CASE REPORT
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Rare Allergic Reaction to Local Anesthesia: A Case Report

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ABSTRACT

One of the most commonly used local anesthetic (LA) agents in dentistry is lidocaine. Hypersensitivity reactions to lidocaine have been reported. In such cases, it is crucial to record a detailed clinical history and perform allergy testing to select a suitable alternative LA agent.

This report presents the experience of observing a case of lidocaine allergy, supported by a review of the literature on the condition. A rare case of delayed hypersensitivity reaction to lidocaine is reported, where the patient exhibited swelling and erythema of the upper labial mucosa. Intradermal testing confirmed an allergic reaction to lidocaine.

The patient was successfully treated with an alternative LA agent, allowing for the completion of dental procedures without complications. This highlights the importance of careful diagnostic measures to manage such rare but significant allergic reactions effectively.

This case highlights the importance of recording a proper clinical history and performing allergy testing before the administration of LA to prevent severe allergic reactions. Additionally, patients identified as allergic to LA agents should be thoroughly counseled, informed about their condition, and provided with a clear explanation of all available treatment options

Keywords: Clinical history; Delayed hypersensitivity; Lidocaine; Local aesthetic

INTRODUCTION

Dental healthcare professionals widely use local anesthesia to perform various dental procedures comfortably, safely, and efficiently.[1] However, local anesthetic agents (LAs) can cause various side effects, including immune response-mediated allergic reactions and non-immune reactions such as toxic and autonomic responses.[2] The incidence of adverse effects from LAs is reported to be 0.1-1%, with allergic reactions accounting for less than 1%, highlighting their rarity.[2]

Given the potential impact of such situations, we report a case of a patient who tested positive for a lidocaine allergy via a skin test - an extremely rare condition that many practitioners may lack experience

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in managing. Since LAs are the most commonly used drugs in daily dental practice, clinicians must be well-versed in recognizing the symptoms of various allergic reactions.

CASE PRESENTATION

An 18-year-old female patient, weighing 48 kg, visited our clinic at Jouf University, Sakaka, Saudi Arabia, with a chief complaint of redness, swelling, and fluid-filled eruptions on the upper labial mucosa, which developed two days after receiving dental treatment. The patient had visited another dental clinic two days prior for pain in her maxillary anterior tooth (tooth number #11), where root canal treatment was recommended, and LA was administered (Lidocaine HCl 2% with Epinephrine 1:100,000; Brand Name: MediS Lidocaine with Adrenaline, Manufacturer: MediS, Riyadh, Saudi Arabia). Approximately three hours after the procedure, she experienced discomfort in the same region, followed by mild swelling of the upper lip. This gradually worsened, leading to the formation of fluid-filled eruptions on the upper labial mucosa over the next two days. Her past medical history was unremarkable, and her vitals were stable upon examination. Extra-oral examination revealed diffuse erythema and swelling of the upper lip. Intra-oral examination showed a fluid-filled bulla measuring approximately 2 X 2 mm on the maxillary labial mucosa (Figure 1).

Given the localized progression of her reaction and the history of LA administration in the same region, a provisional diagnosis of an allergic reaction was made. Although the patient was taking medications such as amoxicillin and paracetamol, she reported no history of adverse drug reactions or allergies to these medications. A skin prick test with lidocaine revealed a wheal-and-flare reaction, confirming a hypersensitivity reaction. Based on this clinical confirmation, 1-2.5 mg/kg hydrocortisone and fexofenadine 180 mg tablets (Saudi Arabia) were prescribed once daily for seven days, leading to a resolution of her symptoms (Figure 2).

Given the findings, the patient was referred to the Department of Dermatology to confirm the diagnosis and rule out other potential allergic reactions before proceeding with definitive treatment (root canal treatment of tooth #11) under LA. The Department of Dermatology confirmed hypersensitivity to lidocaine, mepivacaine and bupivacaine.

As a result, procaine, an ester compound, was selected as a substitute for lidocaine, an amide derivative, for performing the root canal treatment. The patient was monitored closely for vital signs during and for approximately three hours following the procedure, with no signs of allergic reactions observed. She was subsequently discharged with instructions to self-monitor for any symptoms and to report to the clinic immediately if any reactions occurred.

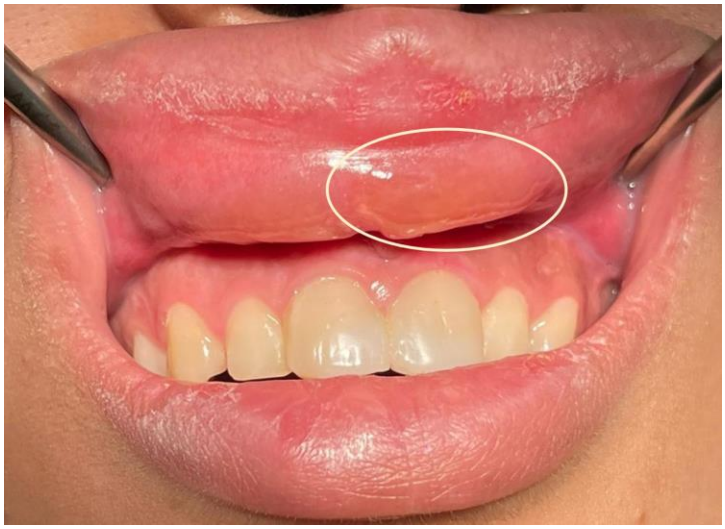

Figure 1. Intraoral photograph depicting a fluid-filled bulla located on the maxillary labial mucosa, indicative of an allergic reaction to local anesthetic (LA).

