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## RESEARCH ARTICLE

# ORBITAL CELLULITIS IN AN ELEVEN YEAR OLD BOY: CASE REPORT

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**ABSTRACT**

Orbital cellulitis is a serious opthalmological condition which is often caused by bacteria infection, and can cause serious complications including vision loss, intracranial involvement and even carvenous sinus thrombosis if there is no timely and prompt treatment. A11years old boy presented to our hospital with the symptoms of left eye pain, swelling, high grade fever and head ache. Upon clinical examination, the patient had limited ocular motility, tenderness when rotating the eyeball, and the Computed Tomography (CT scan) showed features of left orbital and periorbital cellulitis secondary to paranasal sinusitis. He was treated with intravenous antibiotics, incision and drainage of the abscess and functional endoscopic sinus surgery (FESS) was done by Otorhinolaryngologist. The patient had full recover after medical and surgical interventions and no complications occurred.



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# INTRODUCTION

**Background:** Orbital cellulitis is a serious ophthalmological condition characterized by the inflammation of the soft tissues surrounding the eye, often resulting from bacterial infections. The most common bacteria include streptococcus species, staphylococcus aureus, pseudomonas, enterococcus, klebsiella and haemophilus influenza type B.The most common cause is acute or chronic sinusitis especially ethmoid sinusitis when lamina papricea is involved. Orbital cellulitis can lead to complications including vision loss, and intracranial spread of infection if not treated promptly.

## CASE PRESENTATION

The patient was 11 years old male presented to ophthalmology clinic with a 5 days history of eyelid swelling, high grade fever, severe headache and protrusion of the left eye. The mother of the child reported that, he had been experiencing nasal obstruction, nasal discharge in one nose and general body malaise one week prior to the onset of ocular symptoms, he went to nearby hospital and has been treated as malaria, medications was given to him, but the patient symptoms were worsening and decided to come to Amana Regional Referral hospital.

### History

The patient had experienced on/off nasal obstruction, there were no known history of allergy; no history of trauma, no history of dental pain or dental procedures, no history of asthma from the family.

**Clinical examination:** On examination,the patient was alert, febrile T 39.7°c not dyspneic, not pale, no neck stiffness, BP 120/72mmHg, pulse 76 bpm.

### Ocular exam

OD VA 6/6 normal anterior and posterior segment. OS VA 6/12, the left eyelid was swollen with limited movement, There was pronounced proptosis, conjunctiva injections and chemosis, limited movement in ocular motility with pain when attempting moving the eyeball, the corneal was clear, pupil reacted to light and no RAPD, intraocular pressure 24mmHg. Palpation of the orbit revealed tenderness in the left superior aspect; no other abnormalities were noted in the systemic examination. Nose exam: normal external nose, patent both nostrils with yellowish mucoid nasal discharge, no mass seen, no bleeding. Ear: on otoscopy,there were normal external ears and timpani membrane Throat: normal throat.

**Fig 1. Photo of the patient at 1st day presentation**

**Investigations:** Given clinical suspicion of orbital cellulitis, CT scan of the orbit and paranasal sinuses was performed, revealed the following

- Opacification of the left ethmoid, frontal and maxillary sinuses
- Increased attenuation with mild peripheral enhancement of the left peri-orbital area with extraconal extension seen more along the medial and lateral rectus muscles.
- Increased orbital fatty stranding of the left eye indicating inflammation.
- Slight compression of the left orbit is noted with associated anterolateral proptosis.
- No evidence of abscess formation or intracranial extension.

CBC showed leucocytosis with white blood cell count 20,000cells/mm and elevated C-reactive protein level. Blood culture and sensitivity showed no growth of bacteria.

