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Allergic perioral contact dermatitis caused by rubber chemicals during dental treatment

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Although allergic skin reactions to latex proteins have often been reported in patients treated by dentists wearing rubber gloves (1, 2), the so-called rubber accelerators (vulcanizers) are very rarely identified as culprit allergens (3). Here, we present 2 dental patients with perioral allergic contact dermatitis caused by rubber chemicals from protective rubber gloves used by dentists.

Case Report

Case 1

A 68-year-old non-atopic woman was referred with recurrent perioral and lip dermatitis and oedema of the oral mucosa following dental treatments. Prior to retirement, she had been working as an auxiliary nurse for 31 years. Throughout a normal workday, she had been using protective rubber gloves for more than 2 hrs in total, and > 20 pairs of protective gloves. At the time, she experienced fluctuating hand eczema with erythema and vesicles on the dorsal aspects of the hands, with improvements over the weekends and during time off. She stopped using latex gloves, and instead used nitrile gloves, as she suspected that the hand eczema was a result of latex allergy. After this change to nitrile gloves and shorter periods of therapy with topical corticosteroids, the dermatitis cleared completely within 1 year.

No flare-up episodes were observed during the following 8 years.

However, sudden onset of erythema and oedema around the mouth and lips occurred on two separate occasions following dental procedures lasting for ~ 30 min. In both cases, 25 mg of prednisolone daily cleared the skin lesions in ~ 5 days, with residual mildly scaly skin. We performed patch testing with the European baseline series, the extended European baseline series, and the more specialized series with fragrances and rubber chemical accelerators. Finn Chambers® (8 mm; Smartpractice, Phoenix, AZ, USA) on Scanpor® tape (Norgesplaster A/S, Alfarma, Vennesla, Norway) were used. The patch tests were applied to the upper back and occluded for 48 hrs. Readings were performed on day (D)2, D3, and D7, according to ICDRG recommendations (4). The patch tests showed positive patch test reactions to fragrance mix 1 (2+), fragrance mix 2 (2+), thiuram mix (2+), tetramethylthiuram monosulfide (2+), tetramethylthiuram disulfide (2+), tetraethylthiuram disulfide (2+), dipentamethylene thiuram disulfide (2+), zinc diethyldithiocarbamate (1+), and potassium dichromate (2+). Doubtful reactions to dimethyldithiocarbamate (+?) and farnesol (+?) were also observed. A prick test with natural rubber latex proteins gave a negative result.

The history also revealed that, prior to retirement, the patient underwent hip replacement surgery, and the cobalt chromium hip prosthesis was considered to be the most likely cause of chromium allergy. However, she never experienced dermatitis caused by leather products nor by dental alloys. The fragrance allergy was probably of former clinical relevance, as the patient reported episodes of axillary dermatitis. She was thus diagnosed with contact allergy to rubber accelerators induced by the extensive use of protective gloves as an auxiliary nurse, and, importantly, with elicitation caused by subsequent

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exposure to dental protective gloves that contained rubber accelerators.

Case 2

A 54-year-old non-atopic man presented with chronic hand eczema with fissures and vesicles localized at the dorsal and interdigital aspects of both hands. Working as a technician at a dry-cleaning salon, he used approximately 10–12 pairs of protective gloves per day, and was also in close and prolonged contact with the rubber parts of floor-cleaning machines up to three times daily. At this workplace, he had no skin contact with cutting fluids, but he had previously been working as a mechanic with close skin contact with cutting oils, without any skin lesions. He had episodically experienced axillary pruritus in relation to the use of some deodorants. Moreover, he had previously experienced the sudden onset of erythema and oedema of the lips and perioral area following dental treatments of > 20 min. The flare-up symptoms with perioral dermatitis gradually resolved within 2 weeks after the initial dental procedure, without the patient having consulted his dentist, general practitioner, or dermatologist. After the following dental visit, he again experienced symptoms of perioral dermatitis.

The patient was patch tested in the same way as the first patient, and additionally with physiologic saline extracts made of four rubber draught excluders from the floor-cleaning machines. The patch tests showed positive patch test reactions to clioquinol (2+), fragrance mix I (+), thiuram mix (2+), diethylthiourea (2+), tetramethylthiuram monosulfide (2+), tetramethylthiuram disulfide (2+), tetraethylthiuram disulfide (2+), dipentamethylene thiuram disulfide (2+), zinc diethyldithiocarbamate (2+), and zinc dimethyldithiocarbamate (+). Doubtful reactions to methyltribromoglutaronitrile, zinc dibutyldithiocarbamate and morpholinyl mercaptobenzothiazole were observed. The additional patch testing with the rubber draught excluders provided by the patient showed a positive patch test reaction to a beige rubber draught excluder (2+), and two

doubtful reactions to a red and brown rubber draught excluder. A prick test with natural rubber latex proteins gave a negative result.

The patient was therefore diagnosed with allergic contact dermatitis probably caused by thiurams and carbamates as primary sensitizers in the rubber draught excluders used for the floor-cleaning machines, followed by perioral dermatitis caused by the close skin contact with the dentist's powdered rubber latex gloves, which contained and released rubber accelerators. Meanwhile, the dentist started to use synthetic nitrile rubber gloves without rubber accelerators. After this change, the patient did not experience any flare-up episodes in relation to his dental visits.

Discussion

The two cases show that patients who are sensitized to rubber accelerators including thiurams may experience episodes of allergic contact dermatitis around the mouth when exposed to protective gloves used by dentists. This finding is very unusual indeed, and allergic perioral dermatitis caused by rubber accelerators following dental treatments has, to our knowledge, only been described very rarely (1, 2).

As a result of the increasing prevalence of thiuram contact allergy during the 1990s and early this century, glove manufacturers have allegedly attempted to reduce the use of rubber accelerators in the vulcanization process for rubber gloves (5, 6). However, sensitization to thiurams and carbamates remains common in patients with occupational skin disease (5). Our two cases are in line with a previous study reporting that even airborne exposure to thiurams is able to induce allergic contact dermatitis, suggesting that thiuram contact allergy by proxy is a hitherto overlooked problem (7). To avoid accidental perioral allergic dermatitis in relation to, for example, dental visits, dermatologists should inform their patients with contact allergy to rubber accelerators to avoid contact with rubber accelerators in protective gloves worn by medical personnel treating them.

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