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# Immediate reaction to lidocaine with periorbital edema during upper blepharoplasty

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## ABSTRACT

**INTRODUCTION:** Blepharoplasty is the fourth most commonly performed cosmetic surgery in the US, with 207,000 operations in 2014. Lidocaine is the preferred anesthetic agent for blepharoplasty.

**PRESENTATION OF CASE:** We describe the unusual case of acute periorbital edema following local anesthesia with lidocaine for upper blepharoplasty. At present, only two other reports of periorbital reactions to lidocaine are present in the literature. The reactions observed are significant palpebral swelling and erythema with scaling of the cheek. Fortunately the swelling, although marked, is transient in nature and resolves almost spontaneously without affecting the visual acuity.

**DISCUSSION:** Patients reporting adverse reactions should be screened for allergy according to the standard protocols, but skin testing has only been reported to be positive in less than 10% of all cases and allergy confirmation with IgE is even more rare.

**CONCLUSION:** In clinical practice, we recommend that patient should be informed about the possibility of recurrence of an adverse reaction in case of re-exposure to lidocaine, even in the vast majority of cases where true allergy could not be proven. In case of further need for local anesthesia with history of an adverse event, a different agent may be chosen even from the same class (another amide) as cross-reactions in the amide group are rare. Otherwise, an anesthetic from the ester group can also be safely used.

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## 1. Introduction

Blepharoplasty is the fourth most commonly performed cosmetic surgery in the US, with 207,000 operations in 2014 [1]. Local anesthesia is desirable regardless of the surgical setting for intraoperative and postoperative pain control, and the combination with epinephrine reduces bleeding. The administration should be performed with caution and as carefully as the surgical procedure. We describe the unusual case of acute periorbital edema following local anesthesia with lidocaine for upper blepharoplasty.

## 2. Presentation of case

A 79-year-old male was scheduled to undergo a cosmetic bilateral upper blepharoplasty (Fig. 1). Daily medicine included simvastatin 20 mg qd. No history of allergy was reported. Past ocular history was silent. Best-corrected visual acuity was 6/20 OD and 13/20 OS. Before entering the operating room, blood pressure

was 130/85 mmHg. No preoperative ocular lubricants or protective contact shields were placed on the eyes.

The upper lids were infiltrated along the incision line with local anesthetic 2% lidocaine with 1:100,000 epinephrine (2.5 cc each lid) with no hyaluronidase in the mixture. Approximately 3 min after, a marked swelling and redness occurred to the periorbital area bilaterally. Not only did the upper eyelid swell but a clear swelling of the lower eyelid could be seen, associated with redness of the cheeks and nose (Fig. 2). No tongue, lips, or mouth involvement was observed and he did not report any itching. Immediate examination did not reveal alteration in his visual acuity or light perception. He was given immediate therapy of i.v. dexamethasone 4 mg, 20% mannitol 100 ml, and topical pilocarpine 2%, and constant pressure was exerted to the globes. The swelling regressed within 30 min. Local anesthesia to the upper lids was achieved and surgery was performed uneventfully. The patient was hospitalized and treated with paracetamol 1 g/8 h, ceftriaxone 1000 mg/12 h, pantoprazole 40 mg/12 h, dexamethasone 2 mg/24 h, acetazolamide 1 g/8 h, and ice packs to the globes. On the following day, the swelling and redness had regressed completely. Visual acuity was intact and intraocular pressure was within normal references. The patient was discharged and referred for allergologic investigations. Prick and intracutaneous tests with the causative agent and

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Fig. 1. Skin marking for upper eyelid blepharoplasty, prior to administration of local anesthesia.



Fig. 2. Acute bilateral periorbital edema, after administration of local anesthesia. Anesthesia was administered to the upper eyelids only.

preservatives proved negative. Results of prick tests with natural latex were also negative. Challenge with the causative agent provoked a reaction of erythema at the test site shortly after exposure to lidocaine which resolved spontaneously within 2 h. Challenge with preservatives did not show any objective symptoms. Serum test for specific IgE was negative. Despite the fact that it was not possible to document a true allergy, the patient was counselled to avoid exposure to lidocaine in the future.

3. Discussion

Lidocaine is the preferred anesthetic agent for blepharoplasty due to rapid onset of its action (1.5 min), intermediate duration of efficacy (1.5–2 h) and good toleration. In general, there is little apprehension for toxic effects with local periocular anesthesia but reactions are concerning once they occur, especially because oculoplastic surgery is often performed in an office setting. The time of onset is unpredictable and manifestations are not limited to the injection site but can extend to all of the peribulbar areas and cheek.