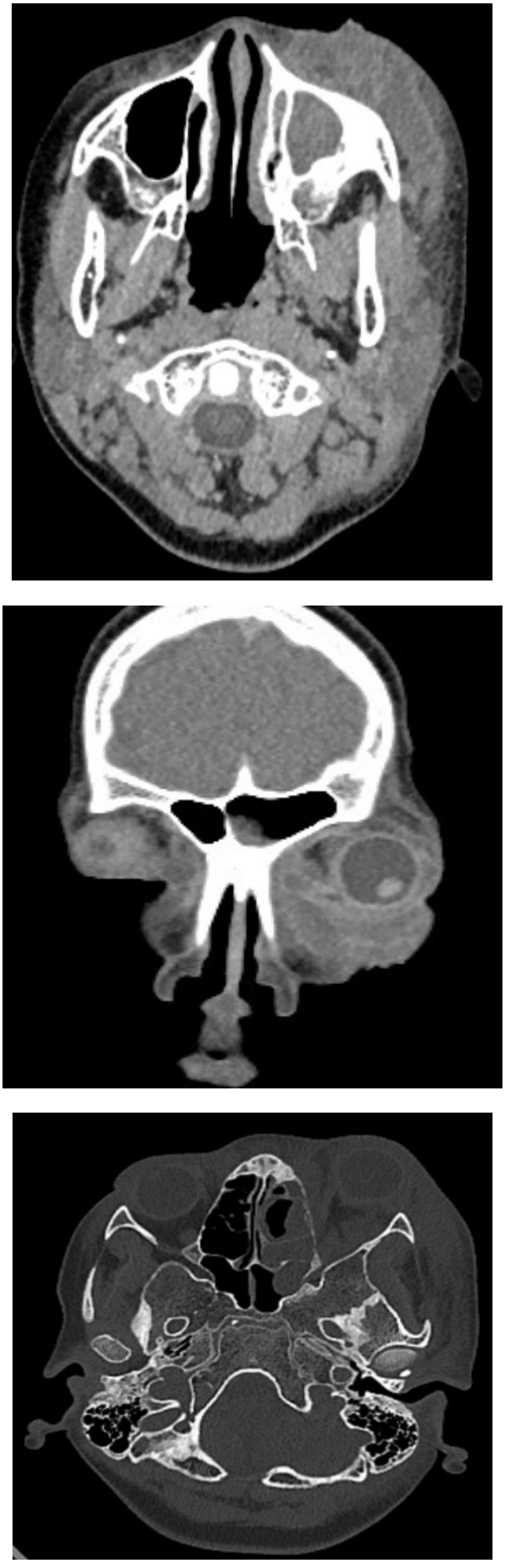

**Fig 2. Axial & coronal contrast-enhanced and axial bone window CT an of the orbit on admission, showing sinusitis of the ethmoid, frontal and maxilla, thickening of the medical rectus, peri orbital soft tissue swelling and proptosis of the left eye.**

**Management:** The patient was admitted and started on intravenous ceftriaxone and metronidazole to cover for most likely bacteria including streptococcus pneumonia, staphylococcus aureus, and anaerobic bacteria. Otorhinolaryngologist was consulted and reviewed the patient, since the management needs multidisplinary approach, and they add up intranasal corticosteroid, nasal decongestant and antihistamine. The patient was monitored closely for changes in visual acuity and signs of intracranial complications. 48 hours of IV antibiotics the patient still had high grade fever 39.0°c the visual acuity was dropping to 6/36, proptosis increased, the upper eyelid was very tender, marked swollen, redness and the skin open itself with oozing pus, the patient was taken to theater and incision and drainage was performed with coupious amount of pus was drained, he was still kept with IV antibiotics, 24 hrs post incision and drainage the patient fever dropped to 37.3c, proptosis subsided, the visual acuity increased to 6/24. The 3rd day post incision and drainage the wound was still oozing pus, therefore the ORL surgeon took the patient to theater for Functional endoscopic sinus surgery (FESS). One week post surgery the patent was discharged home with oral antibiotics, with full recover and the visual acuity was 6/9. Weekly follow up at ophthalmology and ORL clinic was done with no residual symptoms and his visual acuity had returned to baseline.

