



A CASE OF ORBITAL CELLULITIS WITH SUPERIOR OPHTHALMIC VEIN THROMBOSIS SENTHAMARAI

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Abstract : 9 year old female child presented to us with complaints of painful forward protrusion of right eye of three days duration following a boil over her nose. Clinical examination revealed complete ptosis of right eyelid with prominent veins and painful external ophthalmoplegia. She was treated with intravenous broad spectrum antibiotics in coordination with paediatrician and emergency MRI with venography was suggested which showed orbital cellulitis with superior ophthalmic vein thrombosis with sparing of cavernous sinus. Thrombolytic therapy was initiated by neurologist following which patient recovered uneventfully and follow up showed resolution of thrombosis.

Keyword : Orbital cellulitis, superior ophthalmic vein thrombosis.



PATIENT (FIG 1,2,3)

INTRODUCTION: Orbital cellulitis, one of the most common causes of proptosis in a child with potential systemic and visual threat^{1,2}. An accurate history and clinical examination provides most of the information to reach a diagnosis. A history of fever, upper respiratory tract infection, lacrimal outflow obstruction, sinusitis, or trauma should carefully be elicited. Preseptal infection may present with lid edema and redness, the ocular examination otherwise being normal. The presence of a demarcation line corresponding to the arcus marginalis, conjunctival chemosis, proptosis, ophthalmoplegia, or loss of vision are, however, all features of orbital (postseptal) infection, although early postseptal extension may be associated with more subtle signs. Orbital apex syndrome or cavernous sinus thrombosis must be

considered in more severe cases, particularly if loss of vision occurs. Finally, signs of meningitis – such as opisthotonos or lethargy – must be sought as manifestations of intracranial spread of an orbital infection. The present article is about a seemingly trivial pustule on the nose of a child which culminated in superior ophthalmic vein thrombosis after involving and spreading through the orbit. **CASE SUMMARY:** Informant is mother. 9 year old female child presented to our institution with complaints of painful forward protrusion of right eye with drooping of upper eyelid since three days. She had history of boil on the nose one week back following which she developed painful protrusion of Right eye. History of low grade intermittent fever was present. There was no history of preceding trauma or vomiting associated with it, however she had history of dull headache and pain on eye movement was present without diplopia or defective vision. On examination, the child was febrile and sick looking. The dorsum of the nose was swollen and skin was stretched and shiny. Visual acuity measured by a Snellen's chart showed that right eye had an uncorrected acuity of 6/9 with PH 6/6, left eye vision was 6/6. Ocular examination revealed that the right eyelids were swollen and edematous with a complete mechanical ptosis. Superficial dilated and thrombosed vein was noted over the stretched erythematous eyelid skin. (FIG 1,2,3). The child had tenderness over the eyelids, extraocular movements were restricted in all gaze position. Conjunctival injection was present. The cornea was normal. Examination of the anterior segment of the left eye was normal. Pupils in both eyes were equal in size and briskly reacting to both direct and consensual light reflexes. A dilated fundus examination of the right eye showed media was clear, disc hyperemic, margins well defined, veins were dilated and tortuous and macula was normal, there was no conspicuous folds over the retina. Left eye fundus was normal. Clinically we came to the diagnosis of orbital cellulitis with probable association with cavernous sinus thrombosis. Patient was managed intensively with intravenous antibiotics like Injection Cefotaxime 1gm iv bd and Inj Amikacin 80 mg iv bd for 2 weeks, T. brufen 200mg bd, 0.5% moxifloxacin eye drops hourly, lubricating eye drops. Urgent

MRI ORBIT with MR venography was done which revealed orbital cellulitis with superior ophthalmic vein thrombosis with sparing of cavernous sinus (FIG 4,5,6,7). Neurologist opinion was obtained regarding initiation of thrombolytic agents and following their advice she was started on Injection Low Dose Heparin 5000 IU subcutaneously for 2 Weeks and oral Warfarin 2 mg OD for next 2 weeks. Further investigations were requested to look for any systemic involvement. Complete blood counts and electrolyte study were within normal limits. Coagulation profile was within normal limits. Blood culture did not grow any microorganism. After intensive therapy, the child began to show resolution of lid edema and ocular movements returned to normal (Figure 8). She was discharged from the hospital after 20 days of intensive treatment. An MRI taken during her review revealed that there was partial resolution of thrombus in the left superior ophthalmic vein. (Figure 9).

This case report is being published, where the patient presented with isolated superior ophthalmic vein thrombosis with sparing of cavernous sinus thrombosis in orbital cellulitis, a rare association, which emphasizes the importance of detailed history taking along with appropriate investigations and instituting early and appropriate treatment has prevented the involvement of cavernous sinus thereby reducing systemic and ocular morbidity.

DISCUSSION:

Orbital cellulitis refers to any inflammation of the orbital contents behind the septum^{1,2,3}. The etiology is usually spread of infection through the venous stream, direct extension from adjacent sinuses (eg. ethmoid), penetrating injury or rarely, a pyaemic deposit. In children, the causative organisms are usually aerobes. It is a generally a single microbe (eg. Streptococci, Pneumococcus, H. influenzae) in contrast to polymicrobial etiology in adults. A wide spectrum of pathogenic organisms have been implicated, but hemophilus infection is less common following the introduction of a vaccine against *H. influenzae* type b^{3,34}. Abscesses are uncommon associations^{4,5}.

