



Cavernous Sinus Thrombosis Caused By a Dental Infection: A Rare Case Report

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Abstract

Cavernous sinus thrombosis not only presents with constitutional symptoms including fever, pain and swelling but also with specific findings such as proptosis, chemosis, periorbital swelling, and cranial nerve palsies. It is known to occur secondary to the spread of paranasal sinus infections in the nose, ethmoidal and sphenoidal sinuses. However, paranasal sinus infection of dental origin is rare. Dental infections are not common sources of CST. There are very few reports of CST related to periapical infection, periodontal disease or tooth extraction in the literature.

The following is a case report that highlights the treatment done for a 46 year old female diagnosed as cavernous sinus thrombosis due to the spread of an abscess involving right side maxillary sinus, ethmoid bone and also the extraocular muscle with severe pain and swelling that originated from a periapical infection of upper right premolar tooth.

Keywords: Cavernous sinus thrombosis, proptosis, chemosis, ethmoidal and sphenoidal sinuses.

Introduction

Cavernous sinus thrombosis (CST) was first described by Bright in 1831 as a complication of epidural and subdural contamination¹. As a result of its intricate neurovascular anatomic relationship, CST is the most complicated type of intracranial septic thrombosis².

Cavernous sinus thrombosis (CST) is an uncommon, but potentially fatal complication of infections of paranasal sinuses, maxillary dentition and soft tissue involving midface and orbital region. Due to the proximity of cavernous sinus with multiple valveless venous communications between the two, allows for direct extension or embolic spread of sepsis to the cavernous sinus that results in thrombophlebitis of cavernous sinus is manifested by features of obstructed venous drainage and neurologic signs due to involvement of cranial nerves III, IV, V, VI and then it progresses through the anterior and posterior intercavernous sinuses. The onset, progress and presentation of this condition may be variable and both subacute and fulminant presentations have been described.³

Case Report

A 46 year old female patient reported to the department of Oral and Maxillofacial Surgery with the complain of tooth-ache, sudden onset of swelling of right cheek since 3 days along with fever, trismus and inability to open right eye since 3 days.

Patient also gave history of attempted RCT and access opening done 3 days back as a result of excessive pain in upper right first premolar tooth. Clinically swelling was tender, fluctuant and extended from superiorly from upper right eye lid, infra orbital region inferiorly till the commissure of the lip, posteriorly till the tragus and anteriorly till the lateral wall of the external nose and redness over the swelling with an extraoral draining sinus also there was loss of voluntary movement of the right eye. (Figure-1A)



Figure-1A Profile view, B-IOPA showing radiolucency wrt 14

The patient was afebrile (98.4 degree F) when reported and haemogram showed leukocytosis (Total count 15,500/mm³, polymorphs-80% and many band cells).

Medical history was unremarkable. Intra-oral examination and IOPA suggested carious upper first premolar on the right side to be the possible focus of infection. (Figure-1B)

Patients blood sugar level was raised upto 400mg/dl.

A diagnosis of suspected fungal infection was made, the patient was hospitalized and empirically administered Inj. Amphotericin B 50 mg, Inj. Teicoplanin 400 mg, Inj. Meropenam and Inj. Clexane, Inj. Insulin was started on sliding scale.

The contrast MRI scan orbit showed right side ethmoid and maxillary sinusitis along with thickening and edema of the extraocular muscles suggestive of endophthalmitis. Loss of flow and enhancement in right superior ophthalmic vein suggestive of cavernous venous thrombosis. MRI PNS contrast showed the lesion involving the intra conal region causing deformity in posterior inferior margin of the right globe. Infiltration into the ocular muscles and also compression of the optic nerve is seen. (Figure-2A,B,C,D)

