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RESEARCH ARTICLE

LATERAL RECTUS PALSY AFTER POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

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Abstract

Ocular complications with the administration of local anesthetic are not completely unheard of but extremely rare. Such complications include diplopia, ptosis, temporary paralysis, amaurosis and even permanent blindness. Ophthalmologic complications have been reported with block anesthesia of mainly the inferior alveolar nerve and posterior superior alveolar nerve. Here we present a case of temporary paralysis of the lateral rectus muscle after the administration of a posterior superior alveolar nerve block.

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Introduction:-

Although ophthalmic complications following routine maxillary molar extractions are very rare, when they occur they can be extremely unnerving not just to the patient but also to the surgeon. ¹The first ophthalmologic complication in conjunction with a dental anesthesia was reported in 1936. ²Since then, many ocular complications following the administration of local anesthesia had been reported such as diplopia, amaurosis, ptosis, mydriasis, miosis, enophthalmos, strabismus, permanent blindness, facial nerve paralysis and temporary paralysis of cranial nerve III IV & VI. ³Here we present a case of transient diplopia and paralysis of lateral rectus muscle following administration of local anesthesia for the extraction of an upper molar tooth.

CASE REPORT.

A 45 year old female patient reported to the dental OP with a complaint of decay in the upper right back tooth. On examination, there was a gross decay on the upper right second molar tooth for which extraction was advised. With the patient's consent, local anesthetic 2 % lidocaine with 1: 80,000 adrenaline was administered with aspiration technique - Posterior Superior alveolar nerve block along with Greater Palatine nerve block.

A few minutes later, the patient complained of blurring of the right eye. Ocular examination revealed normal pupillary reflex with proper visual acuity. The patient had full extra ocular movements in all directions except that the right eye could not be abducted past the midline causing double vision (Fig. 1). There was no evidence of ptosis, proptosis, conjunctivitis or epiphora. The patient was reassured and sent to the ophthalmology OP for management.

There, after examination it was diagnosed to be a transient palsy of the lateral rectus muscle- rare, yet a complication of local anesthesia. In less than an hour, the condition reversed and the patient's ocular movement was back to normal, though the patient was in a state of panic.

She experienced palpitations and tachycardia. So dental procedure were deferred. In view of her continuing panic attacks she was sent to emergency medicine where an ECG proved to be normal. The patient experienced anxiety and lack of coordination for the entire day. The patient was discharged home later in the day.



Fig.1

(Patient attempting right lateral gaze. The right eye could not be abducted past the midline)

DISCUSSION:

Ocular complications with the administration of local anesthesia are rare but not completely unheard of. The most commonly reported ophthalmic complication of local anesthesia was diplopia (39.8%), mostly resulting from paralysis of the lateral rectus muscle. Other relatively frequent complications included ptosis (16.7%), mydriasis (14.8%) and amaurosis (13%). Ophthalmologic complications were mainly associated with block anesthesia of the inferior alveolar nerve (45.8%) or the posterior superior alveolar nerve (40.3%).²

Panarrocha et al⁷ proposed a theory that ophthalmic disorders are caused by direct diffusion of the anesthetic solution from pterygomaxillary fossa through the sphenomaxillary cavity to the orbit which could affect the ciliary ganglion located between optic nerve and external rectus muscle of eye. Lignocaine action around ciliary ganglion may explain the different manifestations in terms of either sympathetic or parasympathetic involvement.

Crean et al.⁸ observed peripheral fifth and sixth cranial nerve palsy in their patient who complained of double vision. They hypothesized that deposition of anesthetic solution within the PSA artery causes a back flow into the connecting maxillary artery and subsequently into middle meningeal artery. There exist several anastomoses between orbital branch of the middle meningeal artery and recurrent meningeal division of the lacrimal artery. Lacrimal artery supplies the lateral rectus muscle, lacrimal gland and outer half of eyelids.⁵

Chun-keilee⁹ hypothesized that intra-arterial injection of the local anesthesia can reach the cavernous sinus through arteries and cause paralysis of third, fourth and sixth cranial nerves. Goldenberg¹⁰ in his study further expanded that a local anesthetic could pass through the cavernous sinus towards the ophthalmic vein, ultimately reaching the ophthalmic artery by way of a series of anastomoses. The three cranial nerves (III, IV, and VI) are closely related to the cavernous sinus and the solution could have a direct anaesthetic effect on these nerves.

According to Chun-kei lee and Goldenberg, the recumbent position of the patient during anaesthetic delivery may have also played a role. This position could have aided in diffusion of the local anesthetic solution through the bony as well as the vascular channels.

These anatomical considerations can explain all documented ophthalmic complications following administration of local anesthesia through the posterior superior alveolar nerve block technique.¹

We propose in the present scenario the possible entry of the local anesthetic solution by diffusion into the orbital cavity as a result of an anatomically variant inferior orbital fissure and/or a more superiorly directed needle during the PSA block.

Conclusion:

Most ocular complications are temporary and usually resolve on their own once the local anaesthetic has worn off. Patient reassurance is of utmost importance in such situations to prevent panic as can be seen in this particular case.

The following management guidelines can be helpful to avoid further complications⁴:

- a) The reassurance of the patient is of utmost importance. They have to be convinced as to the transient nature of these complications.
- b) The affected eye has to be covered with an eye patch to protect the cornea for the duration of anaesthesia.
- c) Functional monocular vision will be restored by covering the affected eye. The patient should be escorted by a responsible adult, since monocular vision is devoid of distance-judging capability.
- d) If the ocular complications last longer than 6 hrs, refer patients to an ophthalmologist for re-evaluation.

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