicated in the pathogenesis of the symptoms, as discontinuing it led to the disappearance of the lesions. Several different toothpastes were implicated. The authors contextualize that dental practitioners may encounter type I (IgE-mediated) and type IV (T-cell-mediated) hypersensitivity reactions. Delayed hypersensitivity reactions are most common, and are usually known as contact stomatitis.¹ Remarkably, in the referral-center setting at which the authors work, even with strong clinical suspicion and probable intention to publish, patch testing was only performed in approximately half of the cases, and in many cases with toothpaste alone. The most pertinent question is: how would we react to cases like these in Brazil?

It is acknowledged that hypersensitivity reactions to dentifrices are unusual. This is because toothpaste is continuously diluted in water and saliva during tooth-brushing.¹ However, it is important to note that toothpaste formulations are quite complex, containing multiple ingredients. These include mild abrasives, fluorides, humectants, flavorings, artificial sweeteners, thickening agents, dyes, and surfactants.² These formulations also vary widely depending on the manufacturer. Therefore, when involvement is suspec-

ted, testing with the patient’s toothpaste is essential. This maxim applies to the management of contact dermatitides in general: testing must be performed with the patient’s own product! However, allergists know that testing with undiluted toothpaste alone can cause false-positive reactions. Renowned expert Anton de Groot advises that a semi-open or occlusive test be carried out initially with undiluted toothpaste. However, as noted above, if this test is positive, it does not conclusively demonstrate an allergy. The toothpaste should be additionally tested in serial dilutions (100%, 50%, and 20%, diluted in petroleum jelly or water) and/or tested in controls. Challenge and rechallenge may also be useful to demonstrate whether a positive test is clinically significant.² The allergist is the professional who is most qualified for (and familiar with) performing such dilutions for patch testing procedures.

However, patient counseling can only be considered complete when each ingredient is tested on its own in an attempt to identify the offending chemical trigger.² The Spanish study cited the article that endorsed the launch of the standard Latin American series adapted for patch testing in Brazil.³ This series unquestionably represented a major step forward in updating our old Brazilian standard battery. As an example of the importance of this adaptation, a recent study identified the substances most often associated with sensitization in patients with oral diseases. Sodium tetrachloropalladate was the most commonly implicated substance, with a remarkable positivity rate of over 27% among tested patients. For comparison purposes, nickel sulfate came second with 23% positivity.⁴ This chloropalladate salt, which represents the element palladium, is also in the Latin American series. The adapted series also includes propolis, a leading cause of allergic cheilitis. The North American Contact Dermatitis Group (NACDGD) lists propolis as one of the most prevalent such substances, with an 8.6% positivity rate.⁵ There is also growing concern regarding propolis in Europe, and it has already been incorporated into the European baseline series.⁶ Reports of perioral lesions caused by propolis first emerged in Brazil with the advent of the Latin American series.⁷ We believe there were no previous reports of such a diagnosis because this substance is not regularly tested in our country. Allergists need to show dentists that we are used to performing patch tests with this series, which can mean elucidating the specific etiologic agent implicated in a case of oral pathology.

In addition, we currently have very good supplemental patch test series available for use in situations such as this. The dental series, which is made to order by an established manufacturer of extracts for patch testing, is very similar to an equivalent series available in Europe,⁸

which shows we are no longer limited to standard batteries alone (Table 1). An analysis of this series shows that acrylates and certain metals commonly used in dentistry predominate. These substances greatly broaden diagnostic possibilities for dentists who treat patients with hypersensitivity reactions.

