

Title page

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Title: Oral Lichenoid Lesion in a Child

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Oral Lichenoid Lesion in a Child

Abstract :

Hyper sensitivity to amalgam has been reported in some individuals due to mercury released either by corrosion or electrochemical reaction which clinically presents as oral lichenoid reactions. Such lesions have been reported more commonly in elderly individuals. The article describes a case of oral lichenoid reaction in a 12 year adolescent. The probable causes, diagnosis and treatment of such lesions are discussed.

Oral Lichenoid Lesion in a Child

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 cheap¹. Conventional silver amalgam fillings consist of about 50% mercury and 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 reactions². The biocompatibility of dental amalgam or more specifically, the toxic and allergic potential of mercury, its main constituent has received tremendous attention in recent years³.

Biodegradation of dental materials is of fundamental importance to their biocompatibility because release of elements from them is nearly always necessary for an adverse reaction to arise. With amalgam alloys, mercury may be released due to dissolution, evaporation, corrosion or other form of degradation. Electrochemical reactions between amalgam and oral fluids; mechanical forces to which the restoration is subjected are major form of interaction that result in degradation of amalgam. The corrosion resistance of the alloy is due to formation of a protective oxide film. Under certain circumstances the stability of the protected film can be damaged and metallic mercury is released⁴. Released mercury is taken up by oral soft tissues. In some patients this results in toxic or allergic effects that present as *oral lichenoid lesions or oral lichenoid reactions (OLL)*⁵.

The clinical and histologic appearance is similar to idiopathic oral lichenplanus, a mucocutaneous disorder. But unlike oral lichenplanus, the lesion arises in proximity to amalgam restorations, especially which are defective. Though the exact etiology is not clear, it is said to be a form of allergic contact stomatitis². The lesion has been more commonly reported in elderly individuals. This case report describes a case of oral lichenoid reaction in a child patient.

Case report:

A 12 year old female patient had a complaint of burning sensation on left cheek for the past one week. Her medical history was not significant. Oral examination revealed presence of a

white lesion on left buccal mucosa. The lesions measured approximately 10mm in length at the level of occlusal plane of the occluding molars extending from the region corresponding to first permanent molar to second molar. The lesion showed a reticular pattern with a reddish inflamed area surrounding it (Fig 1). The patient had silver amalgam restorations on 16, 26 and 46. 36 had an amalgam restoration with secondary caries. (Fig 2 & 3) 11, 12 had a class III cavity and 37, 47 had Class I cavity. Patient's oral hygiene was fairly good.

A clinical diagnosis of oral lichenoid reaction was made. The parent was informed of the condition and a decision to replace amalgam restoration on 36 and 46 was made. Interestingly, the mother also had a history of white lesions occurring on buccal mucosa which subsided after the restorations were replaced with ceramic crowns.

At 3 month follow up the burning sensation had subsided and healing of the lesion was noted. At 6 month follow up normal mucosal appearance was seen.

Discussion

The term Oral lichenoid lesion (OLL) is commonly used to describe oral lichenplanus (OLP) lesions that develop in contact with dental restorations, lesions associated with medications, those with graft versus host disease and lesions associated with systemic diseases⁶. The prevalence of OLL is seven times higher in women than men. It is most prevalent in 45-65 year age group⁷. Clinical appearance is as white or red patch with pain and soreness accompanying in most cases. Four types are distinguished: reticular, erosive, atrophic and ulcerative. The most common areas of location are molar and retromolar areas of buccal mucosa and lateral border of the tongue. Lesions are in complete or parital contact with amalgam restorations³. Clinically and histologically the lesions cannot be distinguished from oral lichenplanus⁸. Lichenplanus is a cutaneous disease with or without oral manifestations. Oral lichenplanus has similar clinical manifestations except for the absence of amalgam restorations in proximity to the lesions. Patients are usually between 30-60 years, more commonly women. Lichen planus is thought to be a cell mediated reaction with T lymphocytes as the main effector cells⁹.

Topographical relationship between the lesion and restoration is the main difference between OLL and OLP when the medical status and type of lesions were similar. If OLL is related to a causative factor, the removal of this factor may result in resolution of the clinical

lesion. This contrasts with patients having OLP who may require palliative care and monitoring over many years. The premalignant nature of OLP is a major concern^{3, 10}.

The etiology of OLL is still uncertain. It may be oral manifestation of chronic irritation in some patients or clinical result of delayed hypersensitivity in others. Fernstrom et al¹¹ were the first of many authors to claim a connection between type IV allergy to mercurial compounds released from dental amalgam and OLP. Immunocytochemical studies support the notion that it is a true delayed hypersensitivity reaction with transepithelial route of entrance of haptens¹². The corrosion products are thought to act locally to alter the antigenicity of basal keratinocytes that then become the target for cell mediated autoimmune damage. Bolewska et al⁵ reported substantial accumulations of mercury were visible in both fibroblasts and macrophages as compared to patients with oral lichenplanus. Regardless of the cause, a long period of exposure seems to be required before OLL manifests.

Clearing of oral lesions after removal of amalgam restorations in such patients has been reported. This improvement was found within one week to 3 months of replacing amalgam restorations with greatest improvement when the lesion is in close contact with OLL⁸. The substitution of amalgam by another material is based upon a positive patch test to mercury and/or anatomical relationship with amalgam restoration. However the clinical value of epicutaneous patch test to materials used in dentistry is unclear and regression of oral mucosa lesions after removal of amalgam has been found regardless of the results of the patch test. Dunsche, et al⁷ suggest that the removal of amalgam fillings can be recommended in all patients with symptomatic OLR associated with amalgam fillings because an improvement or healing of OLR can be expected for 97% of patients if no cutaneous LP is present.

