An Orbital Cellulitis Demanding Multispeciality Management

N Ezhilvathani, Thiagarajan, T Cherian

Abstract
Orbital cellulitis is an emergency. Confusion still exists between the diagnosis of this serious condition and that of pre-septal cellulitis. Delay in treatment may cause blindness and progression to life-threatening sequelae such as brain abscess, meningitis or cavernous sinus thrombosis. We report a case in which, despite late referral, emergency surgical intervention was sight and life saving.

INTRODUCTION
Orbital cellulitis is an emergency. Confusion still exists between the diagnosis of this serious condition and that of pre-septal cellulitis. Delay in treatment may cause blindness and progression to life-threatening sequelae such as brain abscess, meningitis or cavernous sinus thrombosis. We report a case in which, despite late referral, emergency surgical intervention was sight and life saving.

CASE REPORT
A 15 year old patient was brought to the casualty with complaints of sudden abnormal movement of neck and mouth preceded by a history of swelling of left eye for 4 days, fever and head ache for 5 days.

He was referred by the local practioner for CT scan of orbit. The patient became restless during the procedure of CT and shortly after the scan he threw abnormal movements of lips and neck. The patient was apparently normal 5 days ago. He was treated with antibiotics for 3 days by the local practioner prior to his referral.

On examination the patient was stuporous, febrile (102 degree F) PR: 88/mt B.P : 120/70mmHg and with peri-oral twitching. His cardiovascular, respiratory and abdominal system was normal.

Ocular examination revealed a marked peri-orbital edema, erythema and proptosis. He had conjunctival congestion and chemosis. Cornea and anterior chamber was normal. RAPD was present in both eyes. Fundus examination revealed bilateral papilloedema. CT revealed left orbital cellulitis with gross left ethmoidal and maxillary sinusitis. A provisional diagnosis of left sided sinusitis with left orbital cellulitis with meningitis was made.

Figure 1
Figure 1: Shows peri-orbital edema & erythema.
Haematological parameters revealed leucocytosis. CSF analysis also showed leucocytosis. However, CSF culture did not reveal any positive growth.

A surgical drainage of the sub-periosteal abscess of the left orbit in the supero-nasal part of the globe was done as guided by the CT and a drain was kept in situ. Antimeningitic doses of broad spectrum antibiotics was started parenterally. The patient improved for half a day and began to deteriorate in consciousness and continued to develop convulsions despite anti-epileptics and antibiotics. Urgent MRI with venogram was done to rule out cavernous sinus thrombosis. MRI revealed left fronto-parietal-temporal subdural empyema with no cavernous sinus thrombosis.

Emergency neuro-surgery opinion was sought and an emergent burr hole evacuation of about 60 ml of sub-dural and 20 ml of sub-galeal empyema was drained. The patient’s general condition improved and left external fronto-ethmoidectomy was done a week later. The patient’s visual acuity was 6/6 in RE and 6/18 in LE during the first post operative week. Colour vision was defective in both eyes due to the persisting but resolving papilloedema. He has a 2mm ptosis due to levator palpabrae disinsertion during the immediate post operative period. On 4 months follow up the patient had 6/6 vision, normal colour vision in both eyes and an improved ptosis in left eye. However, he had a right upper quadrantinopia in both eyes, due to affection of temporal optic radiation fibres.
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Figure 4
Figure 4: Patient underwent drainage of sub-periosteal abscess and sub-dural empyema.

Figure 5
Figure 5: 2 Week post op.
Figure 6
Figure 6: 3 weeks post op.

Figure 7
Figure 7: Bjerrums screen and HFA showing right upper quadrantanopia.

Figure 8
Figure 8: 6 Months post op.

DISCUSSION
Orbital cellulitis is an acute inflammation of all or a part, of the contents of the orbit, characterized by edema of the eyelids and conjunctiva. When the inflammation progress to
suppuration, the edema rapidly increases. The eyeball becomes immobile and displaced forwards, and the conjunctiva becomes so edematous as to protrude between the lids. In the pre-antibiotic era, orbital cellulitis frequently led to blindness and even death.

Paranasal sinus disease remains the commonest cause of orbital cellulitis. Schram et al noted a 74% incidence of clinical and radiological evidence of sinusitis. There are three parts by which inflammation can extend to orbit. The first, and commonest, is a direct spread from the nose through the bone or along the ethmoidal vessels. The second is by the blood stream when the orbital cellulitis is a part of a septicaemia or pyaemia. The third way is by lymphatic spread, but there are no glands in the orbit. These lymphatics drain into the parotid and deep cervical lymphatic nodes and do not extend to the nose.

Haemophilus influenza, streptococcus pneumonia, staphylococcus aureus and streptococcus pyogenes are the commonest causes of orbital cellulitis. Anaerobic bacteria are not commonly associated but they may also cause orbital cellulitis.

Many patients have been stared on antibiotics by the primary physician before initial referral. Furthermore, many of the patients were given antibiotic therapy after referral and prior to obtaining cultures. This probably lowers the number of positive cultures.

CT orbit will usually outline the extend of orbital involvement. Most abscesses are well localised except in acute cases evolving over 24 to 48 hrs. Here CT scans may show only non-specific inflammation of the orbit, such as sclerouveal rim thickening and muscle engorgement. When an abscess is suspected but not confirmed by CT scans, ultrasonography may confirm its presence, with its usual internal acoustic characteristics.

Simultaneous intra-cranial and orbital complications are rare but significant occurrences do occur in acute pediatric rhinosinusitis. Cavernous sinus thrombosis, hypopituitarism, subdural empyema, cerebral abscess and meningitis are some of the grave complications. Because of the high incidence of intracranial findings, we recommend MRI with contrast in addition to CT scan along with aggressive management in children older than 7 years of age.

In this case, the upper quadrantanopia could be because of the basal meningitis and the involvement of the perforating vessels causing ischaemia of lower temporal fibres.

**TREATMENT**

Often a combined ophthalmological, otolaryngological approach is required to establish drainage of both the sinus and the orbit. The drains are left in place until drainage stops. In our case, a neuro-surgical approach was also required for the drainage of the subdural empyema.

1. Cefotaxime: Semisynthetic broad spectrum antibiotic for parenteral use. Effective against gram positive aerobes, gram negative aerobes and anerobes. Dose: 1-2g in 10ml sterile water for injection over a period of 3-5 minutes q4h; should not be administered over < 3 minutes.
2. Vancomycin: adults – 2g/day IV divided q6h or 1g q12h administered over 1 hr; slowly at rate <10 mg/minute at concentration <5mg/ml.
3. Amikacin: IV 2 250mg in divided doses.
5. Inj. Mannitol
6. Inj. Phenytoin
7. Corticosteroids: may be helpful, but should not be started until after any surgery is performed and until the patient has been on appropriate antibiotics for 2-3 days.
8. Supportive measure like anti-pyretics and analgesia.
9. Renal liver parameters should be monitored.

**CONCLUSION**

Early recognition of clinical signs, urgent admission, aggressive, appropriate parenteral antibiotic therapy, investigations and judicious multispeciality surgical intervention can considerably decrease the frequency of serious life threatening complications of orbital cellulitis.

**References**

5. Orbital cellulitis bacteria; Eye 5; 640-641.
Author Information

N. Ezhilvathani, M.S
Associate Professor of Ophthalmology, Pondicherry Institute of medical sciences

Thiagarajan, M.S,Mch

Thambi Cherian, M.S E.N.T.