

VITAMIN C THERAPY IN TREATMENT OF HYPERPIGMENTATION IN AMALGAM ASSOCIATED LICHENOID CONTACT REACTION: A CASE REPORT

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ABSTRACT:

Oral lichenoid reactions represent a type IV hypersensitivity reaction. Most commonly seen associated with amalgam restorations in direct contact with the oral mucosa. Oral Lichenoid Reactions can be confused with Oral Lichen Planus and hence oral physicians should be aware of their occurrence, diagnosis and management. We report a case of Oral Lichenoid Reaction of the right buccal mucosa associated with an amalgam restorations. Complete resolution of the symptoms was achieved after replacement of the amalgam with glass-ionomer restoration. Post inflammatory hyperpigmentation of the buccal mucosa was managed by Vitamin C therapy. Vitamin C is a potent antioxidant drug that can be used for the treatment of hyperpigmentation.

Keywords: Amalgam associated Oral Lichenoid Reaction, Post inflammatory hyperpigmentation, Vitamin C, Ascorbic acid

INTRODUCTION

The concept of Oral Lichenoid Reactions (OLR) is a broad terminology, used to define a number of diverse immune-mediated conditions which are linked together by overlapping clinical and histopathological features.^[1] The other mucosal lesions that belong to the OLR group are: Oral Lichen Planus, Oral Lichenoid Contact Reactions, Oral Lichenoid Drug Reactions and Oral Lichenoid Lesions of Graft-Versus-Host Disease.^[1] Each of the OLR is governed by different immunological mechanisms and is triggered by distinct causative factors,

although the pathological process will result clinically similar reaction pattern. Oral Lichenoid Contact Reactions are considered to be a delayed hypersensitivity reaction against dental materials, especially mercury-containing amalgam.^[2] Post inflammatory hyperpigmentation is frequently seen in OLR.^[3] The use of Vitamin C has been proved to be beneficial in treating post inflammatory hyperpigmentation.^[4,5] This case report describes a case of Oral Lichenoid Contact Reaction to Amalgam restoration and management of the associated hyperpigmentation using Vitamin C therapy.

CASE DETAIL:

A 38 years old female patient reported to the out-patient department with the chief complaint of burning sensation in right buccal mucosa since past one year. The burning sensation persisted throughout the day and worsened on eating spicy food. In the past, she used topical Triamcinolone Acetonide ointment 0.1%, Topical Tacrolimus ointment 0.03% and Topical Lignocaine gel, but there was no improvement. Her medical history was unremarkable and there was no history of any allergies. Intra oral examination revealed a diffuse greyish white keratotic lesion with interspersed pigmentation extending from right corner of the mouth to the mesial aspect of tooth # 4-7, measuring approximately 1 cm (supero-inferiorly) and 4 cm (antero-posteriorly) (Figure 1). Patient provided a positive history of vesicular eruptions at the site of the lesion. There was no history of past skin lesions.

On further dental examination, it was noticed that Amalgam restorations were present in teeth #1-8, #1-7, #1-4, #4-6 and #4-7 (Figure 2, 3), which were done two years ago. Based on the history and clinical examination a provisional diagnosis of Amalgam associated Oral Lichenoid Reaction was established and differential diagnosis of Oral Lichen Planus was also considered.

Incisional biopsy of the lesion on the right buccal mucosa was performed and the histopathological examination revealed atrophic stratified squamous parakeratinised epithelium. In the

epithelium basal cell degeneration and melanin incontinence was evident. A juxtaepithelial band of chronic inflammatory infiltrate comprising of lymphocytes was evident and all these histopathological features were suggestive of Oral Lichenoid Lesion.

All the Amalgam restorations were replaced with type II Glass Inomer Cement. After 4 days, there was significant decrease in the intensity of burning sensation. Clinical evaluation at one month follow up revealed reduction in the size of the lesion. However, the patient expressed concerned over the intraoral pigmentation which was associated with the lesion (Figure 4). As large area of the buccal mucosa displayed hyperpigmentation, it was beyond the capacity of laser ablation and hence use of alternatives were explored. The patient was prescribed Vitamin C 500 mg chewable tablets, to be chewed three to four times per day. This therapy was instituted for a period of two months after which the patient was reviewed and there was complete clinical resolution of hyperpigmentation. (Figure 5).

DISCUSSION:

The term lichenoid tissue reaction was first coined by Pinkus in 1973.^[6] Van der Waal,^[7] in his review, has described four types of oral lichenoid lesions; (i) amalgam restoration, topographically associated lesions, (ii) drug related lichenoid lesions, (iii) lichenoid lesions in chronic graft versus host disease (cGVHD), and (iv) lesions that have a lichen planus like aspect, but there is lack of one or more characteristic clinical aspects.