**Fig 3. The patient at 2nd week post discharge**

# DISCUSSION

Orbital cellulitis is an infection of the soft tissues of the orbit posterior to the orbital septum. This is in contrast to preceptal cellulitis which is the infection of the soft tissues of the eyelids anterior to the orbital septum. The most common organisms in orbital cellulitis include streptococcus species, staphylococcus aureus, pseudomonas, enterococcus, klebsiella and haemophilus influenza type B. Methocillin resistant staphylococcus aureus is becoming more common in orbital cecellulitis. Majority of cases occur as a secondary extension of acute or chronic bacterial sinusitis, especially ethmoid sinuses. Other extensions of periorbital structures include the face/eyelids, dacryocystitis and dental infections. Exogenous causes include trauma and orbital surgery. Endogenous causes include septic embolization from bacteremia. Also there may be intraorbital causes including endophthalmitis and dacryoadenitis. Regarding to our patient, since he presented with nasal obstruction and the CTscan showed the signs of chronic sinusitis therefore the cause of our case was chronic sinusitis. Clinical findings include proptosis, ptosis, restriction of ocular motility, ocular pain and chemosis. Systemic clinical findings are essential in the work up. Findings include leucocytosis and fever. This was the same presentation as to our patient.Doing CT scan of the orbits and paranasal sinuses is essential. Evidence of sinusitis mandates otorhinolaryngology involvement. Lumbar puncture is necessary if meningeal signs and symptoms develop. Conjunctival cultures add very little information, blood cultures are appropriate in the setting of septicemia. In our patient the blood culture was done but there were no sign of bacteria growth probably because the patient was already received antibiotics prior to admission to our hospital.

Surgical intervention is less likely in orbital cellulitis in children below 9 years old because the infection is caused by single gram positive organism. IV antibiotic therapy is the initial treatment of choice. The progression of / worsening of motility deficit, pan optic nerve dysfunction in a child after 24-48hours of IV antibiotics therapy would lead to drain the abscess. However, if this were in adult patient with evidence of abscess, early surgical intervention to drain the involved sinus and orbital abscess is usually indicated along with medical therapy given that the infection is more likely to be polymicrobial. Regarding to our patient, since the symptoms were not improving after 48hours of antibiotic treatment, the drainage of the abscess and the sinuses was performed and the patient gained the completely recover.

The indications of surgical management include

More than 9 yeas old patient, frontal sinusitis, non medial location of the subperiosteal abscess, large subperiosteal abscess, nasal polyps which suggest chronic sinusitis, evidence of acute optic neuropathy and dental infection. Majority of patients respond well to medical and /or surgical treatments, rarely orbital cellulitis may spread posteriorly to the carvenous sinus, meninges and the brain parenchyma. Differential diagnosis include: preceptal cellulitis, dacryoadenitis, dacryocystitis, endophthalmitis, thyroid eye disease, wegnersgranulomatosis, sarcoidosis, malignancy, idiopathic orbital inflammatory syndrome and churg-strauss. Therefore the radiological investigation is mandatory to diagnose orbital cellulitis. This case highlights the importance of early recognition and treatment of orbital cellulitis, particulary in children, where it may often present following a respiratory viral infection. The involvement of multidisplinary teams is crucial for optimal management and to prevent potential complications.

# CONCLUSION

Orbital cellulitis requires prompt diagnosis and intervention to prevent significant morbidity, this case illustrate successful management and close monitoring resulting in a favourable outcome.

**Consent:** Written informed consent was obtained from the parents for publication of this case report and accompanying images.

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**Abbreviations**

OD – Right eye
OS – Left eye
OU – both eyes
VA – visual acuity
IOP – intra ocular pressure
ORL- Otorhinolaryngology
RAPD – Relative Afferent Pupilary Defect

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