Patch test is often used for the diagnosis of allergic contact dermatitis. Allergic contact stomatitis is associated with actual or potential allergic hypersensitivity of the skin and hence patch test is often employed. Patch test results may vary substantially depending on the compound that is used. Patch testing to mercury compounds is problematic, with possibility of irrelevant irritant reactions. For example, mercury chloride used in patch tests has been suggested to be highly irritant². A limiting factor of the patch test is false positive or false negative results arising from the test methodology or concentration of the test compound. A positive test result to one compound of mercury does not imply a response to all compounds or mercury itself. Even patients with negative patch tests showed healing of lesion after

replacement of restorations. This was shown in a study by Issa et al.⁸ where they concluded that the patch test is a limited predictor of amalgam replacement. They also showed that the topographical relationship between lesions and restorations is a more useful prognostic indicator.

Parafunctional habits may also exacerbate lesions close to restorations. Psychological aspects, life style of patient, genetic susceptibility have also been proposed to be predisposing factors¹³. Immunological or toxic reaction to plaque accumulation on the surfaces of the restorations has also been suggested as a cause of OLL. Such lesions disappear with improved oral hygiene¹⁴. It is also noted that the restorations associated with lichenoid lesions are poorly contoured, corroded and old. Hence corrosion of amalgam restoration or perhaps the biofilm present on such restorations may contribute to the development of hypersensitive reaction rather than material itself¹⁵.

Substitute materials for amalgam include gold, composite, porcelain, glass ionomer and acrylic¹⁰. No material is absolutely safe and adverse reactions have reported to these materials also, but are far fewer than amalgam¹⁶. Removal of amalgam restorations in contact with OLL is sufficient for adequate healing in most cases. In long standing cases total removal of all amalgam restorations, even if it is not in contact with the lesion is recommended.⁷

Conclusion

Lichenoid reactions to amalgam have not been commonly reported in children. In case of a white lesion in proximity to amalgam restoration lichenoid reaction should be considered in differential diagnosis in children. The clinical appearance and healing of the lesion after replacement of amalgam restoration is diagnostic of this lesion. Dental amalgam has been proven to be an effective restorative material in wide range of clinical situations with considerable longevity. As lichenoid lesions due to amalgam have been reported in only minority of patients, amalgam can still be considered as a safe material.

Illustrations:

Fig 1: Lichenoid lesion in the left buccal mucosa



Fig 2: Amalgam restorations in upper arch



Fig 3: Amalgam restorations in lower arch



Fig 4: Healing of the lesion after the restorations on left side were replaced with composite



References

1. Smart ER, Macleod RI, Lawrence CM. Resolution of lichen planus following removal of amalgam restorations in patients with proven allergy to mercury salts:a pilot study. *Br Dent J* 1995; 178:108-112
2. Ronald Laeijendecker, Sybren K. Dekker, Piet M. Burger, Paul G. H. Mulder, Theodoor Van Joost, Martino H. A. Neumann, Oral Lichen Planus and Allergy to Dental Amalgam Restorations. *Arch Dermatol* 2004; 140: 1434 -1438
3. Issa Y, Brunton PA, Glennly AM, Duxbury AJ. Healing of oral lichenoid lesions after replacing amalgam restorations: a systematic review. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004 98(5):553-65.
4. Marek M. Interactions between dental amalgams and the oral environment. *Adv Dent Res* 1992; 6:100-9
- 5 Bolewska J Holmstrup P Moller- Madsen B Kenrad B Danscher G Amalgam associated mercury accumulation in normal oral mucosa, oral mucosal lesions of lichenplanus and contact lesions associated with amalgam. *J Oral Pathol Med* 1990; 19: 39-42
6. James J Ferguson MM Forsyth A Tulloch N Lamey PJ. Oral lichenoid reactions related to mercury sensitivity. *Br J Oral Maxillofac Surg* 1987; 25: 474-80
7. Dunsche A, I.Ka^o Stel, H.Terheyden, I.N.G.Springer, E.Christophers J.Brasch Oral lichenoid reactions associated with amalgam: improvement after amalgam removal *British Journal of Dermatology* 2003; 148: 70–76.
8. Issa Y, Duxbury AJ, Macfarlane TV, Brunton PA. Oral lichenoid lesions related to dental restorative materials. *Br Dent J.* 2005 26;198(6):361-6

9. Edwards PC, Kelsch R. Oral lichenplanus: clinical presentation and management J Can Dent Assoc 2002; 68: 494-499
10. Ibtisam Al-Hashimi, Mark Schifter, Peter B. L, David Wray, Michael Brennan et al Oral lichen planus and oral lichenoid lesions: diagnostic and therapeutic considerations Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007;103(suppl 1):S25.e1-S25.e12
11. Fernström AIB, Frykholm KO, Huldt S. Mercury allergy with eczematous dermatitis due to silver-amalgam fillings. Br Dent J 1962; 18: 204–6
12. Laine J, Kalimo K, Happonen RP. Immunocompetent cells in amalgam associated oral lichenoid contact lesions J Oral Pathol Med 1999; 28: 117-121
13. Ostman PO, Anneroth G, Skolgund A. Amalgam associated oral lichenoid reactions. Clinical and histological changes after removal of amalgam fillings. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996; 81: 459-465
14. Holmstrup P, Schiotz AW, Westergaard J Effect of dental plaque control on gingival lichenplanus. Oral Surg Oral Med Oral Pathol 1990; 69: 585-590
15. McCullough MJ, Tyas MJ. Local adverse effects of amalgam restorations. Int Dent J. 2008 Feb; 58(1):3-9.
16. Eley BM. The future of dental amalgam: a review of literature. Part 7: Possible alternative materials to amalgam for restoration of posterior teeth. Br Dent J.1997; 183: 11-14