



UNILATERAL CAVERNOUS SINUS THROMBOSIS AS A COMPLICATION OF NASAL FURUNCLE

Ali Abdullah AlShehri^{1*}, Khalid A Alshehri², Abdullah Alhilali²

¹Najran University, Saudi Arabia.

²Assir Central Hospital, Saudi Arabia.

Corresponding Author:- Ali Abdullah AlShehri

E-mail: a.almahlaf@yahoo.com

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ABSTRACT

We present a 33- year old man with one of the most vulnerable complication of mid face infection which is cavernous sinus thrombosis (CST). History and physical examination as well as radiological study reveal cavernous sinus thrombosis but fortunately it was only single side involvement. We present this case because of rarity and fatality of such disorder.

INTRODUCTION

Cavernous sinus thrombosis (CST) was initially described by Bright in 1831 as a complication of epidural and subdural infections. The dural sinuses are grouped into the sagittal, lateral (including the transverse, sigmoid, and petrosal sinuses), and cavernous sinuses. Because of its complex neurovascular anatomic relationship, cavernous sinus thrombosis is the most important of any intracranial septic thrombosis [1].

The cavernous sinuses receive venous blood from the facial veins (via the superior and inferior ophthalmic veins) as well as the sphenoid and middle cerebral veins. They, in turn, empty ultimately into the internal jugular veins and the sigmoid sinuses via the superior petrosal sinuses. This complex web of veins are valveless; blood can flow in any direction. Since the cavernous sinuses receive blood via this distribution, infections of the face especially in danger area zone [2, 3] like our case can spread the infection to this vein complex in Figure 1.

The internal carotid artery with its surrounding sympathetic plexus passes through the cavernous sinus. The third, fourth, and sixth cranial nerves are attached to the lateral wall of the sinus. The ophthalmic and maxillary

divisions of the fifth cranial nerve are embedded in the wall Figure 2.

CASE REPORT

A 33-year-old male with no past medical history presented with a 2-days history of swelling in the left eye. The patient reported having boil in the left side of nasal vestibule which is ruptured with finger tip manipulation . He was seen at a peripheral hospital and was prescribed oral antibiotic with topical cream for nasal infection. The patient reported that the nasal infection did not resolve and his eye swelling getting worse. So, he decided to left against medical advice (LAMA) the hospital. Afterthat , he presented to our hospital via emergency department.

At presentation, the patient's eye was painful, with tearing but no other discharge. He denied any changes in his vision or double vision. He also denied any trauma or insect bites. The patient had no family history of childhood eye diseases.

On ocular examination, the patient's visual acuity was 6/9 in the left eye without his glasses. Visual acuity of his right eye was 6/6 without his glasses at distance. Pupils



were both reactive with no relative afferent pupillary defect. He had a 2+ swelling of the left upper lid, causing ptosis. A left hypotropia and a right exotropia were present.

The patient had mild proptosis of the left eye Figure 3. His eye motility had limitations in all fields of gaze. Examination of the anterior segment was significant for conjunctival chemosis and injection of the left eye at 6 o'clock. Posterior examination was normal in both eyes, with no optic nerve edema.

His lab investigation showed normal values apart from white blood cells which was 22 (normal value: $6-10 \times 10^9 \mu\text{l}$).

Patient admitted to the hospital for further investigation and management. The computed tomography was done and showed ill defined hypodense swelling with proptosis in the left eye globe with no bone defect or clear collection. As clinical suspicion, Magnetic Resonance Imaging (MRI) and Venography (MRV) were done to

assess the cavernous sinus and other intracranial structure. MRI& MRV revealed contrast enhanced T1 weighted MRI demonstrates heterotense mass filling the left eye globe. T2-weighted MRI demonstrates higher than normal signal in left side of cavernous sinus. Contrast-enhanced MRI demonstrate absence of enhancement in the cavernous sinus because of thrombosis. Figure 4

Therefore, Ceftriaxone, Vancomycin, nasal and systemic steroid, normal saline, nasal drops and optical antibiotics with eye care to avoid further corneal injury. Nevertheless, there was only mild improvement regarding eye swelling and ophthalmoplegia over two days. So, Infection Disease team consulted. Then, they added Meropenem instead of vancomycin. Then, patient started to improve dramatically. The course of antibiotics continued for 3 weeks. After 6 months, patient came to the clinic as out-patient follow up with totally cure and without any disease sequela Figure 5.

