Oral Lichenoid Lesions Associated with Amalgam Restorations: Two Case Reports.


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Case Report

Subject: Dental Sciences

Abstract:

Amalgam has been used as a dental restorative material since its inception in 1831 for people all over the world, with few adverse effects. It is good for dental use because it is strong, long lasting, well fitting, easy to handle, and cheap. Conventional silver amalgam restorations consist of 50% mercury and about 50% alloy powder containing silver, tin, copper, and zinc. Mercury and mercury compounds appear to be the most common allergens in amalgam, with the other metals being rarely responsible for allergic reactions.

Case description: Two clinical cases were diagnosed as related to OLL. In both cases, the patients were asymptomatic with lesion on the oral mucosa adjacent to the amalgam restorations. The treatment was carried out with lesions taking into consideration by replacing the amalgam restorations by other permanent restoration. A significant remission of the lesion was observed after 15 days in one case and after one month in the other, although the lesions in the oral mucosa did not disappear completely. Dentists should be aware of OLL occurrence close to amalgam restorations and should be able to diagnose it and recommend the best treatment option.

Keywords: Amalgam-associated, Amalgam sensitivity, Oral lichenoid lesions, Oral lichen planus,

Introduction:

Amalgam has been used as a dental restorative material since its inception in 1831 for people all over the world, with few adverse effects [1]. Despite various advancements in dental materials and introduction of newer restorations, dental amalgams remain the most commonly used posterior restorative material in dental practice. It is good for dental use because it is strong, long lasting, well fitting, easy to handle, and cheap. Dental amalgam is a metallic mass, which is formed by a mixture of liquid mercury and solid particles of a powder containing silver, copper, tin and zinc. Conventional silver amalgam fillings consist of about 50% mercury and 50% alloy powder containing silver, tin, copper, and zinc [2, 3]. Mercury and mercury compounds appear to be the most common allergens in amalgam, with the other metals being rarely responsible for allergic reactions [4, 5].

Many of the dental materials and medicaments contain substances that may induce hypersensitivity reactions of the oral mucosa or the skin [6-8]. Most of the toxic injuries are associated with the mercury content, and the dental literature has shown that amalgam restorations can be related to oral lichenoid lesions (OLL)[9]. These OLL are frequently observed in the tongue, gingival, and buccal mucosa that are in direct contact with amalgam restorations and should be able to diagnose it and recommend the best treatment option.

The clinical features associated with OLL may vary considerably, varying from white linear plaques associated with or without erythema to homogeneous white plaques or ulcerations [9]. In addition, more than one form can be present concurrently [13]. In relation to their symptomatology, these lesions can range from subjective discomfort to severe pain. However, OLL do not migrate and involve only the oral mucosa directly in contact with dental amalgam restorations, which is a differential diagnosis from the true lichen planus [14]. It is well known that the direct contact with metals can induce several
dermatoses, including hand dermatitis, palmoplantar pustulosis, and nummular dermatitis [9, 15]. Thus, the replacing amalgam by another metal-free material is essential for definitive remission of the associated lesion [10]. In the present paper, we report two cases of OLL caused by direct contact with amalgam restorations, which undergone clinical remission after the replacement of the amalgam by other tooth colored permanent restoration.

Case 1:
A 40 year old female reported to our institute with the chief complaint of pain and bleeding gums since 1-2 months. Silver amalgam restoration seen in some teeth i.e. 36. Now she is experiencing the bleeding and pain in gums since 1 month. Patient was unaware of the mucosal lesion in her oral cavity and has no symptoms associated with 36. The patient’s medical history revealed that she had under antihypertensive therapy. Family, social, personal history was non contributory. After keen clinical examination presence of single, diffused grayish white lesion revealed, on detail examination lesion was single, diffuse size approximately 3x2 irregular in shape, flat surface with characteristic feature of White Interlacing Line Pattern (Wickham’s Striae) appearance lesion on left buccal mucous membrane associated with buccal aspect of 36. Rest of oral mucosa was normal. Generalized marginal inflammation seen associated with mild to moderate calculus. Given the history and the close spatial association, a provisional diagnosis of an oral lichenoid lesion due to the dental amalgam filling in 36 (hypersensitivity reaction) and generalized marginal gingivitis was made. The cavities were restored with an intermediate restorative material (Kalsogen; DPI, Mumbai, India). Patient was reviewed after 1 month, and the lesion was resolved significantly. The cavities were finally restored with light-cured composite resin (P-60 3M ESPE), and lesion was completely healed after 5 month review.