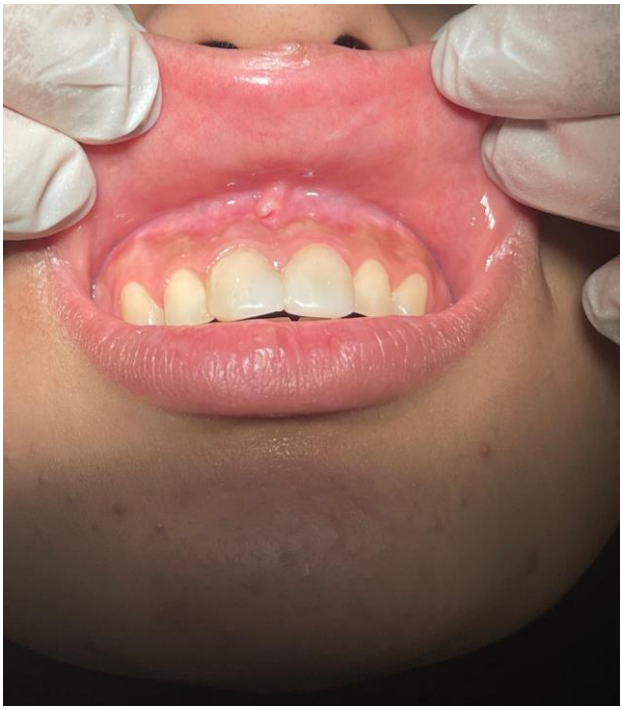

Figure 2. Photograph showing the resolution of symptoms after 7 days of treatment in a patient with an allergic reaction to local anesthetic (LA).

DISCUSSION

Healthcare professionals frequently encounter cases of hypersensitivity to LAs; however, these cases are rarely reported or documented, making it challenging to understand the underlying mechanisms of allergic responses to LAs. The literature indicates a higher incidence of allergic reactions to ester-type LAs compared to amide-type LAs.[3]

Symptoms of allergic reactions can range from mild responses, such as nausea, rashes, angioedema, and urticaria, to severe and potentially life-threatening conditions, including bronchospasm and cardiovascular or respiratory collapse.[3] In this case, the patient experienced discomfort a few hours after lidocaine administration, with swelling developing over the subsequent days. Fortunately, no severe reactions were observed.

For susceptible patients, careful clinical history-taking regarding allergies is crucial, and allergy tests are mandatory.[4,5] A reliable and commonly used initial method to evaluate hypersensitivity to LAs is skin prick testing.[6] If the skin prick test yields negative results, intradermal testing can be performed, starting with the lowest concentration of the potential allergen and gradually increasing it.[6] Another test considered the gold standard for confirming true IgE-mediated allergies is the subcutaneous challenge test.[3] Additionally, drug provocation tests can be performed for patients with a istory of allergies.[3] In this case, after thorough history-taking and intradermal testing, a diagnosis of hypersensitivity to lidocaine was confirmed. The patient was then referred to the Department of Dermatology, where she was found to be allergic to lidocaine, bupivacaine and mepivacaine.

Cross-sensitivity is observed with ester-type LAs; patients allergic to one ester-containing LA are often allergic to all others in the same class. In contrast, amide-type LAs do not exhibit cross-sensitivity.[7] In cases of systemic reactions to LAs, the primary management approach includes securing the airway, providing circulatory support, and minimizing systemic side effects. For severe systemic reactions, such as anaphylaxis, epinephrine is the first-line treatment followed by glucocorticoids and antihistamines.[7] It is important to acknowledge that this paper is based on a single patient case, which may limit the generalizability of the findings. Additionally, the follow-up period for the patient was relatively short. Multicenter studies are recommended to collect data on the prevalence and types of allergic reactions to LAs.

Allergic reactions, though rare, can occur with any type of LA agent. Patients with a positive history of allergies or adverse reactions to LAs should undergo a detailed history assessment to understand the events leading to the reaction. This assessment should guide the development of a personalized treatment plan. Furthermore, allergy testing must be performed to identify the true causative agent, ensuring an alternative LA is selected when necessary.

STATEMENT OF ETHICS

Ethical approval was exempted for this case report, which includes a literature review. Informed consent was obtained from the patient for this case report.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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Not applicable

DATA AVAILABILITY

The data set used in the current study will be made available on request from the corresponding author.

AI ASSISTANCE DISCLOSURE

No AI tool was used in the creation of this paper.

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