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Severe stomatitis with a deep buccal ulcer associated with an allergic reaction to methyl methacrylate used for dental treatment

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Although allergic contact dermatitis caused by liquid acrylic monomer is common in dental professionals (1), oral mucosal disorders resulting from delayed-type allergy to methyl methacrylate (MMA) in dental patients are rare (2–4). Here, we report an unusual case of deep buccal ulcer caused by contact allergy to MMA monomer in acrylic resin.

Case Report

A 54-year-old woman was referred by a local dentist to our dermatology clinic for evaluation of severe stomatitis and a painful ulcer. Physical examination showed erosions of the upper palate and bilateral buccal mucosa. A deep ulceration with erythema in the right buccal mucosa was also noted (Fig. 1). The patient was otherwise healthy and free from systemic symptoms indicating Behçet disease or Crohn's disease. Nine days earlier she underwent dental treatment with 'acrylic resin A' as a temporary filling for a right maxillary molar tooth. On her way home, she felt a stinging sensation in the oral cavity, and found that the right labial angle was eroded. On day 4, the dentist covered the 'acrylic resin A' with 'acrylic resin B'. On day 5, the mucosal epithelium of the entire palate detached, and subsequently the patient experienced severe pain when swallowing. Therefore, all of the sealing products were removed, and 'acrylic resin C' was used as a temporary dental crown. However, the pain worsened, and on day 6 the 'acrylic resin C' was removed.



Fig. 1. A deep ulceration is seen at the right buccal mucosa, and there are erosions bilaterally and in the upper palate caused by contact allergy to methyl methacrylate used in dental treatment.

Table 1. Results of patch testing

Material	Percentage/vehicle	D2	D3	D7
Liquid material of acrylic resin A*	2% pet.	++	+	+
	1% pet.	++	+	+
	0.1% pet.	–	?+	?+
Liquid material of acrylic resin B*	2% pet.	++	+	+
	1% pet.	++	+	+
	0.1% pet.	–	–	–
Methyl methacrylate	2% pet.	+	+	+
Liquid material of acrylic resin C*	2% pet.	++	++	+
	1% pet.	++	+	+
	0.1% pet.	+	?+	?+
The mixture of liquid and powder of acrylic resin C	'as is'	+	+	+

* All three liquids of dental materials contain methyl methacrylate.

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Finally, the patient was referred to our dermatology clinic on day 9. Treatment with oral betamethasone (2 mg) was started, and the symptoms resolved within 3 weeks. The acrylic resins used were prepared by mixing liquid material, which contains MMA monomer, and powder materials, which include polymethyl methacrylate or polyethyl methacrylate, used without ultraviolet curing. Closed patch testing with the above dental materials was carried out with Finn Chambers® on Scanpor® tape (SmartPractice, Phoenix, AZ, USA), according to ESCD criteria (5). Positive reactions to the liquid of all three acrylic resins were noted on day (D) 2, D3, and D7, while a negative result with the powder of the three acrylic resins (2% pet.) was observed. Furthermore, the patient had a positive reaction to the mixture of liquid and powder of 'acrylic resin C' ('as is'). Ingredient patch testing with the liquid of 'acrylic resin B' on D2, D3 and D7 gave positive results for MMA (Table 1). As MMA was present in all three liquid materials, we diagnosed the condition as delayed-type allergy to MMA.

Discussion

Acrylic resin is polymerized by mixing the liquid MMA monomer and the powdered material of polymethyl methacrylate (or another methacrylic ester polymer) (1). As MMA is a powerful sensitizer, hand eczema among dental professionals is common. However, because polymerized acrylic resin is not sensitizing, dental patients do not usually develop allergy to MMA. A limited number of reports exist regarding delayed-type allergic reactions to residual MMA monomer in denture or dental prostheses (2–4). Notably, one case was associated with a buccal ulcer and an anaphylactic reaction to MMA monomer (4). Therefore, a buccal ulcer may be a sign of severe allergy. In the present case, the acrylic resins were used as temporary fillings and a crown, which released more MMA monomer than dentures made of acrylic resin, owing to the polymerization within the mouth.

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