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Case Report

ORBITAL CELLULITIS SECONDARY TO ODONTOGENIC INFECTION

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ABSTRACT

Orbital cellulitis is the infection of the intraorbital tissues located posterior to orbital septum. It is recognized as an ophthalmology emergency that is vision threatening which requires urgent attention. Orbital cellulitis caused by odontogenic infection is rare, comprising only 2% - 5% of all cases. We report a case of orbital cellulitis secondary to odontogenic infection. In addition to antibiotic treatment, lateral canthotomy and cantholysis procedure has salvaged the function of optic nerve.

INTRODUCTION

Infectious orbital cellulitis generally occurs by direct inoculation as a result of trauma or surgery, hematogenous spread in the setting of bacteremia, or extension from adjacent paranasal sinuses, ocular and adnexal structures .Very rarely, odontogenic infection may cause orbital cellulitis [1]. Common causative organisms includes *Streptococcus spp, Staphylococcus spp* and *Moraxella catarrhalis* [2]. Pseudomonas aeruginosa and fungal organisms (invasive aspergillosis or mucormycosis) occur more commonly in immunocompromised individuals. Orbital cellulitis is managed medically or surgically. Life threatening complications from intracranial extension via orbital roof or apex include cavernous sinus thrombosis, meningitis, encephalitis and frontal lobe abscess.

CASE REPORT

A 41 year-old man presented with 3 days history of left painful proptosis associated with swelling and diplopia. These symptoms were preceded by left sided upper molar pain, associated with left-sided facial and neck swelling; which was treated with oral antibiotics.

Left best corrected visual acuity(BCVA) at presentation was only counting finger. Right BCVA was 6/6. There was left relative afferent papillary defect (RAPD). Significant findings were confined to the left eye, which includes proptosis with mechanical ptosis, restriction of extraocular movement in all direction of gaze, conjunctival chemosis and elevated intra-ocular pressure (IOP) of 50mmHg (Figure 1: A,B,C). Funduscopy revealed hyperemic optic disc. The left sided periorbital and facial swelling extended towards the submandibular area. Contrast enhanced computed tomography (CECT) of face and neck revealed irregular hypodensities within the enlarged left masseter muscle measuring 8.0 x 3.5 x 7.9 cm. There were inflamed soft tissues in the lateral left extraconal space extending into the left inferior orbital fissure (Figure 2A).

Patient was treated as left orbital cellulitis with facial abscess secondary to odontogenic origin. Intravenous (IV) antibiotics was empirically initiated along with IOP lowering agents. Following this, incision and drainage of the left facial abscess was performed on the day of admission by dental team. About 100 ml of pus was drained.

Despite of commencement of IV antibiotics and drainage of abscess, the left eye deteriorated as evidenced by frozen eye, worsening of proptosis and no improvement in optic nerve function. Antibiotic was escalated to IV ceftriaxone as it showed sensitivity towards culture (*Streptococcus sp*).

As his condition was not improving, CT imaging was repeated on day 5 which revealed a larger abscess

along left temporalis and masseter muscles. There was left orbital extension, hypodense extraconal collection at the lateral, superior and inferior aspect of the orbit with possible involvement of the respective recti muscles (Figure 2B). Clinically, patient showed signs of impending orbital compartment syndrome.

Patient underwent re-exploration, incision and drainage of left facial abscesses with left lateral canthotomy and inferior cantholysis. This combined surgery was a joint effort by the dental and ophthalmology team. Intraoperatively, 100 cc of pus mixed with blood was drained from left infratemporal , buccal and sub-masseter space.

Patient showed marked improvement within 24 hours following second drainage. Left vision improved to 6/18, IOP normalized and the extra-ocular movements improved of about 50%. Following a course of 2-weeks antibiotics visual acuity improved to 6/6, no more RAPD was observed. The extraocular movements improved significantly with minimal residual restriction in upgaze and down gaze.

Figure 1: A : Left proptosis associated with swelling of the left side of the face. B: The globe is proptosed inferiorly associated with complete mechanical ptosis. C: Left conjunjuntival chemosis.