A review of the current specialized literature shows many cases that demonstrate the importance of supple-

mental specialist series. For instance, one published case reports an 8-year-old child who presented with a 1-year history of cheilitis. Topical treatments were tried but improvement was only seen during use; when discontinued, the lesions recurred. The patient denied using lipstick and the like. His condition caused anxiety in the family. Intraoral examination revealed 4 metal crowns. Laboratory tests were within normal limits. A patch test was then performed,

Table 1

Patch test battery, dental series^a

Série dental	Concentração	Veículo
1. Methyl methacrylate	2%	Petroleum jelly
2. Triethylene glycol dimethacrylate	2%	Petroleum jelly
3. Diurethane dimethacrylate	2%	Petroleum jelly
4. Ethylene glycol dimethacrylate	2%	Petroleum jelly
5. Bisphenol A diglycidyl dimethacrylate	2%	Petroleum jelly
6. <i>N,N</i> -Dimethyl- <i>p</i> -toluidine	5%	Petroleum jelly
7. Benzophenone 3 (Oxybenzone)	10%	Petroleum jelly
8. 1,4-Butanediol dimethacrylate	2%	Petroleum jelly
9. Bisphenol A dimethacrylate	2%	Petroleum jelly
10. Potassium bichromate	0.5%	Petroleum jelly
11. Cobalt chloride	1%	Petroleum jelly
12. 2-Hydroxyethyl methacrylate (2-HEMA)	2%	Petroleum jelly
13. Nickel sulphate	5%	Petroleum jelly
14. Eugenol	2%	Petroleum jelly
15. Colophon	20%	Petroleum jelly
16. Formaldehyde	2%	Water
17. <i>p</i> -Tolyldiethanolamide	2%	Petroleum jelly
18. Copper sulfate	2%	Petroleum jelly
19. Methyl hydroquinone	1%	Petroleum jelly
20. Palladium chloride	2%	Petroleum jelly
21. Aluminum chloride	2%	Petroleum jelly
22. Camphorquinone (bornanedione)	1%	Petroleum jelly
23. (Dimethylamino)ethyl methacrylate	0.2%	Petroleum jelly
24. 1,6-Hexanediol diacrylate	0.1%	Petroleum jelly
25. Drometrizole (2(2'-hydroxy 5'-methylphenyl) benzotriazole)	1%	Petroleum jelly
26. Tetrahydrofurfuryl methacrylate	2%	Petroleum jelly
27. Tin	50%	Petroleum jelly
28. Sodium tetrachloropalladate	3%	Petroleum jelly
29. Carvone	5%	Petroleum jelly
30. Glutaraldehyde	0.2%	Petroleum jelly

^a IPI ASAC BRASIL® patch test battery: dental series.

which was consistent with nickel sensitivity. The patient denied any contact with metal instruments. Therefore, the decision was made to replace the alloy crowns with composite resin ones; within 2 weeks, there was complete remission of the patient's condition.⁹

Cases of sensitivity to acrylates are even more common. One published example is a 41-year-old Japanese woman who used a gingival protection product during teeth whitening. A second treatment session occurred a week later. The next day, the patient developed gingival ulcerations with purpura and lip edema. A clinical diagnosis of contact dermatitis was made and she underwent patch testing, which was positive for two acrylates and three methacrylates. The gingival protection agent contained 2-hydroxyethyl methacrylate. The absence of symptoms during the initial treatment, followed by a severe reaction after the second application, suggests that the patient was sensitized during her first contact with the product. Cross-reactivity between methacrylates is to be expected.¹⁰

The oral cavity should be carefully studied by a physician or dentist whenever any type of lesion is discovered on the oral mucosa or tongue. The lips and perioral region should not be overlooked. This investigation should include a detailed history and immunoallergic workup. When properly indicated, patch testing should be performed with a standard series followed by a dental series as well as the patient's own products.

We must strengthen our ties with the dental profession. We need dentists to be both familiar with our specialty and aware that we are able to help them address these symptoms when they present. Indeed, we know that dentists are often the first to notice such conditions in their patients. Allergists, in turn, need our Society to act by making this connection—for instance, by promoting lectures for dentists across the states of Brazil, demonstrating our expertise and the excellent work we already do and are in the constant pursuit of improving.

It's time to build bridges...

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