



CASE REPORT ON UNILATERAL ORBITAL CELLULITIS WITH RHINOSINUSITIS

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ABSTRACT

Orbital cellulitis is not an uncommon condition in pediatric age group. It is a potential sight-threatening infection of the ocular adnexal structures posterior to the orbital septum. Acute bacterial sinusitis remains the most common cause of orbital cellulitis in the pediatric age group. Periorbital infections lead to severe condition of the orbital abscess, and eventually to sight loss, and even death. Despite significant advances in antimicrobial therapies and diagnostic technologies, the management of orbital cellulitis often remains challenging to pediatricians. This article advocates need of rapid diagnosis and prompt initiation of therapy are important in minimizing complications associated with orbital cellulitis and optimizing outcomes.

KEYWORDS :

INTRODUCTION:

Orbital cellulitis is an acute inflammatory disorder of the orbit. Orbital (postseptal) cellulitis is used to describe infectious involvement of the tissues posterior to the orbital septum, including the fat and muscle within the bony orbit. Preseptal cellulitis, in contrast, characterizes a cellulitis of the tissues localized anterior to the orbital septum. It is thought to occur as a result of an acute spread of infection from the blood, adjacent sinuses, and facial skin.(1) Periorbital trauma and dental infection are other sources of spread to the orbit.(1) 90% of cases occur secondary to acute or chronic bacterial rhinosinusitis, especially the ethmoid sinuses. It can also result from infections spreading from face/eyelids, dacryocystitis and dental infections. Exogenous causes include trauma and orbital/periorbital surgery. Endogenous causes include septic embolization from bacteremia. There may also be intraorbital causes including endophthalmitis and dacryoadenitis.

Although orbital cellulitis can occur at any age, it is more common in the pediatric population. The incidence of pediatric orbital complications from acute rhinosinusitis ranges between 3 and 7%.(2) Periorbital infections needs to recognize earlier as it can lead to severe complication of orbital abscess, and eventually to sight loss, and even death (3,4). Risk of rapid deterioration is high so it requires aggressive management in order to minimize complications and optimize outcomes. Most cases seen in the hospital and reported in texts are unilateral, bilateral involvement seen if the cavernous sinus is involved.

Here we present a case of 4 year-old male child with unilateral orbital cellulitis complicating rhinosinusitis.

Case Presentation:

A 4-year-old male child presented with swelling of the right eyelid and painful protrusion of the eyeball of 7 days duration. There was a history of catarrh of more than 2 weeks duration prior to this. There was also associated history of fever and headache.

On examination child found to be acutely ill looking with right peri-orbital swelling. He was febrile with a temperature of 100°F with tachycardia and tachypnea and had tenderness over the maxillary, ethmoidal, and frontal sinuses. There was no swelling or tenderness at the mastoid area. Child had painful ocular motility and there was a non-axial proptosis with inferonasal displacement of the right globe.



Figure 1 Photograph taken on the 2nd day of admission showing left eyelid swelling and maxillary swelling.

Visual acuity was 6/9 in the right eye and 6/6 in the left eye and abduction was restricted in right eye. Bilateral pupils were reacting normally and fundus examination was within normal limits. The investigations requested were white blood count (WBC) (total and differentials), ESR, CRP, CT scan head, blood culture, microscopy, culture. The investigation results were: WBC: 26,000/ mm³ with neutrophil: 78%, lymphocytes: 22%, ESR was 70 mm in 1st hour, CRP was 8 mg/L .CECT orbit suggestive of pansinusitis with right orbital cellulitis involving pre and post-septal compartment with fat stranding in pre-septal region with no evidence of any post septal collections or sub-periosteal abscess. Right medial rectus was slightly bulky as compared to left medial rectus. Right globe was slightly deviated inferolaterally.

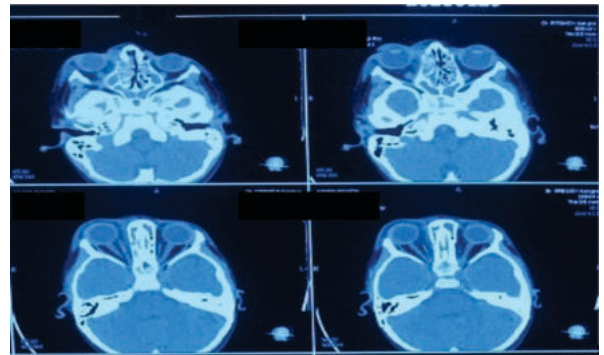


Figure 2 CECT image of orbit showing right orbital cellulitis involving pre and post septal compartment with pansinusitis.(chandler's grade 2 classification of orbital cellulitis).There was no evidence of cavernous sinus thrombosis.

