Amalgam Associated Oral Lichenoid Reaction – A Case Report

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Abstract: Oral lichenoid reactions are considered variants of oral lichen planus and may be regarded as a disease by itself or as an exacerbation of an existing oral lichen planus by the presence of medication or dental materials. They represent a type IV hypersensitivity reaction and most commonly affect the oral mucosa in direct contact with an amalgam restoration. Oral lichenoid reactions can cause significant discomfort for the patient and hence dentists should be aware of their occurrence, diagnosis and management. We report a case of oral lichenoid reaction of the left buccal mucosa associated with an amalgam restoration on tooth #27. Complete healing of the lesion was noted following replacement of the amalgam with an intermediate restoration, followed later by a glass-ionomer restoration.

Keywords: amalgam, lichenoid reaction, oral lichen planus

INTRODUCTION

The human oral mucosa is often subjected to many noxious stimuli, either hot or cold, acidic or alkaline substances, spicy foods, among others. In the dental environment, substances identified as allergenic include local anaesthetics, antibiotics, restorative materials, and latex. (1) Silver amalgam has been used as a dental restorative material for over one hundred and eighty years and still remains the most commonly placed filling material in the world. (2) Its superior compressive strength and minimal technique sensitivity makes it an ideal material for posterior restorations and core build-ups. (3)

Pinkus (1973) first coined the term “lichenoid tissue reaction” to describe the histological pattern featuring damage to keratinocytes, now referred to as apoptosis, infiltrate of inflammatory cells in the connective tissue which may extend into the epithelium and keratosis or hyperkeratosis. (2,4) The oral lichenoid reaction is a lesion indistinguishable clinically and histologically of the oral lichen planus. However, most oral lichenoid reactions disappear when the causative substance (drug / restorative material) is eliminated. (1)

Oral Lichenoid Reactions (OLR) involve mucosae in direct contact with amalgam restorations. They generally represent a type IV hypersensitivity reaction. Most often the allergen is mercury, but occasionally, the response may be to one of the other components of the amalgam alloy such as copper, tin or zinc. (5) Mercury salts that accumulate in healthy and damaged oral mucosa
This case report describes a case of oral lichenoid reaction associated with an amalgam restoration in the left maxillary second molar.

**Case Report**

A 26 year-old male patient presented with a chief complaint of pain in relation to the upper left posterior tooth for the past one month. Clinical examination revealed a severely carious maxillary left second molar 27. After a detailed clinical and radiographic examination, root canal treatment of 27 was carried out. Silver amalgam was placed as a post-endodontic restoration (Figure 1).

![Figure 1: Amalgam restoration on 27](image1)

After seven days, the patient reported to the department with a complaint of burning sensation in relation to the maxillary left vestibule. Oral examination revealed presence of a reddish-white lesion on the left buccal mucosa, adjacent to the amalgam restoration (Figure 2).

![Figure 2: Lichenoid lesion on the left buccal mucosa in relation to 27](image2)

The lesion showed a reticular pattern with a reddish inflamed area surrounding it. It was non-scrapable and tested Candida negative. The patient did not have any other dental restorations in the mouth. The patient’s oral hygiene was fairly good. However, small vesicles were noted over the left angle of mouth and chin region (Figure 3).

![Figure 3: Vesicles around left angle of mouth and chin](image3)

A cutaneous patch test was done to detect contact hypersensitivity. Alloy powder and mix were tested separately on the skin on the back of the patient.

The patient reported back after 48 hours with a complaint of itching on the mix patch [Alloy + Hg]. The patches were removed and examined. A slight erythematous reaction was noted on the mix patch area. Allergy testing with respect to dental restorative materials revealed that the patient was allergic to silver and tin which are the major constituents of amalgam. A provisional diagnosis of an amalgam associated oral lichenoid reaction was thus made.
A biopsy was done to histologically confirm the nature of the lesion. Pathologic study of the lesion showed a squamous epithelium with irregular acanthosis and foci of parakeratosis, with marked spongiosis and exocytosis, and presence of lymphocytes in the stratum corneum. The underlying stroma showed a chronic inflammatory infiltrate affecting the basal layer. It was decided to replace the amalgam restoration with a non-metallic interim restoration and follow-up the case. A final diagnosis of amalgam-associated oral lichenoid reaction was thus made. The patient was informed of the condition and a decision to replace amalgam restorations with a non-metallic interim restoration was taken.

