

A Case of Transient Diplopia and Ophthalmoplegia Following Dental Anesthesia



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Abstract

Dental anesthesia is one of the most frequently performed medical procedures. Although the frequency of ocular complications is extremely low, these reactions can be highly alarming and may bring up medicolegal issues when they do occur. Dentists and oral surgeons should be well-informed of these adverse reactions and should be aware that both ophthalmologists and emergency physicians might be required to care for these patients.

Keywords: Diplopia; Ocular complications; Intraoral anesthesia

Introduction

The number of local anesthesia carried out by dentists is enormous and is considered to be an extremely safe procedure [1]. Ocular complications are unusually rare but can be alarming [2]. Most of the cases remain unreported and/or undocumented and some mild forms may not even be diagnosed [3]. Most ocular complications occur after a posterior superior or an inferior alveolar nerve block.

Case Report

A 26-year-old woman was scheduled for the surgical removal of her left-sided wisdom teeth under local anesthesia. She had undergone an uneventful removal of the right-sided wisdom teeth six weeks before. Her medical history was unremarkable.

A conventional posterior-superior alveolar nerve block was administered with 1.5ml articaine hydrochloride (40mg/ml plus

adrenaline 0.01mg/ml) injected into the mucobuccal fold above the third molar. Greater palatine nerve block was performed with 0.2ml of the same anesthetic. Inferior dental nerve block (1.5ml) combined with buccal nerve infiltration (0.2ml) were also given. Aspiration for blood was negative in all cases.

Approximately 5 minutes following the local anesthetic's administration the patient reported double vision. Otherwise she remained calm, alert and conscious and she had no other complaints. The pupils were equal and reactive. Limitations of eye movements were confined to abduction of the ipsilateral eye (Figure 1 & 2). There was no evidence of ptosis or proptosis. Blanching of the facial skin or color change was not noted. The anesthesia was effective in both the upper and lower teeth and surrounding tissues. Vital signs were found to be normal.



Figure 1: Left gaze in the patient.



Figure 2: Left and upper gaze in the patient.

The patient was assured that this complication was extremely rare and that her symptoms would resolve spontaneously. Treatment options were discussed, and a decision was made to proceed with the removal of the teeth. These were performed without further complications. The patient's diplopia improved slightly by the end of surgery, but she was kept under continuous observation. Approximately two hours after the onset of her symptoms the double vision nearly fully resolved. She was escorted home by a friend and was advised against driving until her visual function returned to normal. A further two hours later she reported on the phone that the diplopia had resolved completely.

Discussion

Local anesthetics can paralyze the extraocular muscles directly or through the nervous system. Impairment of the oculomotor (III), trochlear (IV) or abducens (VI) nerves results in different restriction of the eye movements. The pathomechanism of how anesthetic agents impair ocular functions is not clearly understood. The most commonly cited theories are the following:

- A. The area where the anesthetic is administered is highly vascularized and unintentional intravascular injections can easily occur. Inadvertent injection into an artery with an intracranial course that anastomose with the vessels supplying the extraocular muscles may result in limited eye movements.
- B. Local anesthetic injected into the venous circulation can enter the cavernous sinus via the pterygoid plexus and thus anaesthetize the III, IV or VI nerves.
- C. Vascular wall trauma of an alveolar artery caused by an injection needle may activate sympathetic fibers, resulting in vasospasm of the vessels supplying the orbital muscles.
- D. The anesthetic drug may spread directly from the pterygopalatine fossa into the orbit through the inferior orbital fissure following superior alveolar nerve blocks.

The number of documented ophthalmologic complications after intraoral anesthesia has been extremely low, approximately one per year, since it was reported first in the literature [4]. Diplopia is the most common one [5]. The intracranial course of the abducens nerve is long and is vulnerable at many sites, therefore, the lateral rectus is the most frequently affected muscle [6]. Females are affected more frequently than males, one of the possible explanations is that although the female facial skeleton is generally smaller and thinner, both genders receive the same dose of local anesthetic. Most patients are in their third or fourth decade of life; this may be explained by the fact, that most wisdom teeth are removed in this age group. Lidocaine and articaine are the most often involved local anesthetics. As articaine is gaining more popularity as it has excellent diffusion properties, so the number of ocular complications may rise. In nearly all reported cases aspiration for blood was stated negative.

Ocular complications may develop after maxillary and mandibular blocks. The patient in our case report received both, therefore it cannot be decided which one of them resulted in diplopia. Although there are a few severe and permanent ocular complications reported in the literature, in most cases it is of temporary nature. Double vision usually disappears within 2 hours after the onset. Occasionally, recovery may take up to 4-5 hours and very rarely up to 24 hours.

However, the psychological aspect of the disease must be taken seriously. Patients would never expect to have eye problems during treatment in a dental surgery and these symptoms can be really alarming. Acute onset of diplopia should be addressed properly since it can be a sign of stroke or intracranial hemorrhage. The most important step is to assess the patient's vital signs (pulse rate, respiratory rate, blood pressure, temperature and level of consciousness). Other alarming signs-acute headache, nausea, vomiting, cranial nerve palsy, unequal pupils-should be treated as an emergency; the dental procedure should be interrupted

immediately, and emergency services should be called, and the patient should be laid flat with vital signs monitored and documented. Reassurance of the patient is of major importance.

If vital signs are normal and the patient is agreeable, there is no reason to postpone the planned procedure, but postoperative monitoring is necessary until diplopia completely resolves. Our case demonstrates that with appropriate management and follow-up, such a case can be brought to successful dental and ophthalmic solution.

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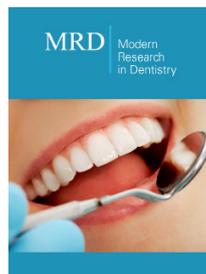
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