Case 2:
A 28 year old female reported to our institute with the chief complaint that pain in lower left back region of the jaw since 3-4 days. The history revealed that of patient had undergone pain on mastication in the region of 36 & she also noticed that intermittent dull aching pain aggravates on cold foodstuffs. Then pain became continuous since 8 days and pain is aggravated on eating hot and cold food stuffs. This Patient was also unaware of the mucosal lesion in her oral cavity and has no symptoms associated with. In
past dental history there was history of extraction with 46, silver amalgam filling with 47, medical, social, and personal history was non contributory. Detailed clinical examination revealed that lesion present with single greisy white with characteristic feature of White Interlacing Line Pattern (Wickham's Straie) appearance, round to oval, 1cm in diameter, well defined smooth and shiny on right buccal mucosa, buccal aspect of 47. Other findings moderate stains and calculus, deep occlusal caries with 36,37 draining sinus with 36, missing 46 were noticed on the basis of clinical examination and history probable diagnosis given as Oral Lichenoid Lesions Associated With Amalgam Restorations of 47 and periapical abscess with 36 and 37. Here amalgam restoration replaced by other tooth colored restoration Harvard cement. Root canal treatment with 36,37 followed by Prosthesis. Patient was reviewed after 1 month, and the lesion was resolved at some extent, lesion was completely healed after 3 month review.

**Discussion:**

Dental amalgam is an alloy composed of a mixture of approximately equal parts of liquid mercury and a powder consisting of silver (~22–32%), tin (~14%), copper (~8%), and other trace metals, including zinc. [16] Elemental mercury has been used in clinical dentistry since 1830s when it began to be used in fillings. Dental amalgam now has been used for well over 180 years and remains the most commonly placed filling material in the world [17]. Many of the dental materials and medicaments contain substances that may induce hypersensitivity reactions of the oral mucosa or the skin [6,7]. The most common reaction to amalgam is the development of oral lichenoid reactions/lesions (OLRs/OLLs) involving mucosae in direct contact with amalgam restorations. An OLL generally represents a type IV hypersensitivity reaction [18,19]. Type IV hypersensitivity is often called a delayed type of hypersensitivity as the reaction takes a long period to develop and, in this case, could be months to years. Rather is a type of cell-mediated response. Mercury salts that accumulate in healthy and damaged oral mucosa [20] will cause this hypersensitivity reaction in only a susceptible minority of the population with resulting reticular white patches, papules, plaques, erosions, or ulceration, similar to that found in oral lichen planus (OLP)—hence the terminology lichenoid. These lesions can be asymptomatic or sore especially with hot or spicy food. Non specific toxic reactions, not as a result of hypersensitivity, can also manifest as OLL.

Hypersensitivity to dental amalgam is rare and according to Holmstrup is due to corrosion products of amalgam restorations, and it seems to be related to mercury in almost all cases, with only a few cases implicating silver, copper, or tin [21,22]. Little is known about toxic reactions to irritants such as dental amalgam or its constituents but it is thought they can develop if an irritant substance is in direct contact with the mucosa over several years. Clinically they resemble OLL’s which are caused by hypersensitivity reactions and can only be differentiated by exclusion based on a negative patch test [23]. Toxic reactions may be more common in amalgams with higher zinc content [24].