The patient was started empirically on intravenous (IV) ceftriaxone, IV ampicillin and cloxacillin. Patient was monitored regularly for the visual acuity and pupillary reactions. He responded well to antibiotics and became fever-free by day 4 of admission with progressive decrease in periorbital swelling.

DISCUSSION:

Orbital cellulitis describes infections that involve the tissues posterior to the orbital septum, including the fat and muscle within the bony orbit. Orbital cellulitis affects all age groups but is more common in the pediatric population. There are number of notable predisposing factors to the development of orbital cellulitis, including hematogenous spread in the setting of bacteremia or direct inoculation from trauma or surgery, or as a result of extension of infection or inflammation from adjacent paranasal sinuses, ocular and adnexal structures. Secondary extension of infection from the paranasal sinuses is one of the most frequent causes of orbital cellulitis particularly from the ethmoid sinus.

Orbital cellulitis are commonly caused by bacterial organisms but can also be polymicrobial, often including aerobic and anaerobic bacteria and even fungal or mycobacteria are not uncommon. The most common bacterial organisms responsible for orbital cellulitis are *Staphylococcus aureus* and *Streptococci* species. Rare cases of orbital cellulitis includes non-spore-forming anaerobes *Aeromonas hydrophila*, *Pseudomonas aeruginosa*, and *Eikenella corrodens* have also been reported (5). Patient usually presents with severe eyelid edema, periorbital erythema, visual problems, painful eye movement, and ophthalmoplegia. Total vision loss and even death can occur in severe cases. There is typically a history of acute upper respiratory tract infection in the days preceding the development of periorbital swelling. Symptoms may progress rapidly with rapid deterioration, as such, prompt diagnosis and expeditious treatment are required.

Orbital cellulitis is primarily diagnosed clinically by objective findings on physical examination combined with presenting signs and symptoms. The diagnosis of orbital cellulitis can be confirmed by radiological investigation such as Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). Contrast CT can be useful in differentiating between an abscess and inflammatory phlegmatous involvement of orbital tissues. To assess severity and risk of progression, Chandler et al. in 1970, proposed the classification of orbital complications depending on its extension: I—preseptal cellulitis; II—orbital cellulitis; III—subperiosteal abscess; IV—orbital abscess; V—cavernous sinus thrombosis(6). Category five associated with intracranial involvement carry high mortality risk. Given the potential for significant life threatening complications, intravenous antibiotics that cover the most common pathogens involved in paranasal sinus infections should be started promptly (7).

Treatment regimens are based on empiric coverage of most common causative organisms, typically gram-positive organisms such as *Staphylococcus* and *Streptococcus*. MRSA cover or third-generation cephalosporins with better central nervous system penetration are also advocated by some to reduce the risk of intracranial dissemination of infection.

The first 72 hours of presentation are crucial and effective treatment within this period could reduce CRP levels, the incidence of abscess development requiring surgical drainage, and overall duration of hospitalization (8).

Although the role for surgical intervention is evident in the presence of neurological or intraorbital complications, its role in orbital cellulitis and early subperiosteal abscesses is controversial. Surgical complication rates have reported of up

to 20%(9), so medical management is sometimes preferred. Surgical intervention should be considered when there is no improvement or deteriorate while on intravenous antibiotics, or shows worsening visual function/pupillary changes, or develop an orbital abscess. An ophthalmologist and otolaryngologist should also be consulted for proper examination. The majority of patients with non-complicated orbital cellulitis respond well to medical treatment. Rarely, orbital cellulitis may spread posteriorly to the cavernous sinus, meninges and the brain parenchyma.

In our case patient started empirically on I.V ceftriaxone and I.V ampicillin and cloxacillin. His symptoms improved gradually with progressive decrease in lid edema. The patient was monitored every 12 hours by ophthalmology. His ocular motility also restored within 24 hours. He was planned to give 10 days course of antibiotics therapy.

CONCLUSION:

Orbital cellulitis is not an uncommon condition in pediatric population with the potential for significant visual and life-threatening complications. Most patients respond quickly to appropriate antibiotic therapy. Prompt diagnosis and expeditious treatment are important in minimizing complications. Serious complications such as cavernous sinus thrombosis, intracranial extension, and vision loss can lead to permanent sequelae.

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