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Orbital cellulitis masquerading as Cavernous Sinus Thrombosis: a case report

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Orbital Cellulitis Masquerading as Cavernous Sinus Thrombosis - a Case Report

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Introduction

In developing countries, Orbital Cellulitis is relatively a common pathology seen in ENT clinics and Emergency rooms. Frequency of Orbital Cellulitis is reported to be 21-90%.1 It is seen that 10 % of cases with orbital complication of sinusitis, will have partial or permanent loss of vision which may or may not resolve in 2-6 weeks.2 Another known feature of untreated orbital infection is Cavernous Sinus Thrombosis (CST). Due to modern diagnostic techniques and wide spread use of antibiotics , incidence of Cavernous Sinus Thrombosis is very low . In untreated cases of CST mortality is high. Despite aggressive medical management, complete recovery is rare. Roughly 1/6th of all patients are left with some degree of vision loss and half with cranial nerve deficits.3 This is specially true in under developed countries where patients present late and with full blown disease. Therefore , in our part of the world morbidity and mortality is even higher and disease being more lethal than what is reported in western literature.4

Case Report

A 40 year old man, smoker with no past co-morbids presented to ER with left facial swelling, proptosis of left eye, sudden loss of vision, headache, nausea and low grade fever. Symptoms started 10 days prior with mild headache and otalgia. He was treated with analgesics but symptoms worsened. He was hospitalized in a rural hospital and received intravenous antibiotics of which no record was available. Later he was referred to our tertiary care facility for management of worsening eye symptoms and acute blindness. On arrival he was alert, oriented, vitally stable with mild tachycardia. No prior history of otitis media or sinusitis could be ellicited. On examination he was a well built man with obvious swelling of left face, severe proptosis and chemosis of left eye, left mastoid swelling and left complete ophthalmoplegia involving 3, 4, 6 cranial nerves. With left LMN type of 7th nerve palsy, sensory deficit was noted in distribution of opthalmic division of trigeminal nerve. Patient had conductive hearing loss on left ear with loss of direct and consensual light reflexes in the same eye with dilated and fixed pupil. Visual Acquity was diminished till perception of light with relative afferent pupillary defect. Central perforation and pussy discharge was noted from left ear. Fundoscopy showed pale retina and mild papilledema.

There were no signs of meningeal irritation and rest of the physical examination was unremarkable. WBC count was 19.8 with 88.2 % polys at the time of admission. CT scan showed severe orbital cellulitis with inflammatory changes in ethmoid, spheniod and maxillary sinuses and no evidence of orbital abscess. MRI Post Gadolinium contrast imaging showed same findings with no element of cavernous sinus thrombosis or extension of infection to Brain [Figures 1(a) and 1(b)]. Ophthalmology examination showed severe orbital infection and evidence of endophthalmitis. Patient underwent functional endoscopic sinus surgery on the same day of admission and was started on ceftriaxone and metronidazole inravenously. He was admitted in a special care Unit. Despite administration of broad spectrum antibiotics, pain and swelling of the face increased and WBC counts rose to 25.6 with in 48 hours. Antibiotics were changed to Amikacin, Meropenem and Amphoterecin B. Vancomycin was started later when tissue culture showed moderate growth of Staph epidermidis and fungal cultures were negative. On 9th day of admission patient was stable with falling WBC counts, and no fever. Pain and swelling subsided. He was discharged on oral Clindamycin, Itroconazole and Ciprofloxacin for 14 days . At the time of discharge patient had no vision in left eye.

Discussion

Orbital cellulitis is a well known complication of Para nasal sinusitis.1 Other causes mentioned in literature are Periodontal abscess, Nasolacrimal infections, Trauma, post surgical infections and Rhabdomyosarcomas.. Orbital Cellulitis is divided into five categories which are widely accepted for proper diagnosis and treatment.5

GP 1. Preseptal cellulitis: Infection restricted anteriorly by orbital septum; presents with eyelid swelling and

pain but no ophthalmoplegia.

GP 2. Orbital Cellulitis ; Infection has passed beyond the orbital septum and involved soft tissues of the orbit causing ophthalmoplegia, chemosis, exopthalmos and low visiual acquity.

GP 3. Subperiosteal Abscess: Collection of Pus near lamina papyaracea pushing the Globe to the opposite side. There is vision loss, with proptosis and exophthalmos.

GP 4. Orbital Abscess: Severe exphthalmos, pain fever and loss of vision is present..

GP 5. Cavernous Sinus Thrombosis. End stage of Orbital infection extending to the cranium.