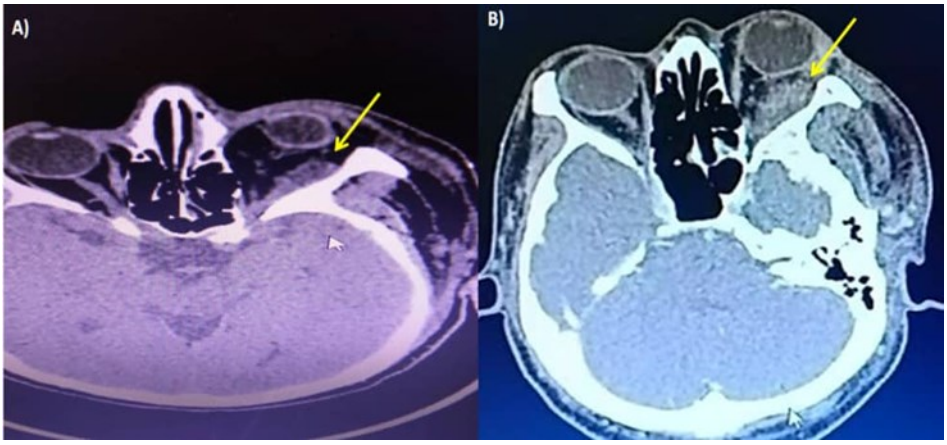

Figure 2: A. MRI shows extraconal enhanced soft tissue mass (white arrow) B. Repeat MRI 5 days later shows more extraconal enhanced tissue mass causing obvious proptosis (white arrow)

Figure 3: Anterior segment photograph on completion of antibiotic course shows complete resolution of left proptosis and swelling of the face.

DISCUSSION

There are several routes of spread of an odontogenic infection to the orbit. The most common route is the infection of a molar or premolar tooth invading the maxillary sinus, spreading into the orbit through bone erosion between the orbit and the maxillary sinus, or through the ethmoid sinus or infraorbital canals [3, 4].

Odontogenic infection can spread directly to the orbit by extending posteriorly into the pterygopalatine and infratemporal fossa, later through the inferior orbital fissure to involve the orbital tissues [5]. The infection may also spread to the periorbital tissues directly via the canine fossa or fascial planes over the thin buccal cortical plane that can easily be eroded [6]. Odontogenic infection can also spread into the orbit along the facial vein and the ophthalmic vein by hematogeneous route because these veins are valveless and pose great risk to the spread of infection [6].

Cases of orbital cellulitis should be co-managed by a multidisciplinary team to treat the patient as a whole. Broad spectrum intravenous antibiotics should be started empirically, and changed accordingly based on the culture and sensitivity results. Frequent assessment to monitor optic nerve function is mandatory where decision to intervene should be made if optic nerve is at risk. Repeated CT scan is a must, as in this case, when there are signs of deterioration.

Surgical treatment should be considered when patient's condition is not improving with IV antibiotics alone, large abscess (>10mm), any abscess that forms within the extraconal or intraconal space, or any signs of intracranial complications [7]. Abscesses usually form in the subperiosteal space of the orbit adjacent to the infected sinus but occasionally occur within the orbital soft tissues or in the preaponeurotic space.

An IOP greater than 40 mmHg with signs of optic nerve and associated vasculature compression can lead to rapid functional compromise and blindness [8,9]. Lateral canthotomy and inferior cantholysis helps to relieve the tensed globe and optic nerve compression as well as create adequate access for complete drainage of the abscess as seen in this case [8]. Disinserting the lateral canthal ligaments from the orbital rim allows anterior displacement of the orbital contents, leading to a rapid reduction in intraorbital pressure and reperfusion optic nerve and retinal circulation [8].

CONCLUSION

Timing of intervention is crucial in an attempt to reverse the insult to the optic nerve. A comprehensive treatment can be achieved by a good collaboration with respective specialty. Recognition and alertness of the red flags in orbital cellulitis not only save the patient's sight but also their lives.

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