Two other reports of periorbital reactions to lidocaine are present in the literature. One patient received lidocaine on three different occasions, twice as subconjunctival administration and the third as local anesthesia for lateral tarsorrhaphy. On all occasions, the reactions observed were significant palpebral swelling and erythema with scaling of the cheek [2]. The other patient developed acute orbital swelling after a peribulbar anesthetic injection, and eight months later local anesthesia with lidocaine for trabeculectomy caused edema and marked swelling of the lid and cheek [3]. Both cases reported reactions following several hours, while our case is the first description of an immediate event manifesting within minutes from anesthesia. Fortunately all the reports including ours confirm that the swelling, although marked, is transient

in nature and resolves almost spontaneously without affecting the visual acuity.

Patients reporting adverse reactions should be screened for allergy according to the standard protocols. Prick-testing followed by intracutaneous test and finally a challenge test is the standard procedure to begin with (Table 1). Prick and intracutaneous testing should be carried out with the suspected drug. Reactions to latex should also be excluded. Serologic tests for specific IgE might be added. However, skin testing has been reported positive in less than 10% of patients challenged. Positive results are no more frequent in those with history most compatible with allergy and allergy confirmation. Further, allergy confirmation with IgE is even more rare than skin testing [4]. Even an immediate reaction like our case could not find confirmation with specific IgE antibodies targeting lidocaine. It can be presumed that the major mechanism underlying the response is a direct release of histamine induced by lidocaine. Delayed swelling which develops within 2–24 h should be tested with patch-test to rule out delayed-type (IV) allergy. However, false-negative tests are possible and related to failure of the patch-test procedure to reproduce the conditions for appearance of the reaction [4].

Additives in local anesthetic solutions such as antioxidants or preservatives (metabisulphite or parabens) may also be responsible for adverse reactions, and specific tests might be an option (Table 1). Also the presence of hyaluronidase in the local anesthetic mixture might play a part in orbital swelling [3] and dose should never exceed 15 U/ml.

Lastly, the technique of administration of anesthesia should be cautious. On close scrutiny of our case, more than the recommended dose of local anesthetic with epinephrine was used. It is advisable that no more than 1 ml be injected because of the thin and delicate nature of the upper eyelid [5].

4. Conclusion

In clinical practice, patient should be informed about the possibility of recurrence of an adverse reaction in case of re-exposure to lidocaine, even in case a true allergy could not be proven. In case of further need for local anesthesia with history of an adverse event, a different agent may be chosen even from the same class (another amide) (Table 2), as cross-reactions in the amide group are rare [4].

Table 1 Diagnostic schedule for allergy testing.

Test	Substances
1. Prick test	Local anesthetic agent Preservatives Latex
2. Intracutaneous test	Local anesthetic agent
3. Challenge test	Local anesthetic agent Preservatives Latex
4. Patch test	Local anesthetic agent Preservatives Latex
5. Radioallergosorbent test (RAST)/fluorescence enzyme-labeled assay	Specific IgE antibodies to allergens

Table 2 Classes of local anesthetics.

Amides	Esters
Lidocaine hydrochloride	Procaine hydrochloride
Bupivacaine hydrochloride	Cocaine hydrochloride
Mepivacaine	Benzocaine
Etidocaine hydrochloride	Benoxinate hydrochloride
Prilocaine hydrochloride	Tetracaine hydrochloride

Otherwise, an anesthetic from the ester group can also be safely used.

#### Consent

The authors declare that appropriate informed written consent for the use of personal details and images was obtained from the patient.

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#### Ethical approval

The present study is not a research study.

#### Author contribution

Dr. Presman contributed to the present work by analysing and interpreting the data, drafting the article, and finally approving the version to be submitted.

Dr. Vindigni contributed to the conception and design of the Report, he revised critically the article content, and gave final approval of the version to be submitted.

Dr. Tocco-Tussardi acquired the clinical data, helped drafting the article, revised critically the content, and gave final approval of the version to be submitted.

#### Guarantor

Dr. Tocco-Tussardi is the Guarantor for the present study.

#### Conflict of interest

The authors have no financial interest to declare or anything to disclose in relation to the content of this article.

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