
Introduction

There are too many different dental alloys at the dental market, and a multitude of dental restorative procedures are based on the use of these cast alloys. However, during recent years, case reports have been published indicating that oral tissue reactions may occur in contact with dental cast alloys. Reports of the prevalence of adverse effects to all dental materials used in daily practice, based on literature surveys, show that the frequency was estimated to be generally low. Kallus and Mjör, found 46 cases of allergic sensitivity to dental materials out of 13,325 patients. Hensten and Pettersen, also found that the incidence of adverse effects was estimated to be 1:400 in prosthodontic patients. Garhammer et al., found that 250 patients, who attributed symptoms to dental alloys, represent about 0.03% of population of the region of Eastern Bavaria. Also they found that 17 patients out of 250 persons showed positive allergic reactions to metal salts in the back-skin patch test.

Overwhelming evidence from many case reports (results from skin tests) have shown that allergy may be a cause for adverse reactions towards dental cast alloys. Metals like nickel, palladium and cobalt rank high in allergy hit list. Nickel, for example, is considered one of the most common causes of allergic dermatitis and is responsible for more allergic reactions than all other metals combined. The element palladium is a known sensitizer with its sensitization rate in the range of 2-18%.

In this article, a patient’s allergic sensitivity to some dental base alloys and treatment procedure, similar to that reported by Bezzon, is reported.

Case Report

A 52-year-old woman, suffering for an unsatisfactory maxillary removable partial denture made of metal alloy based acrylic resin, has applied to our clinic. While reporting her history, it was the second prosthesis made in different dental offices in 1 year, but she couldn’t use, because of suffering from sore mouth and burning mouth. After intraoral examination, it was found that her intraoral tissues in contact with removable denture were hyperemic. Intraoral examination indicated denture stomatitis and allergic sensitivity to dental materials used for prosthodontic treatment.

Clinical examination revealed the need for rehabilitation of the maxillary and mandibular arches. For esthetic and functional reasons, the treatment proposed preparation of a combined fixed and removable partial denture with precision attachments. To find the appropriate material, the patient agreed to be submitted to a sensitivity test for determination of possible compatible alternative alloys. However, firstly the adequate intraoral hygiene should eliminate the hygiene sourced inflammation and erythema.
Table 1. Allergic sensitivity test results (Dental screening series)

1. Methyl methacrylate
2. Triethylene glycol dimethacrylate
3. Urethane dimethacrylate
4. Ethyleneglycol dimethacrylate
5. BIS-GMA
6. N,N-dimethyl-4-toluidine
7. 2-Hydroxy-4-methoxy-benzophenone
8. 1,4-Butanediol dimethacrylate
9. BIS-MA
10. Potassium dichromate XX
11. Mercury
12. Cobalt chloride
13. 2-Hydroxyethyl methacrylate
14. Goldsodiumthiosulphate
15. Nickel sulfate XX
16. Eugenol
17. Colophony
18. N-Ethyl-4-toluene sulfonamide
19. Formaldehyde
20. 4-Tolyldiethanolamine
21. Copper Sulfate
22. Methylhydroquinone
23. Palladium chloride
24. Aluminium chloride hexahydrate
25. Camphoroquinone
26. N,N-dimethylaminoethyl methacrylate
27. 1,6-Hexanediol diacyrlate
28. 2(2-Hydroxy-5-methylphenyl) benzotriazol
29. Tetrahydrofurfuryl methacrylate
30. Tin
Before the prosthodontic treatment, allergic sensitivity contact test (back-skin test) was carried out at the University of Istanbul, Faculty of Medicine, Allergy Department. Tissue reaction (eczema-like eruptions) occurred by alloys that contained Nickel, Chromium and Palladium at her back skin (Tab. 1). So the prosthodontic treatment should provide the esthetic, function and also wouldn’t cause any allergic reaction. Most of the alloys that are used for prosthodontic treatment, contain those metal ions. So, it was decided that titanium based removable partial denture and porcelain-fused-titanium fixed dentures could be used for prosthodontic treatment.

All of the teeth were prepared shoulder-type margin. Maxillary arch was treated by combined full titanium crown, porcelain-fused-titanium fixed dentures and titanium based removable partial denture with precision attachments (Fig. 5). Also, mandibular arch was treated with shortened arch and porcelain-fused-titanium fixed dentures instead of a removable partial denture, to supply better esthetic and comfortable prosthesis (Fig. 6). The prosthesis has been giving a satisfactory performance to the patient for the past 2 years (Fig. 7).

Discussion

The use of metal alloys in dentistry is a necessity. Usually, because of being cheap and easy to find, cobalt-chromium and nickel-chromium metal alloys are used so often. However, sometimes allergic sensitivity to those materials can be seen1-8. For the prosthodontic treatment of our patient, gold may be thought as another treatment choice. But, although titanium isn’t a cheap material, gold is even more expensive. Another reason why we didn’t use gold was due to the fact that gold alloys contain different metal ions to supply different physical properties. For example, gold alloys that are used for removable dentures contain 0-5% of palladium in alloy to harden the gold8. As mentioned before, the patient had allergic sensitivity to nickel, chromium and palladium. Because of these reasons it was concluded to use titanium based removable partial denture and porcelain-fused-titanium fixed dentures.

References


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