

with RSD for recoveries in accuracy. A deeper analysis of the results pointed to Triton X-100 as a better particle-bound protein solubilizer than SDS, because, although the recovery of standard BSA added was good for both, the values of protein content obtained in samples were quite lower when SDS was used. For investigation of whether the higher protein values obtained with method 3 were due to some interference not detected when accuracy was evaluated, the protocol was modified in the inverse direction; that is, by adding increasing quantities of sample to a fixed amount of standard (50 µl of diluted stock standard of BSA). In this case, no bias was found, the intercept just corresponding to the 50 µl BSA standard.

Five different samples of commercial high-ammoniated latex were finally analyzed for proteins by method 3, giving the following results: 9.0, 10.3, 10.6, 11.3, and 10.1 mg protein/g sample, respectively.

In view of these results, we concluded that method 3 is very suitable and convenient for routine analysis of protein in natural rubber latex, since it requires only centrifugation and commonly available, inexpensive reagents.

Key words: bichinchoninic acid; natural latex; protein measurement.

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Accepted for publication 19 February 1998

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ALLERGY 1998;53:720-722

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Denture-induced local and systemic reactions to acrylate

DENTURE stomatitis is a well-known problem in denture wearers. In the overwhelming majority of cases, clinical symptoms are caused by irritation from ill-fitting dentures, combined with insufficient hygiene regimen and/or fungal infec-

tion. Allergic contact stomatitis is rare (1-2). Of 291 patients in the hospitals of the IVDK (Information Network of Departments of Dermatology) patch-tested in 1994 because of denture-associated problems, only 5.5% ($n=16$) were diagnosed as having allergic contact stomatitis (3). Only a few case reports about denture material-induced contact stomatitis due to acrylates have been published (2, 4-6). We report the first case, to the best of our knowledge, of combined contact stomatitis and systemic reaction due to acrylate sensitization.

A 56-year-old retired medical assistant developed painful burning sensations in the oral cavity after having a methyl methacrylate-base partial denture prosthesis fitted in the lower and upper jaws. Clinical examination showed erythema and ulcerations of the gingival mucosa at the site where the prosthesis had been inserted. No clinical evidence of candidiasis, oral lichen planus, or squamous cell carcinoma was found. In-depth examination by a dentist excluded an ill-fitting prosthesis. Swabs taken from the oral mucosa and the prosthesis were negative for candidiasis or bacterial infection. Patch tests were performed with the standard series, denture material series, and metal series recommended by the German Contact Dermatitis Research Group. The patient showed positive patch test reactions after 96 h to methyl methacrylate monomer 2% pet. and 2-hydroxypropylacrylate 0.1% pet. No reactions were shown to polymerized methyl methacrylate-containing denture materials (Table 1). No sensitization was shown to allergens of the standard or metal series. Latex sensitization could be excluded.

For confirmation of the diagnosis, the prosthesis was removed, and topical treatment with corticosteroids was performed, resulting in complete healing. Re-exposure to the prosthesis was followed by relapse of the mucosal inflammation and even development of edema of the tongue, lips, eyelids,

Table 1. Patch test results of relevant allergens

Allergens	(pet.)	D1	D2	D3	D4
Methyl methacrylate	2%	-	-	?x	+
2-Hydroxypropylacrylate	0.1%	-	-	?x	+
Luxene*	As is	-	-	-	-
Polyan*	As is	-	-	-	-

Patch tests were performed with denture material series, standard series (not shown) and metal series (not shown) recommended by German Contact Dermatitis Research Group. Reading was performed after 24 h (D1), 48 h (D2), 72 h (D3), and 96 h (D4); ?x: erythematous, not infiltrated test reaction, considered questionable; +: erythematous, infiltrated patch test reaction with some papules; -: negative patch test reaction.

*Polymerized denture materials with low content of acrylate resins (<1% monomeric acrylate resins when polymerized) were cut into small pieces and tested in Finn Chambers on Scanpore.

and hands. The development of dyspnea required systemic steroids. No dermatitis was observed during the whole course. A vinyl-based denture with low methyl methacrylate content, which is normally well tolerated in such a case, also led to a relapse. Indeed, the patient developed the full range of symptoms mentioned above. Eventually, a methyl methacrylate-free polycarbonate prosthesis was well tolerated.

Contact stomatitis due to acrylic resins in denture materials is uncommon. Erythematous reaction on remote body sites has not been reported before. Our patient had had an occupational exposure to acrylic resins years before when sensitization may have occurred. The re-exposure to the chemicals through wearing the prosthesis caused a severe and eventually life-threatening allergic reaction.

Denture stomatitis may be of irritative, infectious, or allergic nature (1, 2, 4–6). Mechanical irritation from an ill-fitting denture is considered to be the most common factor. Candidiasis and mixed microflora in combination with insufficient hygiene regimens are regarded as important cofactors in denture-induced stomatitis (1).

Acrylic monomer content in cured denture material should be of <1%; usually it does not cause toxic or allergic symptoms, even in sensitized patients. That explains why only a few cases of clinically relevant contact sensitization to acrylic resins have been reported (2, 4–7). Nevertheless, highly sensitized subjects such as our patient might develop allergic contact stomatitis in response to the acrylic resins in denture materials, even when patch tests with polymerized denture materials are

negative. For confirmation of allergic contact stomatitis, patch testing with monomeric acrylic resins and exposure to the prosthesis may provide diagnostic clues.

A particular feature of our case was the anaphylactic reaction at remote sites of the body. We assume that the patient developed sensitization to acrylic resins while employed as a medical assistant years before. This sensitization may have been responsible for the strong clinical response to acrylic monomers.

Key words: dental prosthesis; 2-hydroxypropylacrylate; IgE allergy; methyl methacrylate; type IV sensitization.

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Accepted for publication 19 February 1998

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ALLERGY 1998;53:722–723

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