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Mercury Amalgam Dental Filling-Induced Contact Dermatitis- A Case Report

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Abstract

Background: Dental amalgam is a commonly used restorative material due to its durability and cost-effectiveness; however, its mercury content may rarely trigger hypersensitivity reactions such as allergic contact dermatitis in susceptible individuals. Despite its widespread use, mercury-induced contact dermatitis remains underreported and poorly recognized, and the limited literature describing its clinical features, diagnostic approach, and management contributes to delayed diagnosis and low clinical awareness. This case report aimed to describe the clinical presentation, diagnostic evaluation, and outcome of mercury amalgam dental filling-induced contact dermatitis to improve recognition of this uncommon entity.

Case Presentation: A 45-year-old male developed an intensely pruritic unilateral maculopapular eruption over the right chest and dorsal back nine days after placement of mercury amalgam restorations in the lower right molars. The eruption showed erythema, papules, and excoriations without systemic symptoms or alternative triggers. The temporal and anatomical correlation suggested a delayed-type hypersensitivity reaction, and patch testing was recommended for confirmation.

Conclusion: This case highlights a rare instance of mercury amalgam-induced contact dermatitis presenting as a localized delayed hypersensitivity reaction. Clinicians should consider dental materials as potential etiological factors in unexplained cutaneous eruptions to ensure timely diagnosis and appropriate management.

Keywords: Dental Amalgam; Contact Dermatitis; Delayed Hypersensitivity; Patch Tests; Dental Restoration; Mercury; Case Report.

Introduction

Dental amalgam has been a popular choice in dentistry as it's durable and affordable. It consists of around 50% mercury blended with silver, tin, copper, and some other metals. This combination makes it super strong and long-lasting. Although there's an effort to cut back on its use for greener alternatives, it is still widely used due to its reliability and low cost (Mehedinti et al., 2026; Nicholson, 2023)

As dental amalgam is considered as safe, many individuals are concerned about the possible effects of mercury that can leak out from fillings. Most studies look at lower level mercury exposure and its toxins, yet allergies to amalgam are observed in susceptible or immunocompromised individuals (Berlin, 2020; Li & Li, 2021; Lisiecka, 2025). Allergic contact dermatitis, a type of reaction triggered by T lymphocytes after being exposed to mercury or other metals in teeth fillings, falls into this category. Though rare, these allergic reactions can really impact those affected (Berlin, 2020; Li & Li, 2021; Lisiecka, 2025).

Hypersensitivity reactions to dental materials can exhibit in numerous ways, such as oral lichenoid lesions, mouth redness, stomatitis, skin rashes around the mouth, eczema, and general skin eruptions. Diagnosis is challenging since the symptoms look a lot like other dermatological, allergic, or autoimmune issues. Hence, doctors require a detailed dental and medical history, a thorough examination, and conduct laboratory tests like patch testing (Rama & Cernadas, 2020; Reinhart et al., 2020). A recent study shows that while uncommon, contact allergies to dental materials are still important for patients with unexplained oral or skin symptoms (Forkel et al., 2024).

Although dental amalgam restorations are widely used and generally safe, allergic reactions like contact dermatitis are rare and often go unnoticed. As the allergic responses from these amalgams are misdiagnosed, often mimicking other skin issues, leading to delays in diagnosis and proper treatment. Previous reports, such as by Yasuhiko Fujii, showed that by getting rid of certain dental restorations can cure serious skin rashes. Despite this, there's still not enough evidence from clinical studies about how to recognize, diagnose, and manage contact dermatitis caused

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by mercury amalgam (Fujii, 2017). Therefore, this case report describes a patient with contact dermatitis from a mercury-containing dental amalgam filling. It covers their symptoms, diagnosis, treatment, and recovery. The main objective of this case report was to add to current knowledge and highlight that dental materials can cause unexplained skin reactions.

Case Presentation

Patient History and Initial Presentation

A 45-year-old male with no significant past medical history presented to the dermatology clinic with complaints of an acute-onset pruritic skin eruptions. The patient reported an intensely pruritic skin rash localized to the right side of the chest and the right dorsal back.

History of Present Illness

Nine days before the onset of the skin manifestations, the patient underwent placement of mercury amalgam restorations in the lower right posterior teeth (lower right molars). The dental procedure was uneventful, and no immediate complications or systemic symptoms were reported following the restoration placement.

Approximately nine days' after the dental intervention, the patient developed an intensely pruritic maculopapular eruption involving the right chest wall and right dorsal back region. The eruption was associated with erythema, edema, and multiple popular lesions accompanied by excoriation marks secondary to scratching. The patient denied recent exposure to known allergens, initiation of new medications, or changes in personal care or hygiene products.

Clinical Assessment and Correlation

Temporal Relationship

A nine-day interval was observed between the placement of the mercury amalgam restorations and the onset of the dermatological manifestation, consistent with a delayed-type (Type IV) hypersensitivity reaction.

Anatomical Correlation

The skin eruption was confined to the right side of the chest and right dorsal back, corresponding to the ipsilateral side of the recently restored lower right teeth.

Absence of Systemic Involvement

The patient reported no constitutional symptoms, fever, or involvement of other body regiobs

Physical Examination

Dermatological examination revealed a localized erythematous maculopapular eruption involving the right anterior chest and right dorsal back (Figure 1).

