

Allergy to Mercury from Dental Amalgam: A Case Report

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ABSTRACT

Aim: This case report presents an incidence of mercury sensitisation in a female patient who underwent amalgam restorations in her maxillary and mandibular molar teeth.

Summary: Dental amalgam has been used as a restorative materials since more than 150 years as it is durable and inexpensive. It may cause a Type IV hypersensitivity or contact dermatitis in some patients who may have been sensitised to mercury from a dental or nondental source previously. The allergy may affect both the dental personnel and the patient. It may manifest intraorally as a lichenoid reaction or extraorally as rashes and itching on neck, face and flexural surface of limbs. The condition is rare and should not be confused with mercury toxicity. Unnecessary removal of sound amalgam restorations in healthy patients is not justified.

Keywords: Amalgam, allergy, hypersensitivity, lichenoid reaction, mercury.

INTRODUCTION

Although concerns have been there due to the presence of mercury as one of its constituents, dental amalgam has been used as a direct restorative material since 1831.¹ Mercury is a weak sensitizer and contact with its salts as chloride or



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Date of Submission: 04-04-2012

Reviews Completed: 12-10-2012

Date of Acceptance: 20-11-2012

ammonium chloride may result in hypersensitivity reactions leading to Coomb's Type IV hypersensitivity or contact dermatitis.² Contact dermatitis is a local inflammation of the skin characterised by itching, pain, redness, swelling or wheals. The inflammation is caused as a result of materials that come in direct contact with the skin.³ In the case of allergy to mercury, the lesions usually start as early as few hours to 1 to 2 days after exposure. Intraorally, burning sensation, mucosal swelling, oozing eczema or erosion may occur in an area with direct contact with silver amalgam fillings.⁴ True mercury allergy is rare and females are affected more than the males.² This case report presents an incidence of mercury sensitisation in a female patient who underwent amalgam restorations in her maxillary and mandibular molar teeth.

CASE REPORT

A systemically healthy, non smoker, 23 year, female patient reported to the department of conservative dentistry with the chief complaint of an ulceration on her right buccal mucosa and itching and rashes around the corner of her lips since two days. Her past dental history revealed that she had undergone restorative treatment on her mandibular posterior teeth two days back. Clinical examination showed class I silver amalgam restorations on right maxillary first molar (16), right mandibular second molar (47) and right mandibular second molar (48). Around, erythematous lesion was detected on her right buccal mucosa in the vicinity of the teeth having amalgam restorations (Fig. 1). On extra-oral examination, eczematous rashes could be seen bilaterally around the corner of her lips and vermilion border of her lower lip (Fig. 2 and 3). Thorough history was taken to rule out any other skin disease or bruxism. There were no sharp cusps and occlusion was normal. The buccal mucosa on the other side and palate was healthy. Also, the patient did not experience any allergic reaction when she had visited the dental office earlier for oral prophylaxis and interim restorations comprising of type II zinc oxide eugenol cement. The patient reported that the lesion and the rashes developed few hours after the restorations and were more pronounced initially. The extraoral rashes were accompanied by itching and redness. The problem had become milder by the time she reached the dental office after two days. The clinical picture and history of the patient were suggestive of contact dermatitis extraorally and a mild contact stomatitis reaction to amalgam intraorally.



Figure 1: Intraoral photograph showing erythematous lesion on right buccal mucosa in vicinity of amalgam restorations.



Figure 2: Rashes on vermillion border of lower lip.

The restorations were removed under rubber dam isolation and high vacuum suction and replaced by a high strength glass ionomer cement (Fuji IX, GC, Japan) as an interim restoration. After two weeks when the patient reported with relief in symptoms both extraorally and intraorally, the glass ionomer cement restorations were reduced to a base and tooth was restored with a posterior composite (Filtek P60, 3M ESPE, UK).

DISCUSSION

Allergy to various materials used in dentistry such as latex, base metals, eugenol, methacrylates, and even gutta percha has been documented by various authors.^{5,6} Silver amalgam is an alloy of many metals such as silver, tin and copper, mercury and any of these can be a cause of an allergic reaction in the patient. In a study amalgam was found to be a source of allergy in 3% patients, and 37% of the patients were sensitive to mercury alone.² Mercury in vapour form is released during



Figure 3: Rashes on left angle of mouth and cheek.

trituration, condensation and polishing procedures, and can affect a larger area of skin of the patient or health care worker. Sensitisation to mercury is a rare phenomenon with a prevalence of approximately 3%, and has been reported in dentists, auxiliaries, dental students and patients having amalgam restorations.² It still remains a trusted restorative material because it is strong, durable, and relatively inexpensive. It is considered a safe material but debate over its use arose because of the continuous low-level release of mercury, approximately 1.2 microgram/day as vapour form and 1.5 microgram/day as ingested form which is much below the average daily intake from non-dental sources such as food, dyes, cosmetics, disinfectants, bulbs, thermometers etc.⁸ Oral lichen planus or oral lichenoid reactions (OLR) may develop in cases of prolonged contact of amalgam restorations with oral mucosa. Patients with amalgam-induced OLR are often hypersensitive to mercury compounds, and a previous sensitisation may have occurred due to earlier contact with mercury.⁹ A patch test containing mercury or other constituents of amalgam may be helpful in screening of patients with OLR, but not required for patients showing immediate hypersensitivity. Memory Lymphocyte Immuno Stimulation Assay test (MELISA®) is a modified lymphocyte stimulation test, that is used to measure immunological sensitisation induced by metals and to screen such individuals.¹⁰

The incidence of hypersensitivity to amalgam or mercury should not be confused with mercury toxicity. The amount of mercury released daily from amalgam restorations is only 1% of the dose decided by WHO for the work environment (TLV= 50 microgram Hg/ m³).¹¹ Every effort should be made in the dental office to reduce the concentration of volatile mercury by having proper ventilation and high volume suction and proper use of barrier technique like eyewear, masks, gloves etc. for the dental personnel. Antihistaminics have been found to be less effective in such cases and topical glucocorticoids

such as clobestol proprionate may be useful. A pharmacologically inert protective ointment composed of a silicone polymer, dimethasone (Dermashield) can be applied over exposed areas of skin by the dental personnel known to be sensitive to amalgam.¹² Proper handling of amalgam during restorations such as using high copper alloys, removing and polishing restorations under air water spray and intermittent use of rotary hand piece should be practiced.¹³ Amalgam scrap should be kept in covered containers filled with spent fixer solution or under sulphide solution.¹⁴ Dental students and personnel should be trained to take careful history of the patient about any previous oral or skin lesions or allergy before giving amalgam restorations,² to prevent the incidences of such reactions.

Careful history and proper in-office handling of amalgams can prevent such cases and even if an allergy develops, it can be easily replaced by some other material like glass ionomer, composite or gold. Though environmental concerns over the use of dental amalgam have surfaced, scientific literature still considers it as a safe material for dental restorations and does not support injudicious practice of unnecessarily replacing sound amalgam restorations in healthy individuals.

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