All these entities are classified according to the disease severity but do not necessarily happen in succession.

There is a strong association of Paranasal Sinusitis with orbital infection.6,7 Incidence of concomitant sinusitis with orbital cellulitis is 60 - 72% owing to anatomical proximity.8 The orbit is especially susceptible to infections because of its proximity to the paranasal sinuses and nasolacrimal system and infection may extend to the brain due to the valveless communication of facial and Opthlamic veins to the cavernous sinus.9 Therefore delay in diagnosis and treatment of orbital infection and sinusitis can lead to Cavernous Sinus Thrombosis which can prove to be fatal. Orbital walls near the paranasal sinuses are thin and porous. Lamina papyaracea, the ethmoid sinus and the orbit has a thickness of 0.5 mm.8,9 Ethmoid sinus hence, is the most commonly infected sinus associated with orbital cellulitis.5

Anteriorly, the orbit is limited by the orbital septum which arises from the orbital rim and inserts at the tarsal plate inferiorly and Levator Palpebrae Superioris aponeurosis superiorly. This septum plays a role in limiting the spread of infection to the orbital contents, and provides the basis of distinction between orbital and preorbital cellulitis.

CST and orbital infections have similar clinical symptoms. This is explained by the fact that orbital infection compresses structures that pass via superior orbital fissure which includes CN 3, CN 4, CN 6, branches of ophthalmic division of trigeminal nerve and ophthalmic vein. The same structures lie in close proximity of cavernous sinus Such a full blown pathology is rare and is usually seen in patients presenting late to a health care facility, or have concomitant Diabetes Mellitis or other conditions with significant immunocompromization.

Diagnosis of orbital infections should start with a thorough history and physical Examination. Group 2,3,4,5 (refer to classification of orbital infections) are all associated with sinister spreading orbital infection. All the categories of post septal variety are clinically worrisome, dangerous and require intravenous antiobitics, inpatient care and surgical drainage.

All patients of orbital cellulits should undergo a complete ophthalmological slit lamp examination to rule out endopthalmitis and any other non infectious cause of proptosis. Complete ENT evaluation is important as majority of orbital infections are due to sinus involvement and may be missed causing delay in the treatment7, specially when infection is occult.

Although plain radiographs are widely used to diagnose sinus pathology but their unreliability is stated widely in literature.9 CT scan is considered the modality of choice for diagnosis of orbital infection and its extension into the cranium. It has a good resolution for the orbital soft tissues, and integrity of lamina papyaracea and its involvement by subperiosteal abscess . There is an element of artifact at the apex due to surrounding bony structures .10 Post gadolinium enhanced fat supression MRI is amongst the most sensitive techniques for evaluation of orbital infections.11

Blood cultures and WBC count should be acquired from all the patients. Yield of blood cultures is reported to be between 34-45% . In one other series the yield was found to be 0%.4 This modality is helpful in children as majority of these blood culture positive results are from pediatric population, but its importance remains questionable. Culture yield of surgically acquired tissue specimen is high and those from eyes, nose and conjuntivae are misleading.9

The most common organisms in adults are Strep pneumonie, Staph aureus,and Morexlla catterhalis . Fungal infections occur mostly in immunocompromized patients.4,9 Treatment comprises of broad spectrum antibiotics preferably Penicillinase resistant variety that covers gram positive and gram negative organisms. In children Haemophllis influenzae is the most common pathogen and second generation cephalosporin remain the drug of choice.9

Patients with orbital cellulits should be admitted and and treated with IV antibiotics . Worsening orbital swelling, proptosis, sudden loss of vision and presence of subperiosteal abscess or intraorbital abscess formation require surgical drainage . Hib vaccination is a very important preventive tool. It was reported to coincide with rapid decline of orbital infections in pediatric population.12

Conclusion

Orbital Cellulits is widely associated with sinusitis. It is a disease of children and young adults . It may masquerade as CST and is potentially fatal in untreated patients. As an Emergency Room physician, patients presenting with chemosis, ophthalmoplegia, proptosis and vision loss should be considerd as rhinological and ophthalmological emergencies. CT scan is the investigation of choice due to less cost and wide spread availabilty but MRI is superior in evaluation of soft tissues of the orbit and Cavernous sinus. Treatment should start with intravenous antibiotics and hospitalization. All such patients must undergo rhinological and ophthalmological evaluation. One should keep a low threshold for surgical drainage if patients are poorly responding to the antibiotics. High index of suspicion is needed for the diagnosis of CST as it is rare, but deadly if it sets in .

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