Fig 1. Danger Zone defined as triangle from corners of mouth till the dorsum of the nose

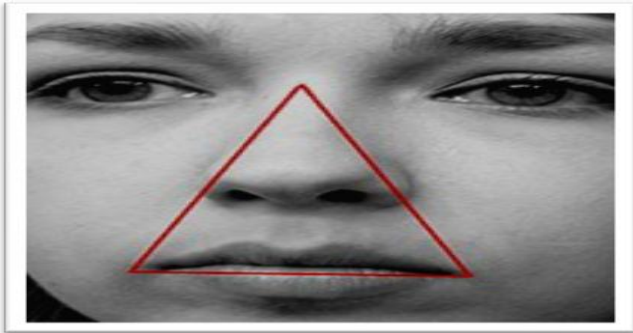


Fig 2. Cavernous sinus and its relationship

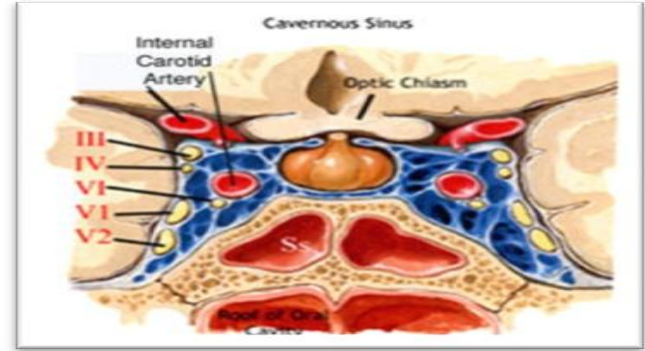


Fig 3. patient at presentation with proptosis and chemosis of left eye



Fig 4. T1- weighted MRI reveals evidence of superior ophthalmic vein thrombophlebitis with proptosis

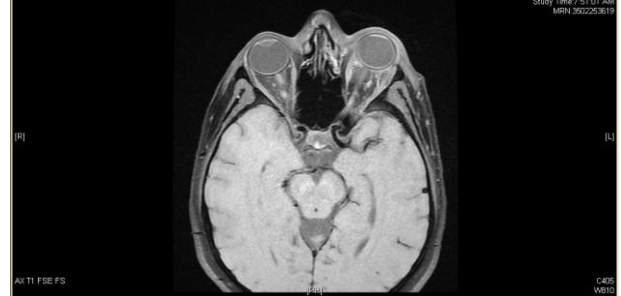


Fig 5. Patient after 6 months improved completely



DISCUSSION AND CONCLUSION

Cavernous sinus thrombosis (CST) is the formation of thrombus within the cavernous sinus, which can be either be septic or aseptic. Septic CST is a rapidly evolving thrombophlebitic process with an infectious origin (typically from the middle third of the face, sinuses, ears, teeth, or mouth), affecting the cavernous sinus and its structures. Aseptic CST is usually a thrombotic process that is a result of trauma, iatrogenic injuries, or prothrombotic conditions [4].

The differential diagnosis of CST includes orbital cellulitis, superior orbital fissure syndrome, orbital apex syndrome, sino-orbital aspergillosis sub-peri-osteal mucocoeles, Tolosa-Hunt's syndrome, meningioma, carotid-cavernous fistula, and rhino-cerebral mucormycosis. The clinical presentation is usually due to the venous obstruction either ophthalmic veins or others as well as impairment of the cranial nerves that at cavernous sinus wall or within the trabecula.

Headache is the most common presentation symptom and usually precedes fevers, periorbital edema, and cranial nerve signs. The headache is usually sharp, increases progressively, and is usually localized to the regions innervated by the ophthalmic and maxillary branches of the trigeminal nerve. The causative agent is generally *Staphylococcus aureus* up to 70%, although streptococci, pneumococci, and fungi may be implicated in rare cases especially in immunocompromised patients.

Whatever the type of CST either septic or aseptic, the mainstay of treatment is aggressive antibiotic which can cross the blood brain barrier such as vancomycin and third generation cephalosporin. As well as anticoagulants [5] and the intravenous corticosteroid [6] have a role in decrease mortality rate. Surgical intervention can be use as part of management especially if the sinus is source of infection. However, a case report and literature review by Naesens *et al* of community-acquired MRSA infections of the central nervous system, including cavernous sinus thrombosis, showed that patients treated with linezolid had a better outcome than those treated with vancomycin [7]. The complications of CST range from residual facial discoloration, extension of infection to intracranium, pituitary dysfunction up to death in 30% of cases. Sanchez *et al* published two cases of superior ophthalmic vein infection due to cutaneous nasal infection which has been managed vigorously with antibiotic Clindamycin and steroid. Although, there was no culture guided only empirical treatment [8].

CONCLUSION

Health education is much important in such case because if we discourage such manipulation in nasal furuncle will not end with such major situation. As well as, with early intervention will avoid a devastating complication.

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