Pathogenesis of Lichenoid Reaction

Amalgam associated Oral Lichenoid Reaction is a type IV hypersensitivity reaction which may occur at any time between first 48 hours to few months to years. The sensitization occurs when the hapten first contacts the oral mucosa and memory T cells are activated in response to the initial exposure. The corrosion products of amalgam, such as mercury, zinc, copper and tin may act as haptens and lead to Oral Lichenoid Reaction.^[8] Mercury salts and other metal ions leach out from amalgam and penetrate the epithelial lining and bind with host keratinocyte surface proteins. This gives rise to a cell-mediated response in the susceptible individuals which is directed at basal keratinocytes.^[9] On subsequent exposure with the same allergen, a type IV hypersensitivity reaction may occur.^[8]

Amalgam Patch Test

A few authors have performed patch testing which may be helpful to conform suspected hypersensitivity reactions to amalgam or mercury. However, their usefulness is uncertain as investigating studies have shown conflicting results with substantial number of false positive results.^[9] This is why Amalgam patch test was not carried out in the present case. The test should be carried out 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 read at 48 and 72 hours. A skin reaction with erythema,

effusion and papulo-vesicular reaction is considered a positive reaction.^[9]

Management

Management of oral lichenoid contact lesions is primarily based on elimination of the distinct etiological factor. Replacement of amalgam restorations which are in close proximity to the lesion will eventually result in regression of the lesion. Several published cases have reported complete reversal of the oral mucosal changes after removal of the offending amalgam restorations.^[8,10,14] Ahmed S *et al.*^[14] reported association of pigmentation with amalgam associated oral lichenoid lesion whereas there is no mention of post inflammatory hyperpigmentation in other case reports.^[8,10,13]

Role of Vitamin C

In the present case, extensive melanin pigmentation was noted which was treated with Vitamin C. With regards to healing of OLR, it is believed that the main reason for hyperpigmentation could be post-inflammatory changes. After an inflammatory reaction, there is excessive melanin production, abnormal distribution of melanin and presence of more melanophages which could cause hyperpigmentation of the mucosa after inflammation. The probable mechanism that has been suggested for the stimulation of melanocytes is due to the cytokines released by the sub-epithelial band of lymphocyte.^[15]

Vitamin C is an abundantly naturally occurring antioxidants in nature. Its natural

sources primarily citrus fruits, strawberries, green and leafy vegetables.^[5] The chemically active form of Vitamin C is L-ascorbic acid. The absorption of Vitamin C occurs in the intestines but only a limited amount of the drug is absorbed by an active transport mechanism despite of high oral dosage.^[5] Vitamin C administration can result in depigmentation as it interrupts key steps in the process of melanogenesis. It interacts with copper ions at the tyrosinase-active site and inhibits action of tyrosinase enzyme, thus decreasing the formation of melanin.^[5] Sheel V *et al.*^[4] treated one case of gingival pigmentation using combination of surgery and topical application of ascorbic acid. Yussif NM *et al.*^[16] conducted an *in vitro* experiment to study the effect of vitamin C on hyperpigmentation. They concluded that Vitamin C can reduce the function and productivity of the melanocytes. Apart from its role as depigmenting agent, Vitamin C can be also used as an antioxidant and for synthesis of collagen. Vitamin C is commercially available as creams, serum and transdermal patches.^[5] Oral formulations are available as 500 mg chewable tablets. Vitamin C is very safe to use for long periods as the toxic doses of Vitamin C that may cause cellular apoptosis as seen under laboratory conditions are 100-200-times the daily recommended dose.^[7]

CONCLUSION:

Amalgam associated Oral Lichenoid reaction is a distinct entity. Although clinically it may present with features

similar to other red and white lesions, accurate diagnosis can be established by thorough case history, ascertaining the placement of amalgam restorations, clinical appearance and histopathological findings. In this case report, Vitamin C therapy was successfully used to treat post inflammatory hyperpigmentation due to amalgam associated oral lichenoid reaction in oral mucosa. It is advised to further explore the possibilities of use of Vitamin C as depigmenting agent by conducting randomised controlled trials on suitable sample.

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FIGURES:



Figure 1: Pre-treatment Photograph Of Right Buccal Mucosa Showing Greyish White Lesion



Figure 2: Pre-treatment Photograph Of Maxillary Arch Showing Amalgam Restorations



Figure 3: Pre-treatment Photograph Of Mandibular Arch Showing Amalgam Restorations



Figure 4: One Month Post-treatment Photograph Of Right Buccal Mucosa Showing Hyperpigmentation After Replacement Of Amalgam Restorations



Figure 5: Two Months Post Vitamin C Therapy Photograph Of Right Buccal Mucosa Showing Resolution Of Hyperpigmentation