Figure 1: Unilateral erythematous maculopapular eruption on the right chest and dorsal back, appearing 9 days after ipsilateral mercury amalgam restoration placement, consistent with a delayed-type (Type IV) hypersensitivity reaction.

Lesion Morphology

The eruption consisted of scattered papules measuring approximately 0.3-0.8 cm in diameter, surrounded by erythema.

Associated Findings

Evidence of excoriation secondary to scratching was noted. Hyperpigmentation was also visible on the lower portion of the right thigh in the clinical images.

Distribution Pattern

The lesions demonstrated a predominantly unilateral (right-sided) distribution. This pattern was consistent with contact dermatitis and was considered unusual for a generalized systemic eruption.

Diagnostic Evaluation

Based on the clinical presentation and the temporal association between the recent placement of mercury amalgam restorations and the onset of the cutaneous eruption, patch testing was recommended to further evaluate a possible hypersensitivity reaction to dental materials.

Discussion

Although there are many efforts underway to minimize the use of dental amalgam, it is still one of the most commonly used restorative materials in dentistry due to its environmental concerns. This case report demonstrates an unusual clinical illustration of contact dermatitis, presenting as a pruritic, maculopapular eruption shortly after placement of mercury amalgam restorations, with a definite temporal relationship to dental treatment, and no other known factors. The fact that symptoms occurred shortly after the amalgam filling and the localized nature of the skin reactions are consistent with a hypersensitivity reaction to the components of the dental filling.

Dental amalgam has a long history of safety when used as a restorative material, but some people may experience an adverse biological reaction, such as a hypersensitivity reaction. The toxicological risk from release of mercury from dental amalgam is generally low, but immunologically mediated reactions cannot be neglected, as this is a clinical entity (Berlin, 2020). In the present case, the local dermatological findings indicated hypersensitivity but no systemic mercury toxicity was found.

The nine-day delay period from amalgam placement to onset of symptoms suggests a delayed hypersensitivity type reaction. This observation is consistent with the results of the immunopathogenesis of allergic contact dermatitis described by Li and Li (2021), and Lisiecka (2025), who revealed delayed immune-mediated reactions as one of the main mechanisms involved in allergic reactions caused by dental materials (Li & Li, 2021; Lisiecka, 2025).

Additionally, the unilateral erythematous maculopapular eruption seen in our patient is a part of the spectrum of extraoral manifestations seen in hypersensitivity reactions to dental materials. Dental-material allergies have been described as having similar dermatological presentations suggesting that there may be some cases where there is no significant oral involvement (Rama & Cernadas, 2020; Reinhart et al., 2020).

Several studies have reported allergic reaction to dental materials and metals. Forkel et al. (2024) have shown that contact allergy to dentals is still clinically significant in patients with non-specific oral and skin reactions (Forkel et al., 2024). Similarly, Olms et al. (2019) noted that metal-containing dental restorations may be sensitizing agents, and should be taken into account when evaluating suspected allergic reactions (Olms et al., 2019). Al-Gawahiri et al. (2024) also highlighted that contact allergy continues to be clinically important in dental patients and these patients may require careful assessment of the dental restoration when they present with similar symptoms (Al-Gawahiri et al., 2024). The result of the present case is in concordance with the observations made in the above mentioned studies.

The present case is similar to that of Fujii (2017) in which severe dermatitis was reported after removal of dental restorations suspected to cause metal hypersensitivity and cross reactivity (Fujii, 2017). The onset of symptoms after amalgam placement in our patient is compatible with previous reports that dental metals may cause reactions in susceptible patients, though the exact allergenic component has not been determined. In addition, Thanyavuthi et al. (2016) reported that 13 patients with oral lichenoid lesions were found to be hypersensitive to certain constituents of amalgam, which gives further evidence that allergic reactions to amalgam can present in a variety of forms (Thanyavuthi et al., 2016).

There is also a recognition of the allergic potential of dental materials through occupational studies. Dental materials are potential sensitizers, as reported by Warshaw et al. (2022), who state that dental personnel may develop occupational contact dermatitis due to repeated exposure to metals and dental substances (Warshaw et al., 2022).

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While our patient had no occupational exposure, the results are consistent with the biological plausibility of allergic reactions to metals. Conversely, Sun et al. (2022) reported excessive mercury exposure as a cause of allergic and irritant contact dermatitis, which indicated that mercury-containing materials can cause allergic and irritant dermatitis in different pathogenic mechanisms (Sun et al., 2022).

Conclusion

This case highlights a very rare case of mercury amalgam dental filling-induced contact dermatitis that appeared as a unilateral pruritic maculopapular rash with a definite time association to dental fillings placement. The findings confirmed that dental amalgam is safe, however it can cause delayed type IV hypersensitivity reactions in vulnerable individuals. Prompt recognition of the dermatological effects of dental materials is critical for timely diagnosis, proper evaluation of dental allergies and prevention of exposure through multidisciplinary management.

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Author Contributions: M. A. M. H: Conceptualization, Investigation, Data Curation, Writing- Original Draft, Writing- Review & Editing, Visualization, Supervision, and Final Approval of the Manuscript.

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