**Clinical features and differential diagnosis:**

OLP is a more widespread condition involving many anatomical sites within the oral cavity (or elsewhere including skin and genitalia) and distinct from OLL. Both OLP and OLL can be considered potentially malignant [25,26]. It is important for subsequent management to be able to accurately diagnose each condition. Typically the clinical presentation in both conditions can be reticular white patches, papules, or plaques with or without erosions or ulcerated areas. 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 (GVHD), discoid lupus erythematosus (DLE), and systemic lupus erythematosus (SLE). These conditions have a similar clinical appearance. Diagnosis is facilitated by detailed history, clinical findings, and immunohistological findings. It is beyond this paper to discuss these other conditions.

OLLs caused by hypersensitivity to amalgam or its constituents typically have a clear anatomical relationship to the dental amalgam fillings [27], so they are usually unilateral and not symmetrical. They are most commonly seen on the buccal mucosa 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 OLL from OLP and other conditions, but it can still be difficult for the clinician to make a clear distinction, if amalgam restorations are widespread in the mouth.
Patch Testing:

Patch testing may be useful to identify those patients with suspected hypersensitivity reactions to amalgam or mercury. However, studies investigating their usefulness have shown conflicting results. It is likely that these earlier studies may have failed to clinically distinguish OLP from OLL when ordering patch testing. The test should be carried out in a specialist dermatology or oral medicine centre and is achieved 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 standard tests take into account that mercury from amalgam restorations may be in the form of metal, organic substances, or organic salts. Few patients react to all three forms. There is no worldwide consensus regarding the allergens used but generally it is accepted that 5% amalgam and 1% ammoniated mercury are suitable for screening [27, 28, 29].

The anatomical relationship appears to be the most powerful predictor of an OLL, and studies have shown that 70% of patients who had strong physical relationship of their mucosal lesions to amalgam tested positive to amalgam or ammoniated mercury, contrasting with 3.9% with weakly associated lesions. Patch tests, however, will not be 100% reliable as false positives will arise. 3.2% of the general population appear to be sensitized to dental amalgam or mercury. False negatives will arise for the minority of toxic reactions noted to mercury.

Although a positive patch test may facilitate diagnosis of OLL caused by a hypersensitivity reaction, this can only be proved if resolution occurs after the offending amalgam has been removed. The resolution or partial resolution of lichenoid lesions following removal of amalgam restorations is. In one study lesions with direct contact with amalgam responded better when the restoration was removed than those exceeding the contact zone. Some benefit was noted in 97% of such patients regardless of the patch test result but complete healing was seen more often in patients who had a positive patch test [30]. In another study relief of symptoms as early as 2-3 days after amalgam removal was found but this could take up to 5 weeks [1].

Reports on acute or generalized sensitivity reaction to amalgam or its constituents are rare. One report stated that this could occur in susceptible individuals after inhalation or absorption of mercury vapour, for example, during or directly after placement of an amalgam filling. Symptoms include the development of a cutaneous, erythematous, urticarial rash affecting the face and limbs, usually on the flexural aspect [21].

Conclusion:

From these case reports it is evident that amalgam fillings may induce OLL due to adverse immunological effects. Amalgam restorations may induce lichenoid reactions in susceptible individuals. The typical appearance of these lesions usually confirms diagnosis in most cases. Clinical features as well as the results of skin patch testing against Hg and amalgam can help in diagnosis. Several studies have shown the benefit of replacing restorations on the healing of lichenoid reactions. Complete healing of lichenoid lesions after the replacement of dental amalgam, even today, with the advent of new synthetic non-metallic materials, silver amalgam is the most widely used and cost effective dental material in restorative dentistry. Local allergic reactions are rare, and when they occur, they can be eliminated by the substitution with another material. In both cases healing process occurred after removal of amalgam restoration and replacement of other restorative material. Oral lichenoid lesions may be symptomatic and sometimes asymptomatic so dentist should be aware of their occurrence, diagnosis, treatment.

References:
