

Allergic contact stomatitis from bisphenol-a-glycidyl dimethacrylate during application of composite restorations: A case report

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Abstract

Composite resins have revolutionized the field of esthetic dentistry. They are safe to use and usually do not cause any untoward reactions. Allergies to composites are rare, but they do occasionally occur as patients are briefly exposed to the resin before it is polymerized and becomes non-allergenic. Here, we present a case of allergic contact stomatitis due to *bis*-GMA.

Keywords: Allergic contact stomatitis, *bis*-GMA, composite

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Composite resins have made possible the direct bonding of restorative resin to stained, malposed, fractured, or otherwise damaged teeth requiring esthetic and functional improvement. The development of dental polymers and the technology for their use were the principal factors that ushered in the era of esthetic dentistry and improved and expedited the delivery of dental care. *bis*-GMA, or 2,2-bis-[4(2-hydroxy-3-methacryloxypropoxy)phenyl]-propane, is an aromatic methacrylate developed by Rafeal Bowen of the National Bureau of Standards in the early 1960s. Although it is widely used, reports of allergic reactions to *bis*-GMA are rare. In a study of Goon et al. ^[1] only two of 1322 dental patients showed positive patch test reactions to *bis*-GMA.

Case report



A female patient aged 23 years reported to the Department of Conservative Dentistry, Government Dental College, Kozhikode, Kerala, with fractured upper central incisors [\[Figure 1\]](#). There was no history of any systemic illnesses or medication. The patient had a posterior composite restoration in

her lower right first molar. A composite restoration in the upper central incisors was given [\[Figure 2\]](#). She reported to the dental clinic 2 days later with the complaint of a burning sensation and swelling in her upper and lower lips. Clinical examination revealed erythema over the upper and lower lips in close relationship with the restorations. There was fissuring and peeling of the mucosa, besides bleeding spots [\[Figure 3\]](#) and [\[Figure 4\]](#)



Figure 1: Pretreatment view showing fractured maxillary central incisors



Figure 2: Post-treatment view after restoration with composite



Figure 3: Mucosal erythema and fissuring, with bleeding spots



Figure 4: Mucosal erythema and fissuring

Diagnosis

The first step for the recognition of allergy-induced diseases is to obtain a detailed history and carefully examine the clinical course. Hypersensitivity reactions that are cell mediated, such as contact dermatitis, can be confirmed by patch testing. ^[2] The method involves the epicutaneous application of a specific allergen at a defined concentration and in a defined vehicle; this will induce a cutaneous inflammatory reaction in a sensitized person but will cause no reaction in a non-sensitized person. In our patient, patch testing was performed with the dental screening series (Malmö, Sweden). Patches were applied to the upper back and occluded for 2 days using the occlusive Finn Chamber (Malmo, Finland) and read on day 3. She showed positive reaction (strongly positive) to bis-GMA 2% pet (2% in petrolatum). Thus, allergic reaction to the restoration was confirmed and the composite restoration was replaced by ceramic crowns.

Discussion

Methacrylic compounds are nowadays widely used in restorative dentistry, and composite resin restorations have almost completely replaced amalgam fillings. Sensitivity to bis-GMA is a rare cause of allergic contact stomatitis in dental patients. When allergy occurs it is because the patient is briefly exposed to the resin before it is polymerized and becomes non-allergenic. ^[3] Also, it should be noted that the intraoral polymerization is not 100%, and the unpolymerized residual monomer may leach out to sensitize the surrounding oral mucosa. ^[4] Lønnroth et al. ^[5] have shown that the liquid component in resin products has a strong irritation capacity.

Allergic reactions depend on an individual's genetic disposition and previous exposure to the allergen (sensitization). Materials-related reactions could be cell-mediated delayed reactions (type IV) or immediate reactions with humoral antibodies (types I-III). The delayed reactions are characterized by different forms of allergic contact dermatitis or mucositis, in which T-lymphocytes, custom made for the particular allergen, act in concert with other lymphocytes and mononuclear phagocytes to cause swelling, induration, or eczema. The latter form of delayed hypersensitivity is especially important in relation to biomaterials. In a study based on the Swedish National Board of Health and Welfare's register of side-effects from dental materials, it was reported that patients and dental practitioners reacted to different dental materials. ^[6] A conceivable explanation for this is that the exposure is different between the groups. Dental practitioners handle the materials when they are in their most reactive form, whereas patients are generally exposed to set materials. A large number of acrylic monomers are used in dental practice. Multiple sensitivities to various acrylates, particularly methacrylates, are often demonstrated and the cross-reaction patterns can be unpredictable. In addition, producers of acrylates are not legally obliged to list the individual components on the labels, thus adding to the difficulty in correct identification of allergens. For all of these reasons, it is important to patch test patients with samples of their own acrylates and composite resins, as well as those in the various dental impression trays. The patch test concentration ideally should not exceed 1% for composite resins. If higher concentrations are used, there is a risk of sensitization or leukoderma.

Conclusion



The use of acrylics, resins, and polymer materials in restorative dentistry represent a major advance in dentistry. These products may act as allergens in some individuals. One should keep in mind that every technology, no matter how beneficial, can have a negative impact on some members of the population. Public health policy will always involve balancing maximum benefit and minimum harm to public health and well-being.

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