CHANDLER STAGING OF ORBITAL CELLULITIS

Stage 1 Inflammatory, preseptal edema of the eyelids. Orbital signs (proptosis, ophthalmoplegia, visual decline) are *absent*. Eyelid edema results from impaired venous and lymphatic drainage by the infected sinus. 2 Proptosis and limitation of eye movement. Diffuse **postseptal orbital edema** and infiltration by bacterial and inflammatory cells. 3 Defined by the presence of a **subperiosteal abscess** – a collection of fluid or purulent material between the orbital wall and periorbita, resulting in non-axial proptosis. 4 Severe nonaxial or axial proptosis, ophthalmoplegia, and visual decline. **An intraorbital abscess** (within the orbital periorbitum) is present. 5 Bilateral proptosis, severe pain, and signs of **meningeal inflammation**, resulting from extension of the abscess posteriorly and the formation of cavernous sinus thrombosis. Imaging studies like CT & MRI reveal intraconal increase in fat density due to edema and an enhancing capsule in case of an abscess⁶. Treatment is with appropriate antibiotics like cephalosporins, piperacillin & tazobactam, ticarcillin & clavulanic acid and imipenem⁷. The clinician should always watch for signs of systemic complications and should be ready to tackle the same. The urgency of treatment cannot be overstated, as any delay may lead to irreversible visual failure in severe cases. Superior ophthalmic vein thrombosis (SOVT) has been documented very infrequently. The most common setting in which thrombosis of the superior ophthalmic vein (SOV) occurs is when a dural fistula of the cavernous sinus spontaneously closes, other causes include use of oral contraceptives, sinusitis, Tolosa-Hunt syndrome^{8,9,10} and amyloidosis. Infectious SOV thrombosis occurs uncommonly. Because the inferior and superior ophthalmic veins lack valves, such infection may extend to the cavernous sinus and cause secondary thrombosis in this location. Boniuk reported four cases and four additional cases of superior ophthalmic vein thrombosis were reported by Takahashi et al. Venous occlusions in younger patients are commonly associated with various hypercoagulable states leading to thrombosis.

The high prevalence of underlying systemic disease in these young patients necessitates a thorough evaluation to rule out potentially life-threatening embolic and hypercoagulable conditions, thereby minimizing additional systemic and ocular morbidity. Cavernous sinus thrombosis is often due to retrograde spread of infection from the orbit. A few other causes are hypercoagulable states like polycythemia, myeloproliferative disorders and clotting abnormalities^{2,3}. Rarely, direct spread of tumors may be implicated. Clinical features are primarily due to elevated intra cranial pressure. Headache, nausea, increased IOP, papilledema, severe retroorbital pain, congestion of the eye and cranial nerve palsies are observed. These ocular signs may initially be seen in one eye and then spread to the other eye in

the event of bilaterality in cavernous sinus infection. CT and MRI demonstrate an increase in size of superior ophthalmic vein and extra-ocular muscles. Expanded cavernous sinus with hyperdensity (empty delta sign) is the classic sign. There could also be coexisting cerebral infarcts and subdural or intracerebral abscesses

⁶. Treatment is directed at the cause. Antibiotics as mentioned above and, heparin and warfarin are used. If unsuccessful, thrombolysis may be attempted⁷.

REFERENCES

1. Rootman J, Inflammatory Diseases, Diseases of the Orbit: A Multidisciplinary Approach, 2nd ed. 2003 : 455-506
2. Kliegman, Behrman, Jenson, Stanton, Cutaneous Bacterial Infections, Nelson Textbook of Paediatrics, 18th ed. 2007 : 2736-45
3. Cannon ML, Antonio BL, et al., Cavernous sinus thrombosis complicating sinusitis. *Pediatr Crit Care Med*. 2004 Jan ; 5 (1) : 86-8
4. Pavlovich P, Looi A, Rootman J, Septic thrombosis of the cavernous sinus: two different mechanisms. *Orbit* . 2006 Mar ; 25 (1) : 39-43
5. Rohana AR, Rosli MK, et al., Bilateral ophthalmic vein thrombosis secondary to nasal furunculosis, *Orbit*. 2008 ; 27 (3) : 215-7
6. Schuknecht B, Simmen D, Yüksel C, Valavanis A, Tributary venous occlusion and septic cavernous sinus thrombosis: CT and MR findings, *Am J Neuroradiol*. 1998 Apr ; 19 (4) : 617-26
7. Dellinger RP, Levy MM, et al., Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock: 2008, *Crit Care Med*. 2008 Jan ; 36 (1) : 296-327.
8. Berenholz B, Kessler A & Shlomkovitz N (1998): Superior ophthalmic vein thrombosis – complication of ethmoidal rhinosinusitis. *Arch Otolaryngol Head Neck Surg* 1: 95–97.
9. Jaais F, Habib ZA. Unilateral superior ophthalmic vein thrombosis in a user of oral contraceptives. *Med J Malaysia* 1994;49:416–418.
10. Sanchez TG, Cahali MB, Murakami MS, et al. Septic thrombosis of orbital vessels due to cutaneous nasal infection. *Am J Rhinol* 1997;11:429–433

figure 4,5,6,7 FIGURE 8,9 CLINICAL PROFILE FOLLOWING TREATMENT, MRI SHOWING PARTIAL RESOLUTION OF THROMBUS

MRI orbit with brain showing superior ophthalmic vein thrombosis

