LICHERNOID REACTIONS DUE TO DENTAL RESTORATIVE MATERIALS

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ABSTRACT
The pathogenic relationship between the oral lichenoid reaction and dental restorative materials has been confirmed many times. Lichen planus-like lesions (oral lichenoid lesion, oral lichenoid reaction) can be caused by hypersensitivity to materials for dental restorations.

The aim of this study is to determine the effect of restorative dental materials removal on the lichenoid reaction development. In this case report we present two male patients who were referred to the Department of Oral Diagnostics and Maxillofacial Radiology, at the Faculty of Dental Medicine, Medical University Sofia. Both patients had lesions located on the tongue and buccal mucosa. The routine examinations together with patch tests for dental allergy were used. The patients showed hypersensitivity to Nickel (Ni), Cobalt (Co), Amalgam and Mercury (Hg). Removal of the positively reacting materials followed by new hypoallergenic restorations led to spontaneous healing.

The results have shown that the removal and replacement of these restorative materials do lead to remission of the symptoms and full healing of the oral lichenoid lesions. Close association between the lesion development and the dental materials which gave positive patch tests reaction was confirmed. A replacement of the problem causing restorations with hypoallergenic materials proved to be the reliable method for controlling the clinical symptoms and also led to a state of total healing of these two patients.


Keywords: Oral Lichen Planus, Oral Lichenoid Lesion, Contact Allergy, Dental Materials, amalgam fillings

Introduction
Dental restorative materials (metals, amalgam, resins, etc.) may cause contact allergy reactions in the mouth with different clinical presentation. There are many reports in the literature where oral lichenoid lesions could be provoked by hypersensitivity to dental restorative materials (6, 7) When the terms Oral lichen planus (OLP) and Oral lichenoid lesions (OLL) are used with same meaning by some authors, it is quite confusing. OLP is a chronic autoimmune disease, which affects the oral mucosa and presents with Wickam’s striae. Genesis of OLL (lichen planus like lesion) has not been an autoimmune one but can mainly be provoked by a contact hypersensitivity to amalgam and other dental materials and medication. OLP is an autonomic disease but often can develop from already existing OLL in the presence of some dental substance. Histopathologically OLP and OLL have similar features. The diagnosis of OLP is always made by clinical and histopathological investigation. The diagnosis of OLP can be given only by its clinical appearance. It is important that oral lichenoid reaction always disappear after the amalgam fillings are removed. Oral lichenoid reaction has often been reported in middle aged females than males.

In dental practice the oral lesions of such origin are common. Local inflammation is often due to the toxic, irritant or allergic effect, though dental restorative materials must satisfy strict biocompatibility specifications (13).

These oral lichenoid lesions included striated, reticular, plaque-like, erythematic, erosive, vesicular, and ulcerative forms. Patients’ complaints were of soreness, itching, an unpleasant metallic or battery taste, or pain (3).

The other clinical signs of contact hypersensitivity in the mouth vary from senses of “burning”, pain, dry mouth (burning mouth syndrome) (12) to quite obvious features of lichenoid reactions on the buccal mucosa, tongue and lips. Our goal was to define:

1. The clinical features of the oral lichenoid reaction present;
2. To evaluate the healing process after replacing the restorations with hypoallergenic ones.

Materials and Methods
Two male patients 55- and 60-year old with lichenoid lesions on the tongue and the buccal mucosa (Fig. 2) were investigated and treated (Fig. 1, Fig. 3).

Both of them were non smokers with modest alcohol usage (about 50-100 ml daily). The patients were referred to the Faculty of Dental Medicine, Department of Oral Diagnostics and Maxillofacial Radiology and gave their written informed consent. Both patients met the basic criteria:

- dental restorative materials in close proximity to the lesions;
- not having any autoimmune diseases;
- not using drugs known to cause similar reactions.

Fig. 1. Severe lichenoid reaction on the mucosa of the tongue- ventral view

Fig. 2. Lichenoid reaction on the right side of the tongue and on the buccal mucosa

Fig. 3. Severe lichenoid reaction on the mucosa of the tongue- dorsal view

Both patients reported sensitivity and discomfort of the oral mucosa, roughness of the tongue and xerostomia.

None of them had any skin lesions.

The first patient, 55-years old male, had nickel consisted fixed metal prosthesis, 3 resin composite fillings and 1 acryl partial denture. The other patient, 60 years old, had 4 amalgam fillings and 1 acryl partial denture.

