

# Cavernous Sinus Thrombosis: A Case Report

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## ABSTRACT

Cavernous sinus thrombosis or thrombophlebitis is a major life threatening complication of orofacial infections. The diagnosis was based on case history and clinical presentation of the condition. We presented a case of cavernous sinus thrombosis presented with typical features involving the eye with a maxillary tooth as a focus of infection. The patient was treated by aggressive measures which includes supportive therapy along with surgical management.

**Keywords:** Cavernous Sinus; Cavernous Sinus Thrombosis; Cavernous Sinus Thrombophlebitis; Chemosis; Ophthalmoplegia; Ptosis.

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## INTRODUCTION

Cavernous sinus thrombosis or thrombophlebitis (CST) is a major life threatening complication of orofacial infections [1]. We presented a case of cavernous sinus thrombosis presented with typical features of the condition. The diagnosis was based on case history and clinical presentation. The management of patient includes supportive therapy along with surgical management. Aggressive management is advocated to treat this life threatening condition.

## CASE REPORT

A 12 year old female child patient, reported with a chief complaint of pain in the left eyes along with swelling since 10 days. The swelling of the left eye increases rapidly over a period of 10 days to that of present size along with increased redness. The other associated symptoms were fever and severe headache. General physical examination revealed that the patient was markedly ill. The extra-oral examination revealed generalized diffuse swelling (cellulitis) of the left side of the face. An ophthalmologist performed the detailed examination of the eye. Both upper and lower eyelids of the left side were swollen along with ptosis of the upper eyelid. The eyeball is bulging outward i.e. exophthalmos/ proptosis was evident. There is chemosis of the bulbar conjunctiva, dilatation of the pupil along with retinal hem-



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Fig.1: Clinical examination revealed edema of eyelids, ptosis, proptosis, chemosis, retinal hemorrhages, dilatation of pupil, cellulitis of left side of face.

orrhages (Figure.1). The corneal reflex was absent. There is increased lacrimation along with decrease in visual acuity. Complete closure of the eye is not possible because of paresis of extra-ocular muscles. The patient presented with high grade fever (101° F) and increased pulse rate (120 beats per minute). Blood pressure and respiratory rate were within normal limits. Neurosurgical examination of the patient ruled out the presence of the meningitis.

Further questioning from the patient revealed that the patient have a tooth ache in the upper front tooth prior to onset of the symptoms. On examination, oral hygiene of the patient was poor. There were multiple carious teeth in the jaws. The painful tooth in consideration was upper left central incisor with discolored crown and was tender on percussion. Patient was advised blood investigations and OPG radiographic examination. Blood investigations showed increased leucocyte count with relative neutrophilia and elevated erythrocyte sedimentation rate (ESR). Further, blood culturing was advised to identify the pathogenic microorganism along with antibiotic sensitivity testing. OPG examination revealed periapical pathology in relation to upper left central incisor (culprit tooth in consideration) (Figure.2). There was history of trauma 2 years back to this tooth while playing. Trauma to the tooth with subsequent necrosis of pulp and development of periapical pathology was the probable etiology.



Fig.2: OPG examination revealed periapical pathology in relation to left maxillary central incisor (culprit tooth) along with multiple carious teeth.

The condition was diagnosed as cavernous sinus thrombosis based on case history, clinical presentation and routine investigations.

Patient was admitted to the hospital for management. The management protocol includes supportive therapy and surgical management. Supportive therapy includes hydration of the patient with intravenous solution, proper nutrition and administration of antibiotic therapy. Chloramphenicol (1 gram 6 hourly) was administered by intravenous route on empirical basis. As the use of anticoagulant is controversial, we have not used anticoagulant in our case. The dental management includes the access opening preparation in the upper left central incisor to establish decompression of the periapical area. The supportive therapy includes oral hygiene maintenance by frequent irrigation of the root canal along with oral cavity using chlorhexidine (0.2%). Chlorhexidine (0.2%) was further prescribed to patient for regular use 2-3 times per day. Non steroidal anti-inflammatory drugs (NSAIDs) were prescribed to the patient for analgesic and anti-pyretic action. Eye care include use of antibiotic-steroid eye drops, use of lubricants and frequent eye wash using sterile water as per the advice of ophthalmologist.

