

Beaware of Disinfectant Allergy in Orthodontics ! A Case Report of an Uncommon Allergy

Ortodontide Dezenfektan Kullanımına Karşı Farkındalık ! Yaygın Olmayan Bir Alerji Vakası

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ABSTRACT

Common allergic reactions in orthodontics occur with orthodontic alloys, latex, acrylics and resin-based adhesive materials. However, allergic reactions to disinfectants are also common among hospital staff. The occurrence of such sensibilities also increased with the frequent use of disinfectants accompanying with routine sterilization methods in daily life. Disinfectants are commonly used components for the sterilization of many orthodontic materials. Therefore, it can be expected that this allergic reaction will be encountered more easily in orthodontics. However, disinfectant allergies that occur in patients during orthodontic treatment have not been reported in the literature so far. In this case report, a 15-year-old female patient, with no previous history of allergy, who had a reaction to disinfectant during the bonding stage is presented. Immediately after applying the braces, a type I allergic reaction with redness, irritation, itching and swelling on the lips had occurred. A positive result was obtained against the disinfectant with the diagnostic skin prick test. For this reason, the sterilization of all orthodontic materials used for the patient was changed by heating the sterilized materials and successfully completed without allergic reactions. This case demonstrates the importance of awareness for disinfectant allergies that can be life threatening during orthodontics.

Keywords: Disinfectant, Allergic reaction, Orthodontic treatment, Skin prick test

ÖZ

Ortodontide yaygın alerjik reaksiyonlar ortodontik alaşımlar, lateks, akrilikler ve rezin esaslı adeziv malzemelerle meydana gelir. Bununla birlikte, hastane personeli arasında dezenfektanlara karşı alerjik reaksiyonlar da yaygındır. Günlük hayatta rutin sterilizasyon yöntemlerine eşlik eden dezenfektanların sık kullanımı ile bu tür hassasiyetlerin ortaya çıkması da artmıştır. Dezenfektanlar, birçok ortodontik materyalin sterilizasyonu için yaygın olarak kullanılan bileşenlerdir. Bu nedenle ortodontide bu alerjik reaksiyonla daha kolay karşılaşılması beklenebilir. Ancak ortodontik tedavi sırasında hastalarda ortaya çıkan dezenfektan alerjileri literatürde şimdiye kadar bildirilmemiştir. Bu olgu sunumunda, daha önce alerji öyküsü olmayan, yapıştırma aşamasında dezenfektana reaksiyon gösteren 15 yaşında bir kadın hasta sunulmaktadır. Diş tellerini taktıktan hemen sonra dudaklarda kızarıklık, tahriş, kaşıntı ve şişlik ile tip I alerjik reaksiyon meydana geldi. Tanısal deri prick testi ile dezenfektana karşı pozitif sonuç alındı. Bu nedenle hasta için kullanılan tüm ortodontik materyallerin sterilizasyonu sterilize edilen materyaller ısıtılarak değiştirilerek alerjik reaksiyonlar olmadan başarıyla tamamlandı. Bu vaka ortodonti sırasında hayatı tehdit edebilen dezenfektan alerjilerine karşı farkındalığın önemini göstermektedir.

Anahtar Kelimeler: Dezenfektan, Alerjik reaksiyon, Ortodontik tedavi, Deri prick testi

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INTRODUCTION

Orthodontic patients are exposed to various biomaterials during orthodontic treatment. Some of these materials are known to cause allergic reactions, which can pose a health hazard to patients. The well known allergic materials in orthodontic practise are alloys such as nickel, latex, acrylic resins, and resin-based bonding materials.¹⁻⁵ Allergic reactions to disinfectants have generally been encountered in hospital staff rather than orthodontic patients.⁶ On the other hand; disinfectant use has increased widely among general population that obviously increase the probability for encountering disinfectant allergy in general. Disinfectants are used to disinfect many sensitive orthodontic materials that cannot be sterilized by heat. Allergic reaction to disinfectant in dentistry has rarely been reported.⁷ To our knowledge, no allergic reactions to disinfectant have

been reported in patients undergoing orthodontic treatment. Allergic reactions to disinfectant are usually manifested by mild dermal symptoms, but may also cause life-threatening anaphylaxis in case of repeated exposure.⁸⁻⁹ Initial symptoms generally appear 20–40 minutes following allergen exposure.¹⁰

CASE PRESENTATION

A 15-year-old female patient with an open bite applied to the orthodontics clinic due to aesthetic complaints. There was no history of previous orthodontic treatment and any previous allergic reaction.

Anterior open bite and tongue thrusting were observed on intraoral examination (Fig. 1a). She had a symmetrical face with competent lips (Fig. 1b and 1c).

