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## Case Report

# Orbital apex syndrome secondary to osteomyelitis of maxilla following dental caries

Sneha KR<sup>1</sup>, Fauzia Ara<sup>1,\*</sup>, Keerthi B<sup>1</sup><sup>1</sup>Dept. of Ophthalmology, Minto Ophthalmic Hospital- Regional Institute of Ophthalmology, Bangalore Medical College and Research, Bengaluru, Karnataka, India

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### ABSTRACT

**Purpose:** To report a case of unilateral orbital apex syndrome with periorbital abscess secondary to osteomyelitis of maxilla following right upper molar dental caries

**Materials and Methods:** A 37 years old female patient presented with fever and toothache 1 month ago treated in a local hospital following which she developed facial swelling, drooping of left eyelid and sudden, progressive diminution of vision in left eye. Patient underwent tooth extraction following which facial swelling worsened. She was newly diagnosed as diabetic. Visual acuity in Right eye was 6/6 and in Left eye was PL negative. Detailed Slit lamp examination, fundus examination and cranial nerve examination was done. CT and MRI scan was done.

**Conclusion:** This case highlights the importance of early diagnosis and timely management of dental caries to prevent dreaded complications like orbital apex and cavernous sinus involvement.

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## 1. Introduction

Osteomyelitis is an inflammatory condition of the bone beginning as an infection of the medullary cavity involving the haversian system and on extension involves the periosteum. Predisposing factors include malnutrition, diabetes mellitus, leukemia, anemia, syphilis, agranulocytosis, chemotherapy, and radiotherapy.<sup>1</sup> The orbital apex, formed by the superior orbital fissure and optic canal, is the cross-road between the orbit and the intracranial structures. Pathological processes may extend intracranially via the superior orbital fissure and vice versa. In addition to intrinsic soft tissue lesions, various pathological processes may involve the surrounding osseous anatomy.<sup>2</sup>

Cavernous sinus syndrome includes hypoesthesia of the cheek and lower eyelid with signs seen in orbital apex

syndrome.<sup>3</sup> These disorders result from various etiologies, including trauma, neoplastic, developmental, infectious, inflammatory as well as vascular causes.<sup>4</sup> To report a case of unilateral orbital apex syndrome with periorbital abscess secondary to osteomyelitis of maxilla following right upper molar dental caries. To highlight the importance of careful diagnosis and early treatment of simple dental caries in order to prevent severe complications threatening vision.

## 2. Case Report

A 37 years old female presented with fever with toothache followed by facial swelling since one month associated with drooping of left eyelid and diminution of vision since 2 weeks. Following tooth extraction, facial swelling worsened. No history of nasal discharge, nasal block, ear discharge, throat pain, difficulty in swallowing, Change in voice. No history of difficulty in having food, earache, nasal regurgitation or swelling in the neck. No History

\* Corresponding author.

E-mail address: [fauziaara@gmail.com](mailto:fauziaara@gmail.com) (F. Ara).

of loss of appetite or loss of weight. Newly diagnosed diabetes. Influenza-Like Illness with Covid positive status and received treatment.

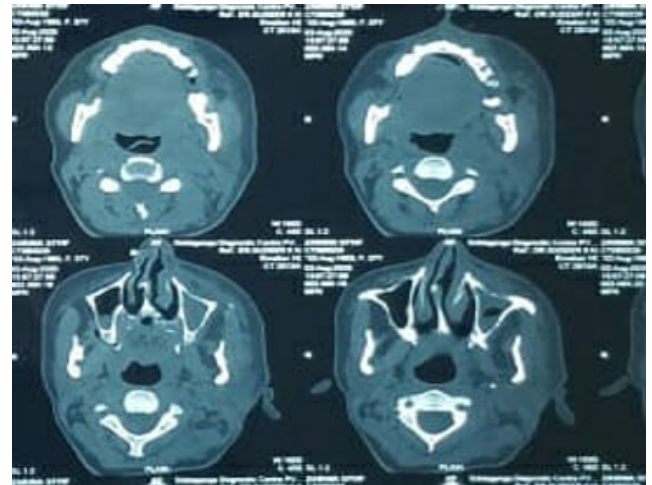
1. On examination the vitals were stable. FACE - facial asymmetry: Deviation of mouth to right; Nasolabial fold absent on left side; Angle of mouth deviates to right side; Forehead wrinkling-absent on left side Sensation on left side of upper face - absent (ophthalmic division of trigeminal nerve); Left facial nerve palsy - LMN type (grade 5 HB). Right eye - Vision 6/6; B/L periorbital oedema; periorbital abscess; Direct reflex-present; Indirect reflex-absent; eye movements-normal. Left eye - Vision PL negative; complete ptosis; fixed dilated pupil; Absent eye movements left side. NOSE - Root, dorsum, tip- normal; Anterior rhinoscopy: Right nasal cavity - healthy pinkish mucosa noted. Left nasal cavity- inferior turbinate hypertrophy present. Minimal crusting present. right sided DNS present.
2. PNS - No tenderness.
3. Oral cavity - dental formula 0012/2100 0112/2101; Dental caries noted on right upper molar; Oropharynx-normal; Neck-normal.
4. Osteomyelitis of left maxilla.
5. Left parotitis.
6. Left cervical lymphadenopathy.



