



ODONTOGENIC ORBITAL CELLULITIS – A CASE REPORT

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ABSTRACT Odontogenic source for orbital cellulitis is very rare, being reported in less than 5% of cases. The majority of cases of orbital cellulitis are secondary to cutaneous & paranasal sinus infection. Orbital cellulitis secondary to *Acinetobacter baumannii* infection has been described in one case report [1]. However, there have been a few case reports of *Acinetobacter* infection causing preseptal cellulitis [4]. We report a case of 56yr old man presented with swelling of the Right eye diagnosed with orbital cellulitis the primary focus of infection being dental in origin and on subsequent microbiologic evaluation, pus culture and sensitivity revealed growth of *Acinetobacter baumannii* which was sensitive to carbapenems. However, the patient faced a tumultuous hospital course with the swelling rapidly progressing to the opposite side and lips. CT Brain with contrast revealed no intracranial extension of infection or evidence of venous sinus thrombosis. The patient was in the intensive care unit and required mechanical ventilation. The patient's clinical condition improved after administration of imipenem parenterally. Dental extraction was done for the odontogenic source of infection.

KEYWORDS : Odontogenic Orbital Cellulitis, *Acinetobacter Baumannii*

INTRODUCTION

Orbital cellulitis is a life-threatening infection of the soft tissues behind the orbital septum. It is an ocular emergency that not only threatens vision but also can lead to life-threatening complications such as cavernous sinus thrombosis, meningitis, and brain abscess [7]. It must be distinguished from preseptal cellulitis (sometimes called periorbital cellulitis), which is an infection of the anterior portion of the eyelid. Neither infection involves the globe itself. Although preseptal and orbital cellulitis may be confused with one another because both can cause ocular pain and eyelid swelling and erythema, they have very different clinical implications. Preseptal cellulitis is generally a mild condition that rarely leads to serious complications, whereas orbital cellulitis may cause loss of vision and even loss of life. Orbital cellulitis can usually be distinguished from preseptal cellulitis by its clinical features (ophthalmoplegia, pain with eye movements and proptosis) and by imaging studies; in cases in which the distinction is not clear, clinicians should treat patients as though they have orbital cellulitis. Both conditions are more common in children than in adults, and preseptal cellulitis is much more common than orbital cellulitis.

The major causes of orbital cellulitis are sinusitis (58%), lid or face infection (28%), foreign body (11%), and hematogenous (4%), odontogenic 2-5%. *Staphylococcus* and *Streptococcus* are the most common causative organisms in adults, *Haemophilus influenzae* in children. Less common organisms are *Pseudomonas* and *Escherichia coli*. *Acinetobacter baumannii* as a cause for orbital cellulitis is extremely uncommon [5,6].

CASE REPORT

A 56 years old male with no comorbidities presented to the OPD with complaints of swelling & itching of the Right eye for 2days with no prior history of fever, ocular pain, headache, vomiting, trauma, recent surgery or insect bite. Physical examination revealed unremarkable vital signs and systemic examination was normal. Local examination revealed presence of swelling in relation to Right EYE extending supero-inferiorly 1cm above the supraorbital margin, extending 2cm below the lower border of mandible. Antero-posteriorly extending from medial canthus to the RT post auricular region.

Swelling was tender on palpation, warm & erythematous, firm in consistency with purulent discharge [Fig. 1]. Pus culture and sensitivity was sent, following which the patient was empirically started on intravenous cefoperazone-sulbactam and metronidazole empirically. However, there was no significant clinical improvement with the swelling rapidly progressing to the opposite side and involved the lips in addition to both the eyes, supraorbital region. Subsequently, the patient was shifted to the intensive care unit and required

mechanical ventilation, the hemodynamics however were stable with no requirement of ionotropes. In view of the rapid clinical deterioration, antibiotic therapy was escalated to intravenous Meropenem and Vancomycin. Additionally, a diagnosis of mucormycosis was considered for which fungal smear was sent which eventually turned out to be negative. Following escalation of antibiotics, the patient's clinical status improved and he was subsequently extubated. Oral examination revealed dental caries [Fig. 2] in relation to the upper 2nd & 3rd molar teeth for which he underwent dental extraction, this in combination with completion of 14 days of antibiotic therapy as per culture and sensitivity with intravenous imipenem.