The amalgam restoration was replaced with a Type II Glass-ionomer restoration (Figure 4).

**Figure 4: Replacement of amalgam restoration with glass-ionomer restoration**

The patient was asked to report after one week for a follow-up. Following a week, the patient reported with relief of symptoms. On examination, there was a reduction in the size and severity of the lesion. There was also complete healing of the vesicles in the left angle of mouth and chin region. One more review conducted after 3 months revealed complete clinical healing of the lesion (Figures 5, 6).

**Discussion**

Oral lichenoid reactions are considered variants of oral lichen planus. They may be regarded as a disease by itself or as an exacerbation of an existing oral lichen planus, by the presence of medication or dental materials. Drugs such as beta-blockers, dapsone, oral hypoglycemics, non-steroidal anti-inflammatory drugs (NSAID’s), penicillamine, phenothazines and sulfonylureas have been associated with lichenoid reactions. Besides drugs, lichenoid reactions have also been associated with dental materials like amalgam, composite and dental acrylics. (6)

**Figure 5,6: Complete healing of lichenoid reaction following replacement of amalgam restoration**

OLRs are usually seen in middle-aged individuals, with a slight female predominance. (3,7) According to van der Waal (2009), OLRs can be classified into four types as follows: (i) amalgam restoration, topographically associated lesions, (ii) drug-related lichenoid lesions, (iii) lichenoid lesions in chronic graft versus host disease, and (iv) lesions that have a lichen planus-like aspect, but that lack one or more characteristic clinical aspects. (8)

The typical clinical presentation of both OLP and OLR can be reticular white patches, papules, or plaques with or without erosions or ulcerated areas. OLP is a more widespread condition involving many anatomical sites within the oral cavity (or elsewhere including skin and genitalia) and distinct from OLR. The clinical diagnosis is further complicated because similar oral lesions can occur as a result of drug-related lichenoid reactions or as graft-versus-host disease, discoid lupus erythematosus, and systemic lupus erythematosus. Diagnosis in such cases is facilitated by a detailed history, clinical findings, and immunohistological findings. (2)

OLRs caused by hypersensitivity to amalgam or its constituents typically have a clear anatomical relationship to the dental amalgam restoration, so they are usually unilateral and not symmetrical.
They are most commonly seen on the buccal mucosae and tongue where the covering lining mucosa comes in contact with restorations. The gingivae, palate, or floor of mouth, being sites further away from restorations, are rarely affected, and patients almost never have associated cutaneous symptoms. These clinical features help to distinguish OLR from OLP and other conditions. (2) The lesions can be asymptomatic or patients may occasionally complain of soreness or itching especially with hot or spicy food. (7) Certain oral complications such as metallic taste or dry mouth can be observed. (9)

Histopathologically, the presence of a mixed subepithelial infiltrate, in contrast to the strict lympho-histocytic infiltrate that defines OLP, and a deeper more diffuse distribution within the lamina propria and superficial submucosa is thought to serve as a marker of a lichenoid oral lesion. (8)

The diagnosis of OLR relies on important aspects, such as the clinical appearance of the lesions, the lack of migration, and the association with adjacent amalgam restorations. Although there is no specific test for diagnosing OLRs, skin-patch testing can be used to identify the allergen responsible for the hypersensitivity. Patch testing is done by using commercially available kits which are typically placed on the skin of the back or fore arm in wells and held in place for 48 hours with hypoallergenic adhesive tape. The test results are generally read at 48 and 72 hours but evidence has shown that late readings at 10–14 days can capture previously missed positive reactions. (2)

Management of lichenoid lesions for which a distinct cause can be found (amalgam, drug related, chronic graft versus host disease) depends, indeed, on the etiology. Replacement of amalgam restorations, anatomically related to the lichenoid changes, will usually result in regression within several months. (4,8) When the amalgam restoration is removed, it should be done using rubber dam, abundant irrigation and high aspiration volume to diminish exposition to the material. (1)

Conclusion

Despite the advent of new synthetic non-metallic restorative materials, silver amalgam remains the most widely used and cost-effective material in restorative dentistry, mainly due to its superior strength and minimal technique sensitivity. Local allergic reactions are rare, and when they occur, they can be eliminated by substitution with glass ionomer or composite resins. The scientific evidence available does not justify the discontinuation of the use of amalgam, nor does it recommend the removal and replacement of satisfactory amalgam fillings with other restorative materials.

References


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