

Contact urticaria/angioedema caused by nickel from metal dental braces

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Case report

A 26-year-old male was referred to our Contact Eczema Department with recurrent angioedema for 10 months. Hereditary angioedema was ruled out by the Allergy department (completely normal complement study). Treatment with oral antihistamines (cetirizine 20 mg/day) showed no improvement. The patient only improved on oral corticosteroids, but with almost immediate recurrence 3-5 days after withdrawal of treatment. Granulomatous cheilitis was ruled out with two biopsies performed in the last three months. Personal history of triggers revealed that the patient had been wearing dental braces for 12 months. The patient reported having had piercing of the tongue years ago, but not currently. On physical examination, recurrent angioedema of the upper (Fig. 1A-B) and lower lip (Fig. 1C) was observed. An episode of hives was reported by the patient (Fig. 1D). No intraoral injuries were observed. Blood nickel levels were normal (1.2 µg/L). The patient's dental brace was composed of nickel according to the information offered by the orthodontist. Patch tests were performed with the European Comprehensive Baseline Series (Chemotechnique Diagnostics, Vellinge, Sweden) and metal series (Chemotechnique Diagnostics). The results were interpreted according to the criteria of the International Contact Dermatitis Research Group. Patch tests were read on day (D) 2 and D4. The patient showed a nickel positive patch test reaction (++++) (Fig. 2A). Prick test with nickel sulphate 5% pet was positive (>5 mm) at the reading at 20 minutes (Fig. 2B) and with a negative control.

Contact urticaria/angioedema caused by nickel was diagnosed. Dental braces were exchanged for ceramic material. Dimethylglyoxime test was positive in patient's metal bracket. Complete improvement without treatment was observed in 7 days, and no recurrence was observed at 3 and 6 months of patient follow-up.

Discussion

Nickel allergy is common, and it is considered the most frequent contact allergen in the world. It is a ubiquitous allergen, present in metallic materials, cosmetics, and even food. Persons with piercings, mainly women, constitute a special group at risk of developing sensitization to nickel. Nickel sensitization from exposure to orthodontic treatments has been studied. Kalimo et al¹ examined and patch tested 153 students, and they observed that nickel sensitized students may have acquired the allergy by dental braces exposure. Saliva could play an important role in this phenomenon. It may potentially corrode the dental braces (brackets, bands, mesh, pads, and arches), with the consequent release of

nickel in the intraoral cavity. The oral mucosa, due to the rich vascularization and non-keratinized epithelium, could be considered a special area to allow a greater absorption of allergens. The level of nickel in saliva and serum increases significantly after the insertion of orthodontic appliances². Nickel-free alternative brackets to stainless steel include ceramic, polycarbonate, gold and titanium components³. It is important to assure the diagnosis, as the cost can increase up to 30% with nickel-free brackets.

Clinically, angioedema and urticaria, without the clinical presence of eczema, orient us more towards type I hypersensitivity as stated by Saluja et al⁴, who presented 11 cases prick test positive to nickel, whereof 6 had stories consistent with contact urticaria to various jewellery/earrings. Some reports have shown evidence of concurrent type 1 and type 4 hypersensitivities to nickel⁵, as might be suspected in our patient. In conclusion, we present a case of contact urticaria/angioedema caused by nickel from metal dental brackets. The performance of several complementary tests, and the visit to different specialists may be observed in these patients. It is an infrequent clinical presentation of nickel allergy, which requires suspicion to achieve at a correct diagnosis.

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Figures

Figure 1. (A) Edema affecting half of the upper lip. **(B)** Complete upper lip edema. **(C)** Edema affecting the lower lip. **(D)** Several hives on forearm.

Figure 2. (A) Patch test positive to nickel 5% pet. (D4). **(B)** Positive nickel 5% pet. prick test reading at 20 minutes. Negative control showed no reaction.



287x190mm (96 x 96 DPI)



250x190mm (96 x 96 DPI)