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**Case Report**

# Orbital cellulitis: early intervention saves vision

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## ABSTRACT

Orbital cellulitis describes an infection involving the soft tissues posterior to the orbital septum including the fat and muscle within the bony orbit. This condition is associated with severe sight and life-threatening complications. Distinguishing it from preseptal cellulitis is difficult, but important. Acute sinusitis is the commonest predisposing factor. Clinical findings alone are not specific enough to distinguish between preseptal and post septal orbital cellulitis. Early diagnosis using CT orbit is important to rule out complications such as orbital cellulitis, subperiosteal abscess. The most common location of subperiosteal abscess is the medial wall of the orbit. Transnasal endoscopic drainage of the abscess is a functional and minimally invasive technique and is the treatment of choice at present. Early diagnosis and intervention are mandatory to prevent the visual loss and life-threatening complication.
Here, the authors describe a 2 months old infant with orbital cellulitis and medial subperiosteal abscess and treated with transnasal endoscopic drainage of the subperiosteal abscess.

**Keywords:** Orbital cellulitis, Periorbital swelling, Proptosis, Subperiosteal abscess, Transnasal endoscopic drainage

## INTRODUCTION

Orbital cellulitis is used to describe infectious involvement of the tissue's posterior to the orbital septum. Pre septal cellulitis characterizes cellulitis of the tissues anterior to the orbital septum. This distinction is important , as orbital cellulitis may be associated with significant visual and life threatening complications.[1,2]

Orbital cellulitis is most often caused by extension of infection from adjacent sinuses, especially the ethmoid sinus.[3]

Signs of orbital cellulitis include swelling and redness of the eyelid and surrounding soft tissues, conjunctival hyperemia and chemosis, decreased ocular motility, pain with eye movements, decreased visual acuity, and proptosis caused by orbital swelling.[1,2]

## CASE REPORT

A 2 months old male infant, first born to second degree consanguineous parents was brought to Paediatric emergency department with history of high-grade fever for 2 days, redness and swelling of the right eye progressively increasing in size for 2 days, history of poor feeding, feeble cry and not opening the right eye since morning. Baby has had cold past 3 days. On arrival, the baby was febrile 103.5`f, lethargic, drowsy, in shock. Right eye examination revealed right periorbital erythema, marked right periorbital edema and proptosis. (Figure 1) Resuscitated with oxygen, isotonic fluid boluses and dopamine infusion in view of persistent shock. Blood investigations revealed elevated total counts with highly positive CRP. Suspecting orbital cellulitis, baby initiated on IV meropenem and vancomycin along

with antibiotic eye drops and other supportive measures. Blood culture grew staphylococcus aureus.

Fever spikes resolved. Periorbital erythema and edema resolved gradually. The child became hemodynamically stable. However, there was proptosis of the right eye and restriction of medial gaze on right eye. Conjunctiva was normal. Pupillary reactions were normal. Fundoscopy did not show any abnormality.

MRI orbit revealed right medial subperiosteal abscess with maxillary and ethmoidal sinusitis. (Figure 2) MRI brain, MRV and MRA were normal.

**Figure 1: Right eyelid swelling and proptosis.**

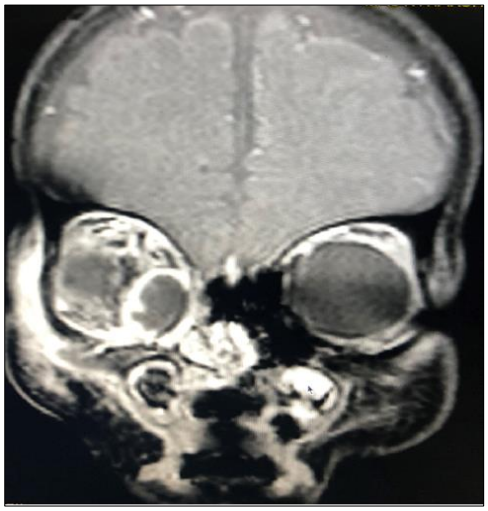

**Figure 2: MRI orbit showing post septal right orbital cellulitis, subperiosteal abscess with right maxillary and ethmoidal sinusitis.**

Under general anaesthesia, Trans nasal, endoscopic drainage of subperiosteal abscess was done and thick pus drained (Figure 3).

Pus culture grew staphylococcus aureus. treated with iv antibiotics for 2 weeks. Proptosis subsided immediately after surgery (Figure 4). Repeat blood culture was sterile. Restriction of medial eye movements on right side resolved gradually. The baby was discharged with normal extraocular movements and social smile.

