

## CASE REPORT

### Dental Allergic Contact Dermatitis: A case report

Eman Al-Haqan, MD, Abdulhamid El-Gamal, MD, Randhir S Kadyan, MD

*Department of Dermatology, Al-Adan Hospital, Kuwait*

#### INTRODUCTION

Acrylates are plastic materials that are formed by polymerization of monomers derived from acrylic or methacrylic acid.<sup>1</sup> Acrylic acid was synthesized in 1843, while methacrylic acid was produced in 1865. Meanwhile, acrylic acid esters were polymerized for the first time by Fittig and Paul in 1877.<sup>2</sup> Acrylates have found numerous applications in paints, varnishes, adhesives, in printing industries, in medical and dental professions, and in artificial nails.<sup>1</sup>

The use of acrylates has expanded enormously and has resulted in a vast range of products for both occupational and non-occupational purposes. This is reflected in increased in dermatological problems, particularly allergic contact dermatitis related to their usage.

#### CASE REPORT

We present a female patient, 24 year old with 3 months history of swelling of her lips, gums associated with vesiculation and erythema on her cheeks (Fig. 1, 2). She had experienced one previous similar attack, when she was exposed to dental material for fixing temporary crown for the first time two weeks before. The patient did not suffer from any medical diseases, there was no



**Fig. 1**



**Fig. 2**

history of childhood eczema, asthma or hay fever. She had no history of previous allergy to neither a specific type of food nor to specific medication. The patient was not on any regular medication. Family history showed her brother had atopic der-

---

*Correspondence: Dr. Eman Al-Haqan, Department of Dermatology, Al-Adan Hospital, Kuwait*

matitis. The patient worked as a banker with no history of exposure to irritants in her work place. Her baseline laboratory investigations were normal. Patch Test was done using the European Baseline Series, along with the Dental Series (both Chemotechnique diagnostics). The patches were held in place for 48 hours. Readings were done according to databases previously described by Pratt et al.<sup>3</sup> The patient was found sensitive to the following allergens:

- Ethyleneglycol dimethacrylates
- Hydroxyethyl methacrylates
- Gold Sodium thiosulfate
- Tetrahydrofurfuryl methacrylates

The final reading after 7 days revealed a (2+) reaction to the previously mentioned allergens. (Fig. 3, 4).



Fig. 3



Fig. 4

## DISCUSSION

There are varying case reports in the literature attributing reactions in the mouth due to allergic contact dermatitis to acrylates.<sup>4,5</sup> Acrylate-allergic patients often display multiple positive tests.<sup>1</sup> Acrylic, that is fully polymerized is usually non-sensitizing, but the acrylic monomers are capable of sensitization. Polymerization occurs either by chemical reaction at room temperature, heat curing, or by light curing with blue or visible light.<sup>6</sup> Risk of active sensitization and cross-reactions are common. Non-occupational exposure to acrylic compounds in dental patients has led to active sensitization. Dental composite resins are composed of an epoxy group polymerized with acrylic monomers with the help of a catalyst. All of these compounds could be responsible for allergic contact dermatitis. Studies revealed that 2-hydroxyethylmethacrylate are released from resins found in saliva immediately after placement on teeth and are present afterward in pulp.<sup>7</sup>

As we found in our case, Lazarov<sup>8</sup> presented another series showing 2-hydroxyethylmethacrylates, 2-hydroxypropylmethacrylate and methacrylate are producing the most positive reactions. Another allergic contact stomatitis and perioral dermatitis from several epoxy dimethylacrylates in dental composite resin was described by Kanerva and Alanko.<sup>9</sup>

As for our patient, we recommended to remove her dental work. In the meantime, She has treated systematically with oral Prednisolone and topical corticosteroids along with systemic antibiotic to prevent secondary infections.

## CONCLUSION

Acrylates & Methacrylates have a wide range of daily applications. They are irritant and also

strong allergens. In any patient with dental complaints, we should always consider the possibility of allergic contact dermatitis. It is necessary to do our best to unmask all the materials used in dental work. If a positive reaction is found and is relevant, appropriate replacement of the offending agent should be recommended.

## REFERENCES

1. Sasseville D. Acrylates in Contact Dermatitis. *Dermatitis* 2012; 23 (1):6-16.
2. Decker FA Jr. A survey of methacrylic acid and its derivatives as synthetic resins. Putnam, CT: Patriot Press, Inc; 1940:9.
3. Pratt MD, Belsito DV, Deleo VA, et al. North American Contact Dermatitis group patch test results 2001-2002 study period. *Dermatitis* 2004; 15:176-83.
4. Kanzki T, Kabasawa Y, Jino T, et al. Contact Stomatitis due to methylmethacrylate monomer. *Contact Dermatitis* 1989; 20:146-48.
5. Koutis D, Freeman S. Allergic Contact Stomatitis caused by acrylic monomer in a denture. *Austral T Dermatitis* 2001; 42:203-206.
6. Austin AT, Basker RM. Residual monomer levels in denture bases: the effect of varying short curing cycles. *Br Dent J* 1982; 153:424-26.
7. Hume WR, Ceerzian TM. Bioavailability of components of resin-based materials which are applied to teeth. *Crit Revol Biol Med* 1996; 7:172-79.
8. Lazarov A. Sensitization to acrylates is a common reaction to artificial finger nails. *J Eur Acad Dermatol venereol* 2007; 21:169-74.
9. Kanerva L, Alanko K. Stomatitis and perioral dermatitis caused by epoxy diacrylates in dental composite resins. *J Am Acad Dermatol* 1998; 38:116-20.
10. Riva F, Pigatto PD, Altomare GF, et al. Sensitization to dental acrylic compounds. *Contact Dermatitis* 1984; 10 (4):245.