

OCULAR COMPLICATIONS WITH ODONTOGENIC ORIGIN

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Abstract

Background: Due to the proximity of the oral cavity with the orbit ocular complications with odontogenic origin must be considered.

Aims and tasks: To make a review of ocular complications with odontogenic origin described in the literature

Methods and materials: literature review; free search, Pubmed, Embase

Results: Dental procedures like tooth extraction and injection of anesthetic solution can cause ocular complications like diplopia, strabismus, ptosis, amaurosis fugax, blurring of vision, mydriasis, enophthalmos. Complications are not usually serious and transient but the practitioner must be alarmed for the most devastating like permanent blindness. Orbital cellulitis and abscesses originating from dental procedures and dental infection are also described in the literature.

Conclusion: Ocular complications from dental procedures and infections are rare but must be well known by the practitioners in order to provide better care for the patients.

Key words: *dental procedures, dental infection, ocular complications*

Background: The upper jaw forms the floor of the maxillary sinus and the upper teeth are continuous with the whole midface and cranium, therefore while treating these teeth, it is important for the practitioner to consider the possibility of ocular complications /17/. Dental procedures rarely induce ophthalmic complications including diplopia, strabismus, ptosis, and amaurosis fugax /27/. Injection of anesthetic solution into the oral cavity is the leading factor in the development of these complications. Tooth extraction is also charged for ocular complications. Some of them are transient but more catastrophic complications like permanent amaurosis, orbital cellulitis, orbital abscess, and endophthalmitis are also reported in the literature / 20/.

Aims and tasks: To make a review of ocular complications with odontogenic origin described in the literature

Methods and materials: literature review; free search, Pubmed, Embase

Results: Complications of dental origin which are most often described in the literature are from local anesthetics, tooth extraction and tooth infection. Single cases of ocular complications

like intraocular hemorrhage associated dental implant surgery /13/ and retinal tear after teeth cleaning /9/ are also described in the literature.

Complications after using intraoral anesthetics are most often described. Local anesthetics are safe and effective drugs but do have risks that practitioners need to be aware of. Understanding the risks involved with local anesthesia decreases the chances of adverse events occurring and ultimately leads to improved patient care /5/. The most commonly anesthetized nerves in dentistry are branches or nerve trunks associated with the maxillary and mandibular divisions of the trigeminal nerve (cranial nerve V). However, other nerves may be inadvertently affected by intraoral local anesthesia injections, resulting in anesthetic complications of structures far from the oral cavity. These complications include oculomotor paralysis and vision loss. The knowledge of these conditions and their potential cause should alert the dentist to the importance of appropriate injection techniques and an understanding of management protocol /2/.

According to a review on the topic the mean age of the patients with such complications is 33.8 years and females predominated (72.3%). The most commonly reported complication is diplopia (39.8%), mostly resulting from paralysis of the lateral rectus muscle. Other relatively frequent complications include ptosis (16.7%), mydriasis (14.8%) and amaurosis (13%). Ophthalmologic complications are mainly associated with block anesthesia of the inferior alveolar nerve (45.8%) or the posterior superior alveolar nerve (40.3%). Typically, the ophthalmologic complications in conjunction with intraoral local anesthesia have an immediate to short onset, and disappear as the anesthesia subsides /26/.

Some other more rare complications described in the literature are transient loss of power of accommodation /18/, blanching of the skin /1/, involuntary fasciculation or hemifacial spasm and eventual eyelid closure on the contralateral side /10/. Horner-like manifestations involving ptosis, enophthalmos, and miosis of the eye have also been reported /3,8/.

The pathologic of some of the complications are still not very clear. For example, various causes for transient isolated amaurosis have been proposed like intravascular injection, sympathetic impulse generation, and embolism /24/. The possible explanation for transient loss of power of accommodation is accidental injection into the neurovascular bundle of local anesthetic agents, which were carried via the blood to the orbital region. This resulted in paralysis of a branch of cranial nerve III, the short ciliary nerves that innervate the ciliary muscle, which controls accommodation /18/.

Some serious complications after tooth extraction can also be met by the clinician. They are mainly related to using local anesthetics as explained before. But sometimes the exact pathologic mechanism can be obscure. A case of a 51-year-old woman with retinal arterial occlusion after tooth extraction is described as a rare but serious cause of permanent visual loss among dental procedures /19/. Retinal detachment and vitreous hemorrhage following dental extraction is described by Kinderman and Tair in 2013 /12/. A 14-year-old boy suffered transient uniocular blindness after extraction of four permanent first molar teeth under general anaesthetic. The authors discuss the theoretical basis for ocular vasospasm secondary to the minor trauma of dental extraction being relayed to the orbit /16/.

Infections of the orbit like cellulitis and abscesses secondary to dental procedures and dental infection are also described. There are two case reports of orbital infections secondary to tooth extraction. The first one is a 21-year-old patient with orbital abscess and vision loss left after wisdom-tooth extraction /21/ and the other one an orbital apex syndrome after tooth extraction in an immunocompromised patient. Urgent MRI brain and orbit revealed severe left paranasal sinusitis

with anterior displacement of the left globe and presence of orbital abscess /22/.

Cases of orbital infection are described also after endodontic treatment /7/ and porous polyethylene implant insertion /11/.

The most often cause of orbital infection with odontogenic origin is dental infection /15, 23, 25/. Spread of infection may be direct extension by way of fascial spaces, hematogenously, or along lymphatics /4/. Review of 23 patients with odontogenic orbital cellulitis from the scientific literature demonstrated periapical lucency as the most commonly (36.4%) reported finding on facial and orbital computerized tomography (CT) scan. Orbital abscess occurred in 72.7% of cases, and tooth extraction and/or abscess drainage was required in 95.5% of cases reviewed for control of infection. Periapical lucency on CT can help identify this atypical origin of cellulitis that is strongly associated with abscess formation and need for surgical intervention /6/.

Conclusion: Ocular complications from dental procedures and infections are rare but must be well known by the practitioners in order to provide better care for the patients. Understanding the risks involved with dental procedures and the possible connection of dental infection with the orbit decreases the chances of unfortunate events.

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