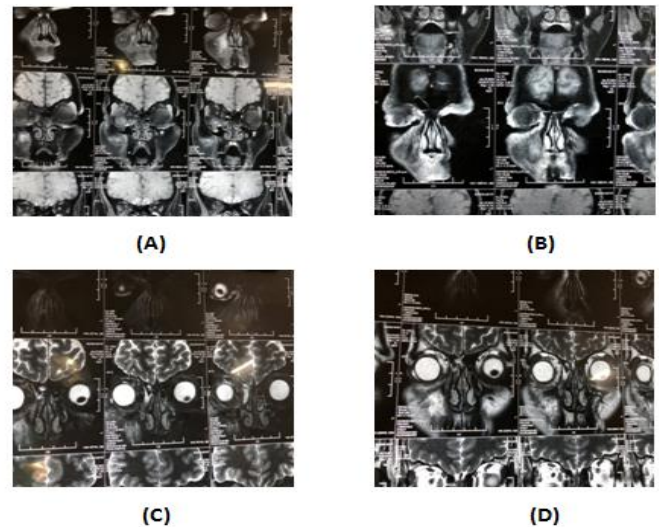


Figure-2A,B,C,D Contrast CT Scans and MRI showing right maxillary sinusitis and involvement of right extraocular muscles

Patient was orally intubated and under general anesthesia and incision was given lateral to the nose extending superiorly from the medial canthus of the eye and inferiorly extended till the ala of the nose for adequate exploration, drainage and debridement. The extensive necrosed fascia was debrided to reach the nasal bones. With the help of peizo, lateral nasal bone was punctured and the septas were broken to curette out the necrosed bone. A triangular shaped anterior antral wall was removed to debride the maxillary sinus. With the help of endoscope necrotic ethmoid bone, part of sphenoid bone was curetted and drained. The extraction of first premolar was also done as it was the foci of infection. Closure was

performed over drains and B-dine gauze was packed and was suspended through the extraoral pus draining site. (Figure 3 a-n).



Figure 3a-n Intra-operative procedure

The patient was kept under antibiotic coverage and regular follow ups that shows progressive reduction in swelling, pus discharge and remission of fever was observed over next three days.(Figure 4)



Figure- 4A First week follow-up



Figure- 4B Second week follow-up



Figure- 4C one month follows up

No treatment was done for loss of voluntary control of eye. Ophthalmologic evaluation showed permanent loss of vision of right eye.(Figure-5).



Figure- 5:Showing permanent loss of voluntary movements of right eye and loss of vision

Granulation of the draining site occurred in regular follow ups and thorough betadine irrigation was also done. Patient is kept under follow up and will be planned for prosthetic rehabilitation if required.

Discussion

The infections of the dangerous facial triangle lead to the origin of infections of cavernous sinus thrombosis. The cavernous sinus thrombosis resulted in 100% mortality before the availability of antibiotics. The passageway to CST is interconnected channels that connects each other. Dental infection related CST is an uncommon clinical event and difficult to diagnose which may be fatal due to its aggressive nature.^{4,5}

In our treatment the prolonged use of anticoagulants and antibiotics proved to be a safer option. Patients with CST often present with fever, headache, proptosis, conjunctival edema, ophthalmoparesis, and numbness of the V1 or V2 division of the fifth cranial nerve. The sixth nerve will commonly be involved first, because it is located in the center of the CS.⁶

The use of anticoagulant for CST proved to be controversial but combining with the treatment reduces the morbidity.⁷ To prevent the spread of thrombosis to the other cavernous sinus as well as to the inferior and superior petrosal sinuses, heparin should be introduced as early as possible. The use of heparin is disputable, as retrospective studies show conflicting data. The decision

to use heparin should be based on thorough consultation with a specialist⁸

Conclusion

CST can be fatal and requires early diagnosis and proper treatment. Even after treatment, cranial nerve dysfunction may remain and intra-cavernous aneurysm may also occur and therefore, long-term follow-up is required. Oral and Maxillofacial Surgeons should be aware of CST and should consider it in patients with facial swelling.

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