



Transient unilateral exotropia after an infraorbital local anesthetic injection: a case report

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We report a case of transient unilateral exotropia, a rare complication that occurred after an infraorbital local anesthetic injection, and present the possible mechanism underlying this adverse effect. A 64-year-old man underwent an excisional biopsy under local anesthesia for bilateral lower eyelid masses. He received a subcutaneous injection of a local anesthetic (a combination of 1:100,000 epinephrine and 2% lidocaine). Intraoperatively, we observed a homogeneous, fat-attenuated mass with thin fibrous septae inside the orbital septum of each eye. Following excision of the masses, the patient developed severe diplopia accompanied by exotropia, impaired adduction, and mydriasis of the right eye. The pupillary light reflex, visual acuity, and visual field test results were within normal ranges. Notably, his symptoms completely resolved 4 hours postoperatively without intervention. To our knowledge, transient unilateral exotropia following infraorbital local anesthetic injection is rare. The exotropia was attributed to diffusion of the epinephrine/lidocaine solution, which may have affected the ciliary ganglion and the medial rectus muscle. Caution is warranted during local anesthetic injections in patients who undergo periorbital surgery.

Keywords Local anesthesia / Oculoplastic / Strabismus / Exotropia / Case reports

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INTRODUCTION

Local anesthesia induces reversible loss of sensation and muscle contraction and thereby reduces pain perception in limited areas of the body [1]. Most periocular procedures, such as blepharoplasty or biopsy, can be performed under local anesthesia, with injection of the local anesthetic directly into the periocular area [2].

Direct injection of an anesthetic into the extraocular muscles (EOMs) can cause postoperative strabismus, although the probability of this complication is low. Postoperative strabismus can also result from nerve and needle injuries to the EOM. This complica-

tion is usually temporary, but may be permanent in some patients [3].

We present a rare case of transient exotropia (a form of strabismus characterized by outward deviation of the affected eye) after lower eyelid surgery under local anesthesia that resolved spontaneously without intervention.

CASE REPORT

A 64-year-old man presented with palpable masses on both lower eyelids (Fig. 1). We performed surgery under local anesthesia after injection of an epinephrine-lidocaine solution (1:100,000) into the subcutaneous layer of the lower eyelid lesions per standard procedure. Intraoperatively, we identified fat-attenuated lipomatous masses with thin fibrous septae inside the orbital septum, adjacent to the medial fat pad; the masses were later confirmed as lipomas on biopsy (Fig. 2). Before removing the masses, we injected additional local anesthetic superficially inside the capsule of each mass. The masses were completely removed without injury to adjacent structures. However, the patient developed significant diplopia, exotropia, and mydriasis of the right eye immediately postoperatively

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Fig. 1. Preoperative photograph of the patient showing a normal gaze. Both lower eyelid masses are visible.



Fig. 2. Intraoperative findings showing a lipomatous mass adjacent to the medial fat pad on the right lower eyelid. Complete excision was performed under local anesthesia without any injury to adjacent structures.



Fig. 3. Photographs showing immediate postoperative findings. Eye gaze in the [A] left, [B] direct, [C] right. An outward turning of the right eye (exotropia) with severe diplopia is observed.



Fig. 4. Photographs at 4 hours postoperatively. Eye gaze in the [A] left, [B] direct, [C] right. Exotropia and diplopia are completely resolved without intervention or medication. The patient remained asymptomatic without sequelae during clinical follow-up.

(Fig. 3). The left eye showed no abnormalities. The pupillary light reflex, visual acuity, and visual field test were all within normal ranges, and no other neurological findings were observed on physical examination. The diplopia and exotropia showed complete resolution 4 hours postoperatively. The patient was discharged the day after surgery and underwent outpatient follow-up. He remained

asymptomatic without any sequelae (Fig. 4).

DISCUSSION

Strabismus is a condition in which the eyes do not properly align with each other when looking at an object. This ocular disorder is

categorized into the following types based on the direction of the turned (misaligned) eye: esotropia (inward turning), exotropia (outward turning), hypertropia (upward turning), and hypotropia (downward turning). Strabismus may occur secondary to palsies of the cranial nerves that innervate the EOMs or after direct trauma-induced muscular injury [4,5]. In recent years, most periocular procedures, including blepharoplasty, eyebrow lift, laser eye surgery, and biopsy, have been performed under local anesthesia.

Few studies have reported strabismus following a local anesthetic injection. Local anesthetics injected into the lower eyelid fat pad can affect the adjacent orbital structures. Diffusion of anesthetics into the EOM, optic nerve, and ciliary ganglion can result in transient or permanent strabismus, pupillary changes, and visual loss. Most permanent complications are attributable to anesthetic-induced ischemia of the optic nerve and EOM [6].

Two previous reports described vertical diplopia caused by retrobulbar injection-induced strabismus during cataract surgery. Overactivity or underactivity of the inferior rectus muscle was implicated as a contributor, and this effect disappeared after surgery on the muscle [7]. Other underlying mechanisms may include direct injury to the nerves that innervate the EOMs secondary to suture placement and needle-induced trauma, anesthetic myotoxicity, or muscle ischemia due to increased tissue pressure induced by hematoma. Using computed tomography or magnetic resonance imaging, two studies revealed muscle enlargement in patients with EOM “contracture syndrome” [8,9]. These complications occurred after a retrobulbar injection was administered prior to cataract surgery, whereas our patient developed exotropia after receiving a superficial injection. Furthermore, our patient recovered spontaneously and completely without further surgical intervention.

Amide-type agents are the most common local anesthetics used in clinical practice. Among these, lidocaine hydrochloride (1%–2%) is the most frequently used drug because of its short onset of action (within 1 minute), long duration of action (1–3 hours), and low risk of toxicity. The addition of epinephrine (which serves as a vasoconstrictor) to lidocaine (1:100,000 or 1:200,000) prolongs the duration of action of the anesthetic. Lidocaine alone at a dose of 3–4 mg/kg and lidocaine with epinephrine at a dose of 7 mg/kg are considered safe [10].

Our patient received a superficial local anesthetic injection into the middle fat pad of the lower eyelid. The inferior oblique muscle was identified and preserved. Immediately postoperatively, the patient showed right eye exotropia (outward deviation of the eye). Although we could not exclude stroke, the patient did not show any additional neurological symptoms such as aphasia, dizziness, or poor coordination.

The patient’s exotropia spontaneously resolved without treatment 4 hours postoperatively, which corresponded to the duration of action for the local anesthetic. Although further evaluation was not performed, it is reasonable to conclude that the exotropia and

diplopia occurred secondary to diffusion of the local anesthetic into the medial and inferior rectus muscles, with consequent limitations in the medial and inferior gaze.

Local anesthetic injections are commonly used during plastic surgery. Although the procedure is usually safe, cautious administration of local anesthetics is important during lower eyelid surgery to avoid complications, including diplopia and strabismus, which may occur in some patients. Accidental injury to adjacent structures must be avoided, and plastic surgeons should be aware that such adverse effects are possible. Although complications are usually reversible, the development of ocular complications such as strabismus and diplopia are invariably a frightening and unpleasant experience for both the surgeon and the patient. Therefore, clinicians should be mindful of the risk.

NOTES

Conflict of interest

No potential conflict of interest relevant to this article was reported.

Ethical approval

The study was approved by the Institutional Review Board of Soonchunhyang University Hospital (IRB No. 2022-03-015).

Patient consent

The patient provided written informed consent for publication of the case and use of his images.

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