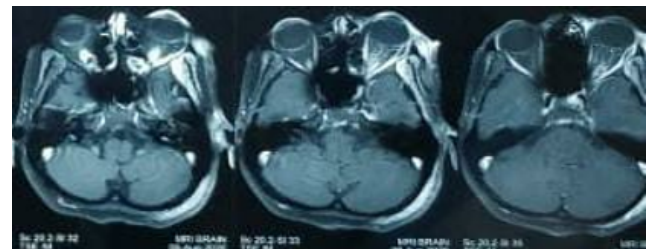
**Fig. 1:** LE proptosis with periorbital oedema with LMN palsy.

Diagnostic nasal endoscopy showed deviated nasal septum to right with spur on right; the left nasal cavity showed inferior turbinate hypertrophy. Mild mucoid discharge was noted on floor of nose with minimal crusting;

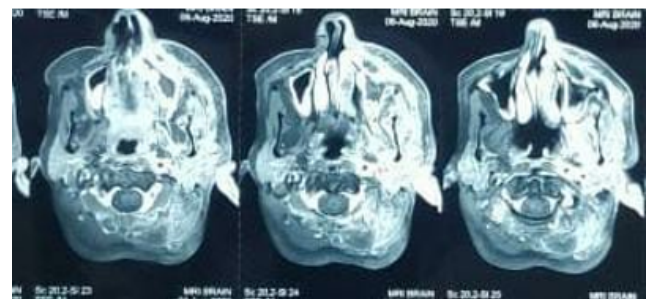
Choana visualized on either side; nasopharynx normal. MRI - features are s/o osteomyelitis of maxilla on the left side with significant inflammatory changes in the surrounding soft tissues extension of inflammation through pterygomaxillary fissure into left orbital apex. CT brain showed normal brain study and maxillary sinusitis. All lab parameters normal except for high blood sugars (grbs-520 at time of admission).



**Fig. 2:** Showing soft tissue opacity in left maxillary sinus suggestive of maxillary sinusitis.



**Fig. 3:** MRI Brain and orbit: T2 weighted axial image shows soft tissue extension into left orbital apex.



**Fig. 4:** MRI Brain and Orbit: Osteomyelitis of maxilla on left side with inflammatory changes through pterygomaxillary fissure into left orbital apex.

Diagnosis was based on clinical presentation, radiographic features. Management of orbital apex syndrome is directed towards the causative factor. This case required management in a multidisciplinary team involving both otolaryngology and ophthalmology. Functional endoscopic sinus surgery (FESS) is a safe and effective method for orbital apex syndrome caused by sinus diseases, which is the primary therapy for the disease.<sup>5</sup> Patient underwent FESS and was started on piperacillin with tazobactam, metrogyl and amikacin intravenous for 2 weeks.

### 3. Discussion

Osteomyelitis arises most commonly due to odontogenic infections arising from the pulp in immunocompromised individuals with predisposing factors. Characteristic clinical findings include pain, swelling, foul-smelling discharge with sinus formation.<sup>1</sup> Ophthalmoplegia results from impairment of CN III, IV, and VI. Ptosis results from impaired cranial nerve III innervation to the levator palpebrae superioris muscle or by loss of sympathetic innervation to the superior tarsal muscle.<sup>4</sup>

Proptosis is caused by the loss of extraocular muscle tension on the globe, retrobulbar swelling, or venous congestion. Impaired parasympathetic innervation from cranial nerve III results in mydriasis. Involvement of the naso-ciliary nerve results in loss of corneal reflex. Injury to the optic nerve occurs most commonly at the intracanalicular portion of the optic nerve, especially in traumatic damage.<sup>4</sup>

### 4. Conclusion

In osteomyelitis of maxilla, early diagnosis and prompt treatment are necessary to prevent complications such as involvement of the orbit, cranial cavity, and oro-antral communication. An aggressive approach with combined medical and surgical intervention and follow-ups is the key to prevent morbidities associated with the disease. This case highlights the importance of early diagnosis and timely management of dental caries to prevent

dreaded complications like orbital apex and cavernous sinus involvement. This case also highlights the role of ophthalmologist in management and diagnosis of the such conditions and prevent further ocular morbidity.

### 5. Acknowledgment

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### 6. Source of Funding

None.


### 7. Conflict of Interest


None.


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### Author biography

**Sneha KR**, Resident  <https://orcid.org/0000-0002-2136-2436>

**Fauzia Ara**, Resident  <https://orcid.org/0000-0001-9650-1755>

**Keerthi B**, Resident  <https://orcid.org/0000-0002-9168-289X>

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