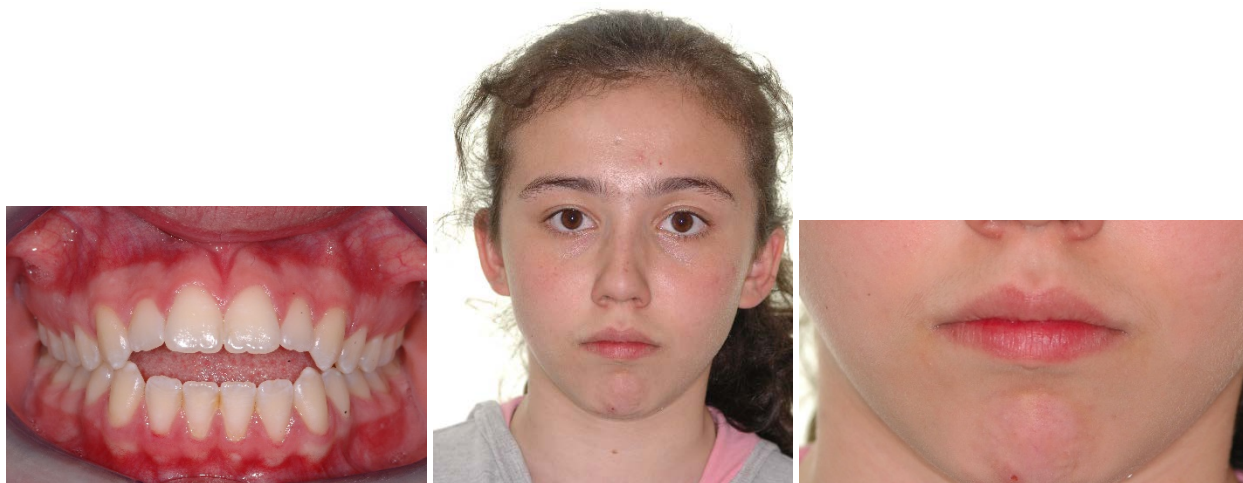


Figure 1. a, b, c. Initial intraoral (a), extraoral facial (b) and close-up (c) photographs before allergic reaction.

Orthodontic treatment with fixed orthodontic appliances as well as swallowing exercise were planned.

The mouth opener was placed and routine bonding was initiated. Towards the end of the bonding, approximately 30 minutes after the first bracket was placed, the patient began to complain of a mild itching on the upper lip area. Because the clinician suspected from an allergic reaction, it was questioned whether the patient had any respiratory difficulty. It was observed that there were no other symptoms. After direct bonding was finished, the lip was checked and there were no signs of swelling, but redness and itching were observed on the lip. The clinician kept the patient under examination for a while. All braces placed on the teeth were debonded due to swelling, excessive itching and redness on the lips that appeared after a few hours (Fig. 2a, 2b and 2c). The patient's complaint began to decrease on the same day and disappeared completely after a few days. Afterwards, the patient was referred to an allergy test, considering the

possibility of allergies to latex or nickel. There were no signs of allergies to these materials. The clinician then thought that this condition may be related to some residue of disinfectant on the mouth opener. This time, skin prick test was performed to determine whether the patient was allergic to disinfectant and a positive result was obtained. The active component of the disinfectant that came into contact with this patient was N-(3-Aminopropyl)-n-dodecylpropane-1,3-diamine, a commonly known disinfectant component. After a positive result, we examined the allergic potential of the active components of the disinfectant and found that there were allergic cases related to N-(3-aminopropyl)-n-dodecylpropan-1,3-diamine in the literature. After all these results, orthodontic treatment was started without the use of disinfectant. However, no allergic reactions were observed in the patient and the orthodontic treatment of the patient was successfully completed in 2.5 years without allergic reaction (Fig. 3a, 3b and 3c).



Figure 2. a, b,c. Extraoral facial (a) and close-up (b,c) photographs after allergic reaction.



Figure 3. a, b, c Final intraoral photographs.

In addition, informed consent was obtained from the patient for this clinical study.

DISCUSSION

Allergic reactions encountered in orthodontics are commonly related with nickel, latex, acrylic and resin based bonding materials.^{2,11,12} Disinfectants are a common part of sterilization of delicate orthodontic materials however an allergy to disinfectants is usually seen among hospital staff rather than orthodontics.^{3,6,7} This case presents the first report of allergic reaction to disinfectant during the start of orthodontic treatment in a 15 years old female patient with no previous history of an allergy.

Here, the active ingredient of the disinfectant with which the patient comes into contact was N-(3-Aminopropyl)-n-dodecylpropane-1,3-diamine, a commonly known disinfectant component. After a positive result, we examined the allergic potential of the active components of the disinfectant and found that there were allergic cases related to N-(3-aminopropyl)-n-dodecylpropan-1,3-diamine in the literature. Therefore we assumed that the patient's allergy is related to N-(3-Aminopropyl)-n-dodecylpropane-1,3-diamine. In addition,

the patient was advised to inform healthcare professionals about disinfectant allergy before any surgical operation, dental treatment, blood donation and have an x-ray. In our case, despite the fact that the disinfectant only touched the skin, she experienced a severe reaction. Therefore, a more serious allergic reaction may occur, especially if the patient comes into contact with the disinfectant during a surgical procedure.¹³

Considering the positive properties of disinfectants, the use of instrumental disinfectants is likely to continue to increase.¹⁴ Since disinfectant contents, such as N-(3-Aminopropyl)-n-dodecylpropane-1,3-diamine in this case or chlorhexidine which is used more, is not a pharmaceutical product, and therefore not documented during surgical or diagnostic procedures. It is quite possible that disinfectants may be overlooked as agents that cause allergic reactions.^{7,15} As a result, although hypersensitivity reactions caused by disinfectants are still not sufficiently recognized, sometimes a misdiagnosis of allergic reactions can be made.¹³ In addition, re-exposure of the patient to the active substance that may cause allergen in the future may increase the risk of a fatal outcome. Therefore, orthodontists should be aware that when using surface disinfectants, an allergic reaction to disinfectants may develop, and they should know how to diagnose and distinguish such reactions.

CONCLUSION

Increasing use of hygienic cleaners containing active ingredients of disinfectants in daily life has increased the risk of allergic reactions due to disinfectants. For this

reason, we believe that allergies to commonly encountered orthodontic materials, as well as allergies to disinfectants used, should be questioned and included in the anamnesis.

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