There was marked improvement in the condition of the patient with a good control of acute toxic symptoms of the disease. As the acute symptoms were under control, it was planned to extract the upper left central incisor under antibiotic cover. The tooth was extracted along with generous curettage to remove the periapical pathology. The socket was irrigated with the betadine solution (5%) and the extraction socket was closed with 3-0 black silk suture.

The blood culture and sensitivity report revealed that the infection is primarily of mixed origin with predominance of streptococci group. The microbial flora was sensitive to amoxicillin and metronidazole commonly used in clinical practice. Based on this report the patient was prescribed tablet augmentin (amoxicillin + clavulanic acid combination) 625 mg twice daily, tablet metronidazole 400 mg thrice daily for next 7 days. Sutures were

removed after 7 days of extraction. The patient was further advised to undergo complete management of other dental diseases to avoid infections in future.

### DISCUSSION

Cavernous sinus thrombosis or thrombophlebitis (CST) is a serious condition characterized by formation of thrombus either in the cavernous sinus or its communicating branches. Infections of the face, head and intra-oral structures especially above the maxilla are more prone to produce CST. The infection can reach the cavernous sinus by two routes. Infections from the face and lips are carried by the facial and angular veins, while pterygoid plexus carried the dental infection. The spread of the infection by the external route via facial vein is rapid with a short fulmination course. The reason for this is that, the veins of the face are of larger diameter and have no valves i.e. open channels. On the other hand, infections spreading via internal route or through pterygoid plexus of veins reaches cavernous sinus after passing through multiple small twisted passages leading to slower course [1]. Our patient presented with rapid onset of the condition in contrast with usual slow presentation in most cases. This can be explained by the fact that the periapical infections from the maxillary central incisors mostly spread through the labial cortex toward the lips or face as the root apex is closer to labial cortical plate.

CST may be caused either by direct extension through the venous system (septic thrombophlebitis) or by spread of infected emboli. The initial symptoms of CST are usually pain in the eyes and tenderness to pressure. The other symptoms of the toxicity include fever with chills, excessive sweating and increased pulse rate. The signs of the venous obstruction are edema of the eyelids, proptosis and chemosis. There may be increased lacrimation and retinal hemorrhage. The involvement of trochlear, oculomotor, abducens, ophthalmic division of the trigeminal nerve and carotid plexus leads to ophthalmoplegia, dilatation of the pupils, ptosis and diminished or absent corneal reflex. In advanced stages there may be development of toxemia and meningitis. If the treatment is not immediately done, the prognosis is usually poor even in the antibiotic era [2].

For management of CST, Chloramphenicol 1 gram 6 hourly by intravenous route is the drug of choice. To identify the causative microorganism the culture can be taken from the source of infection or by the blood culture. Also, culturing will help in determining the antibiotic sensitivity of the causative microorganisms. Various authors have reported streptococci, staphylococci and gram negative microbes to be involved in the pathogenesis of CST [2]. We have used chloramphenicol for empirical therapy and shifted the patient to definite therapy (augmentin and metronidazole) based on the reports of blood culture and sensitivity testing.

Some authors advocated the use of anticoagulants to prevent venous thrombosis. However, the efficacy of this treatment is not well established. There are few authors who argued

against the use of anticoagulants and stated that its use can aggravate the hemorrhagic lesions in the brain and once the condition is established such drugs are useless [2]. As the use of anticoagulant is controversial, we have not used anticoagulant in our case.

### CONCLUSION

Cavernous sinus thrombosis or thrombophlebitis (CST) is a life threatening condition which can lead to fatal outcomes. The comprehensive management of the patient includes a collective team work of oral surgeon, neurosurgeon and ophthalmologist for diagnosis as well as the management of the condition. The management of CST should be aggressive and include both supportive and surgical therapy.

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