Screening patch tests for dental materials (mercury, amalgam, methyl-metacrylate-MMA, nickel sulphate, cobalt chloride) as well as photographs were taken.

Routine patch tests chambers of allergens were implemented. Standard testing substances (Chemotechnique Diagnostics, Sweden) authorized by the ICDRG (International Contact Dermatitis Research Group) were used to determine contact hypersensitivity to the dental restorative materials. A small amount of each allergen (placed into a chamber) was applied on to the skin of the back for a period of 48 hours and fixated by hypoallergenic plaster to ensure close contact with the skin.

Based on the medical history and the clinical examinations a diagnosis of lichenoid changes in the oral cavity was made.

All materials in the oral cavity which gave allergic test reactions were replaced with tested materials which did not show any allergic reactions.

The patients took part in the study after giving a written informed consent according to the guideline of the ethics committee.

Results and Discussion

The results were read 30 min after removing the chambers from the back. The system marks are as follows: (-) negative, (?) doubtful, (+) weak reaction, (+++) strong reaction, (++++) strong reaction, (++++) extreme reaction. Both patients gave strong positive reactions (Fig. 4). The 55-year old patient had a dry mouth and pain for about two months since his new restorations were placed. He showed positive patch tests for materials included in the resin and the methacrylate dental materials, Nikel sulfate, CO. The 60-year old male also suffered from such a reactions after his dental treatment. He showed positive patch tests for mercury, amalgam fillings, and MMA.

A replacement of the dental restorative materials (amalgam fillings, nickel consisting bridges and crowns, MMA, resin composite) was suggested. Lesions healed or improved significantly, and symptoms resolved, in both patients after replacement of their restorations. In the following 3 weeks the lichenoid lesions showed quick remission and in about 2 months healed completely (Fig. 5, Fig. 6).

Conclusions

1. The pathogenic relationship between dental restorative materials causing reactions and oral lichenoid lesions, found in these patients, was confirmed. Several studies, mainly Scandinavian, have shown the benefit of replacing restorations in the healing process of lichenoid reactions. Complete healing of lichenoid lesions after replacement of dental amalgam in 28/62 (42%) patients with positive patch tests results and 3/15 (20%) with negative patch test results was reported by Laine et al. (8). Boleswka et al. (1) gave information about the details and the benefits of the replacement of amalgam restorations.
with resin composite and porcelain fused gold crowns, or the prevention of contact between amalgam restorations and the oral mucosa by an acrylic splint.

A close contact to amalgam fillings causes the occurrence of lichenoid reactions that are clinically and histologically very similar to lichen planus but the etiology of the first one is well determined. These oral lesions are probably the result of allergic reaction to leaking products (11).

2. The patch test detection method is able to demonstrate and prove the patient’s hypersensitivity to dental restorative materials. Patch testing when used properly often provides support for the diagnosis of allergic contact dermatitis (9). Patch test is considered able to show whether there is a risk of contact allergy reactions occurrence if certain materials are used in a particular patient (3).

On the opposite opinion are Issa Y. et al., which consider that a patch test seems to be of limited benefit as a predictor of such reactions (4, 5).

3. The intraoral allergens are to blame for the found lichenoid lesions.

4. The replacement of dental restorative materials with hypoallergenic ones led to disappearing of the symptoms of lichenoid lesions.

The adverse reaction from a dental restorative material can be either toxic/irritative or allergic in nature. Therefore the etiology of OLLs may represent the oral manifestation of a chronic irritation in some patients or to be the clinical result of a delayed hypersensitivity reaction in others. Allergic contact lesions represent a lymphocyte-mediated delayed type of hypersensitivity reaction that requires previous sensitization to the same material (3). In a study of Massone et al. (10) was found that nickel, cobalt, and potassium dichromate were the three most common sensitizers. Concomitant positive reactions were present at significant levels.

OLL may be provoked by dental restorations and the diagnosis depends mainly on the clinical findings including the lesion’s characteristics and relationship to restorations (3). Amalgam restorations with their mercury content also appear to be a major etiological factor.

5. One of the most important aspects of these lesions is their premalignant potential. A prospective follow-up study with application of strict criteria (including registration of tobacco and alcohol consumption) and long term follow up (not less than 5 years) is required to establish the premalignant nature of OLP and OLL (13).

Certain OLP and OLL undergo malignant transformation but the mechanisms are still unclear and controversial.

REFERENCES