LABORATORY INVESTIGATIONS

Lab parameter	Day 1	Day 3	Day 7	Day 14
Hb	15.5g/dl			15.6g/dl
Total count	11,500	19,000	10,800	8600
Platelets	2.07 lakhs	1.78 lakhs		2.38 lakhs
HbA1c	5.1%			
Serum Urea	28 mg/dl		18 mg/dl	16 mg/dl
Serum Creatinine	0.9 mg/dl		0.8 mg/dl	0.8mg/dl
LFTs	Normal			

- FUNGAL SMEAR – NEGATIVE
- BLOOD CULTURE & SENSITIVITY – NO GROWTH
- PUS CULTURE AND SENSITIVITY – ACINETOBACTER BAUMANNII SENSITIVE TO CARBAPENEMS (IMIPENEM AND MEROPENEM)
- CT PNS- Revealed cellulitis involving subcutaneous aspect of head, face periorbital region and anterior neck [Fig. 3].
- CT ORBIT (following 7 days of antibiotic therapy) - Mild reduction of subcutaneous oedema of face, periorbital region and resolution of mucosal thickening of sinuses [Fig. 4].
- CT BRAIN WITH CONTRAST - No evidence of intracranial extension/ cavernous sinus thrombosis.
- Diagnostic Nasal Endoscopy- Normal



Fig. 1

Fig. 2

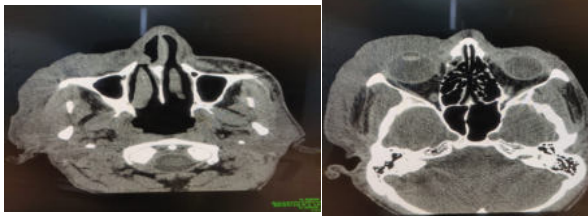


Fig.3

Fig.4

Reconstr Surg 2008; 24: 29-35.

7. Chandler JR, Langenbrunner DJ, Stevens ER. The pathogenesis of orbital complications in acute sinusitis. *Laryngoscope* 1970; 80: 1414-28.

DISCUSSION

Odontogenic orbital cellulitis represents a minority share less than 5% of all orbital cellulitis [3]. Most of the reported cases are secondary to paranasal sinuses & cutaneous infection. Majority of odontogenic infections are caused by anaerobes or a combination of both aerobic/anaerobic organisms. *Acinetobacter* being the primary source of infection is very rare.

MODE OF SPREAD [2]

- DIRECT: MAXILLARY SINUS
- RETRO MAXILLARY SOFT TISSUE

Spread through maxillary sinus is the most common route since the bone separating the molars & sinus may be often dehiscant or eroded secondary to infection.

Spread through soft tissues are mainly through the infratemporal fossa which is in direct contact with the posterior orbit.

INDIRECT SPREAD

Facial veins being valveless are an easy access for infection. Superior alveolar veins which drain the dental roots drains to Pterygoid venous plexus & infra orbital vein which anastomose with veins of orbit & cavernous sinus.

ACINETOBACTER BAUMANII is a gram negative cocco-bacillus which causes opportunistic infections. This species can grow in skin wounds, respiratory & GI tract. It also inhabits the oral biofilms thereby predisposing to pneumonia.

PATHOGENESIS [7]

FIVE factors are responsible

1. BIOFILM formation helps in colonisation
2. OUTER MEMBRANE PROTEIN-A (OMPA) – Protects the biofilm
3. K1 CAPSULE to prevent phagocytosis & complement activation
4. SIDEROPROTEIN MEDIATED IRON ACQUISITOR-helps the organism to sequester iron from the host
5. FIMBRIAE helps to grow in epithelial cells

Acinetobacter can grow or infect the eye especially in contact lens users. Ocular infections include endophthalmitis, orbital cellulitis & corneal ulcers.

FIRST LINE AGENTS-Broad spectrum cephalosporins/ carbapenems

RESISTANT ORGANISM- TETRACYCLINE (MINOCYCLINE/ TIGECYCLINE), POLYMYXIN

In our case patient was treated with Imipenam (for which *Acinetobacter* was susceptible, Vancomycin (empirical for MRSA) & Metronidazole (for anaerobic coverage), there was a significant improvement and marked resolution of physical signs and symptoms after initiation of antibiotics & dental extraction.

REFERENCES

1. González-Cannata, María & Medina-Zarco, Alfredo & González-Hinojosa, Diana & Aguilera-Ruiz, Karla & González-Núñez, Martha & Ochoa Araujo, Dora. (2020). Orbital cellulitis caused by *Acinetobacter baumannii*: A case report. *Revista Mexicana de Oftalmología (English Edition)*. 94. 10.24875/RMOE.M20000120.
2. Thakar M, Thakar A. Odontogenic orbital cellulitis. Report of a case and considerations on route of spread. *Acta Ophthalmol Scand*. 1995 Oct;73(5):470-1. doi: 10.1111/j.1600-0420.1995.tb00313.x. PMID: 8751133.
3. William Yan, Rahul Chakrabarti, Jessica Choong & Thomas Hardy (2015) Orbital Cellulitis of Odontogenic Origin, *Orbit*, 34:4, 183-185, DOI: 10.3109/01676830.2015.1014517.
4. Stead T G, Retana A, Houck J, et al. (July 06, 2019) Preseptal and Postseptal Orbital Cellulitis of Odontogenic Origin. *Cureus* 11(7): e5087. doi:10.7759/cureus.5087.
5. Yanoff and Duker *Ophthalmology*, 3rd Edition, Section 3: Orbital and Lacrimal gland.
6. Youssef OH, Stefanyszyn MA, Bilyk JR. Odontogenic orbital cellulitis. *Ophthal Plast*