

Lidocaine Allergy: A Case Report on an Uncommon Complication with a Commonly Used Local Anesthetic

Abstract:

Profound local anesthesia(LA) is a prerequisite for the satisfactory treatment of a patient in a dental clinic. The most commonly used local anesthetics in dentistry is Lidocaine. Allergy to Lidocaine is a rare incidence and can vary in presentation. This article describes a case of a female patient seeking endodontic treatment, who reported angioedema soon after a local anesthetic injection containing Lidocaine. The presumptive diagnosis was a hypersensitivity reaction to Lidocaine, which was confirmed by a skin-prick and intra-dermal test. The patient was managed by a dosage of oral corticosteroids and antihistaminics, before ensuing further treatment. This article emphasizes the significance of allergy testing prior to LA use, taking into account the significant consequences of allergy to these agents.

Key-words: allergy, case report, corticosteroids, hypersensitivity, Lidocaine, local anesthetics

Introduction:

Allergy is a hypersensitive state, which occurs due to an exposure to a particular allergen, which produces a heightened reactivity. A wide range of clinical symptoms is associated with allergic reactions, from moderate, delayed reactions that happen up to 48 hours after contact with the allergen to instantaneous, life-threatening reactions that happen within seconds of exposure.[1] The usual symptoms are urticaria, erythema, and intense itching to more severe forms of angioedema and respiratory distress. The anaphylactic reaction includes life-threatening symptoms of apnoea, hypotension, and loss of consciousness.[2,3]

Dental surgeons rely on effective local anesthesia(LA)to ensure painless procedures. A painless procedure helps to achieve patient cooperation. The most common form of local anesthetic used in dentistry is Lidocaine, an amide-type LA. Although rare, allergic reactions to LA typically comprise two types of reactions: type I reactions mediated by immunoglobulin E (IgE) and type IV reactions mediated by T cells.

The following case report shares an incident of an adverse drug reaction to the LA agent Lidocaine.

Case Report:

A 30-year-old female patient reported to the Department of Conservative Dentistry and Endodontics of the Dental College and Hospital for endodontic management of the Maxillary Left Central Incisor. A detailed medical history including a previous history of allergy was taken and the patient did not mention any eventful episodes with any drug intake previously.

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Received : 20 April, 2025, **Published :** 30 Sept., 2025

Access this article online	
Website: www.ujds.in	Quick Response Code 
DOI: https://doi.org/10.21276/ujds.2025.v11.i3.14	

How to cite this article: Mandal, K., Mondal, P., Chatterjee, A., & Das, S. (2025). Lidocaine Allergy: A Case Report on an uncommon complication with a commonly used local anesthetic. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 11(3).

Following the standard operating procedure, the tooth was anesthetized using 1 ml of 2% lidocaine with 1:80000 Adrenaline in vial form after obtaining informed consent.

During biomechanical preparation, the development of angioedema was noticed in the lips of the patient (Fig.1). No systemic symptoms were noticeable, and vital signs were under normal limits. The reasons considered were either sodium hypochlorite accident, air emphysema, or angioedema. As the swelling was not accompanied by discoloration or pain, a provisional diagnosis of angioedema with a suspected allergy to LA was made.

The patient was observed for the next one hour for systemic signs or symptoms such as rash or respiratory distress. After an uneventful observatory period, she was released with instructions to contact emergency services in case any further symptoms developed. The patient was prescribed oral corticosteroids (Prednisolone 10 mg b.d.) and anti-histaminic (Fexofenadine 120 mg o.d.) for five days and was recalled for subsequent follow-ups on the next day and five days later.

The patient reported a remarkable resolution of symptoms on the next day of her follow-up visit (Fig.2) and a complete resolution after 5 days (Fig.3). She was also advised to visit the concerned department for an allergy test a week later. A skin-prick and intra-dermal test performed using the Hollister Steir grading system with lidocaine revealed a wheal and flare response. Additionally, allergy testing was carried out for analgesics and antibiotics as well, anticipating the prescription of the same during the treatment course or later.

Further endodontic treatment was completed in subsequent visits. A special note regarding the adverse drug event was mentioned in the medical history records of the patient. The patient and the family were also informed of the same. No eventful incidences were recorded until the last follow-up, that is nine months after the incident. Informed consent was obtained from the patient for the publication of their case details and accompanying images for research purposes.

Discussion:

Profound anesthesia enables a dentist to perform complicated and detailed procedures due to increased patient compliance.

However, like any other drug, the LA or its constituents of the solution may have an adverse drug reaction. In reality, the incidence of side effects from LA ranges from 0.1% to 1%,^[4] and allergic reactions to LA are extremely uncommon, occurring at a rate of less than 1%.^[5]

Allergic responses also can be due to preservatives or antioxidants in the injection solution besides the active drug.^[6]

There are two main categories of allergic reactions to local anesthetics: type I reactions mediated by IgE and type IV reactions mediated by T cells.^[7] IgE antibodies bind to antigens through mediators released by mast cells and basophils, such as histamine, causing a type I reaction. The symptoms of a type I reaction can take anywhere from one to four hours to manifest, but they usually do so in a matter of seconds to minutes. T cells that are exposed to the antigens produced by Langerhans cells mediate type IV reactions, and a subsequent exposure sets off a reaction. It usually takes a day or two for this to show up.^[8]

Angioedema is diffuse oedematous soft tissue swelling commonly involving the subcutaneous & sub-mucosal connective tissue. It manifests as soft, non-tender, diffuse oedematous swelling. It is caused by i) allergy to the drug, ii) specific drug-related allergic reaction to ACE inhibitor, iii) faulty hereditary form, iv) idiopathic.^[9]

Before beginning any procedure, a thorough medical history and prior dental history must be obtained. In case of an alleged allergy to local anesthetics, the response needs to be detailed with the description of the reaction, the resolution, and management as well as previous dental care provider should be contacted if needed.

An allergy test ought to be conducted if the patient's medical history is positive. Note that no allergy test has 100% reliability. Intracutaneous testing is more dependable for diagnosing allergies, even though the skin prick test is the most often used technique.^[8]

Dental professionals must be aware and alert regarding the varying signs and symptoms of allergy. The dental office must be equipped with management of acute onset of anaphylactic reaction. The dental office should post emergency phone numbers, call them as soon as the patient's symptoms start to subside, and keep an eye on them until they do.

Local anesthetics, for which the patient had tested negative in allergy testing, should be utilized in subsequent treatments; however, if this is not possible, general anesthesia should be explored. Injectable histamine blockers, such as Diphenhydramine hydrochloride in 1% solution with 1:100000 epinephrine and nitrous oxide sedation, may be explored if general anesthesia is unavailable. For a maximum of half an hour, it offers pulpal anesthesia. ^[10]

A potential limitation associated with the report includes the unavailability of an intra-dermal testing apparatus in the department, owing to which intra-dermal testing couldn't be carried out before injecting the local anesthetic.



Figure 1: Clinical view showing the development of angioedema following an administration of Lidocaine



Figure 2: Clinical view showing the condition of the patient after one day



Figure 3: Clinical view showing complete resolution of lip swelling after five days

Conclusion:

The best way to avoid accidents at the dentist's office is to be aware of and ready for adverse pharmacological responses to local anesthetics, even though they are uncommon. Proper knowledge of the drugs being administered, history-taking, availability of emergency medicines and equipment in the dental clinic, and having an established protocol for the management of such adverse drug reactions are of paramount importance.

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