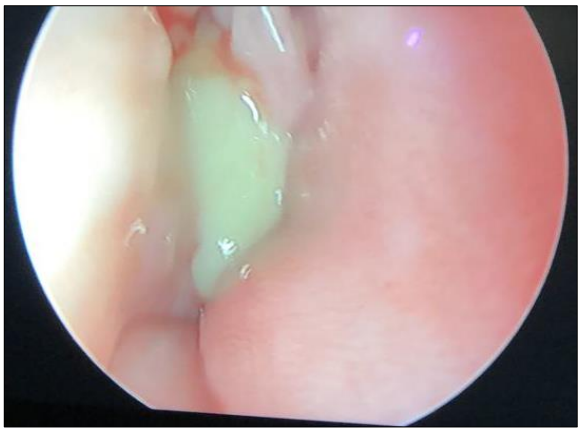

**Figure 3: Trans nasal endoscopic drainage of subperiosteal abscess and drainage of thick pus.**

**Figure 4: Resolution of proptosis and lid edema after surgery.**

## DISCUSSION

Orbital (post septal) cellulitis is used to describe infectious involvement of the tissue's posterior to the orbital septum. Preseptal cellulitis, in contrast, characterizes a cellulitis of the tissues localized anterior to the orbital septum. Orbital cellulitis, may be associated with significant visual and life-threatening sequelae, including optic neuropathy, encephalomeningitis, cavernous sinus thrombosis, sepsis, and intracranial abscess formation. The medial wall is a common location for the development of subperiosteal abscesses.[1,2]

Acute sinusitis of ethmoidal and maxillary complex is the most frequent cause of subperiosteal Abscess. The incidence of subperiosteal abscess is 15% in children. The close anatomic relationship of the orbit to the paranasal sinus predisposes to the contiguous spread of infection through the ophthalmic venous system.[3]

Orbital infections encompass a wide range of causative factors; bacterial septicaemia, penetrating injury or secondary to skin infection. This condition affects all the age group but is more common in paediatric population.[3]

Orbital clinical findings include proptosis, ptosis, and restriction of ocular motility, ocular pain and chemosis. The

typical presentation of preseptal cellulitis is inflammation of the eyelid, without proptosis or restriction of gaze. the differentiation between preseptal and septal cellulitis is important and cannot be made with clinical examination alone. Delay in treatment can result in blindness in up to 10% patients with a subperiosteal abscess.[3,4]

Group A beta- haemolytic streptococci, S. aureus, S. pneumoniae, H. Influenza, M catarrhalis, other streptococcal species, and anaerobic microorganisms are the microorganisms responsible for orbital cellulitis in paediatric patients.[5,6]

CT of the orbits and paranasal sinus is essential providing information on the extension of the disease into the orbit, identification of concurrent sinus disease and detection of the presence of orbital and subperiosteal abscess. Magnetic resonance imaging provides superior resolution of orbital soft tissues of the orbits compared to CT or ultrasound.[1]

Blood culture should be obtained in all patient in concerns for systemic toxicity. Lumbar Puncture is essential if meningeal signs and symptoms develops. Blood cultures are appropriate in the background of septicaemia. If surgical drainage of the orbit and /or sinus is performed, cultures should be obtained.

Intravenous antibiotics should be started promptly for all cases of orbital cellulitis. treatment regimens are based on empiric coverage of most common causative organisms typically gram-positive organisms such as staphylococcus aureus and streptococcus. Antibiotic selection may be later modified as per culture and sensitivity pattern, trends in antibiotic susceptibility are critically important consideration.[1]

Because of the potential loss of vision and devastating morbidity associated with a Subperiosteal abscess, immediate surgical drainage is recommended when there is Impairment of vision, worsening of periorbital edema or erythema, proptosis and restriction of gaze or when there is a lack of response to an initial appropriate IV antibiotics.[2]

With advances in Sino nasal surgeries, trans nasal endoscopic drainage of subperiosteal abscess has been popularized, as it reduces the need for an external incision and facilitate drainage of sinuses.[7,8]

## CONCLUSION

Orbital cellulitis is a visual and life-threatening emergency in children. Distinguishing it from preseptal septal cellulitis is very important and clinically difficult. Orbital cellulitis should be suspected in any child presenting with proptosis and restriction of extraocular movements. Timely neuroimaging of the orbit confirms orbital cellulitis and complications such as subperiosteal abscess. Early surgical intervention can save the vision.

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