

CAVERNOUS SINUS THROMBOSIS AS A FATAL COMPLICATION OF A DENTAL ABSCESS: A CASE REPORT

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ABSTRACT

Intracranial complications of dental abscesses are very rare, but could be fatal. The prognosis from this condition has improved with the advent of antibiotics. Here we present a case of cavernous sinus thrombosis as a complication of a dental abscess in a seven-year-old Liberian male child. The child presented with fever, inability to walk, severe bilateral exophthalmos, ophthalmoplegia, chemosis, proptosis, neck rigidity, reduced level of consciousness, and facial swelling with a history of a dental abscess of one-week duration. Cavernous sinus thrombosis was diagnosed clinically. A heavy dose of antibiotics was started immediately, in addition to steroids and anticoagulants. Unfortunately, the patient died a few days later. In this report we wish to stress the seriousness of the intracranial complications of dental abscesses and to familiarize dentists with the clinical picture of this life threatening condition.

Key words: Cavernous sinus, Complication, Dental abscess

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Introduction

Cavernous sinus thrombosis (or cavernous sinus thrombophlebitis), which was first described by Dease in 1778,⁽¹⁾ is a rare, potentially fatal complication of dental infections, orbital cellulitis, and sinusitis. Its treatment is controversial. It was frequently encountered in the preantibiotic era, but it has become rare after the advent of antibiotics and their widespread use in oropharyngeal infections.^(1,2)

The outcome is fatal in 20-34% of patients, and despite adequate intensive care, 23-86% of survivors remain with residual sequelae including cranial nerve lesions, hemiparesis, weakness of the extraocular muscles, impaired vision or blindness and hypopituitarism.^(2,3,4-8)

Here we report a case of cavernous sinus thrombosis secondary to dental infection with fatal

outcome. We would like to familiarize clinicians with the clinical features of this condition and to emphasize its seriousness.

Case Report

A seven year old, previously healthy, Liberian boy presented to the emergency room at the Jordanian Level-III Hospital in Monrovia which is working with the United Nations Mission in Liberia (UNMIL). He complained of fever, bilateral bulging eyes, inability to walk and loss of vision for three days. The parents gave a history of a dental abscess one week ago, that was treated by oral antibiotics (Ampicillin 250mg and Metronidazole 125mg tds) and analgesic/antipyretics (Paracetamol 250mg).

Physical examination of the child at the time of

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Fig. 1. Lateral view photograph showing severe exophthalmos at time of presentation



Fig. 2. Anterior view photograph showing the ophthalmic derangement and the right facial swelling at time of presentation.



Fig. 3. Intra-oral view photograph showing the dental abscesses at time of presentation and before extraction of the infected teeth and drainage of the abscesses

arrival revealed reduced level of consciousness. The patient was irritable, pale, and feverish (axillary temperature of 38⁰C), with a pulse rate of 80/minute. Head and neck examination revealed severe bilateral exophthalmos, chemosis, proptosis, multiple lymph node enlargement (especially the right submandibular lymph nodes), severe neck rigidity and facial swelling (Fig. 1 & 2).

Intra-oral examination revealed right maxillary dental abscess related to the deciduous molars, which were badly destroyed. In addition, there was a right mandibular dental abscess related to the deciduous first molar (Fig. 3). Central nervous system examination revealed bilateral dilated pupils, sluggish reaction to light in the right eye, while the left was reactive to light. Other cranial nerves were grossly intact, but there were decreased power tone reflexes and positive meningeal signs (neck rigidity, Brudzinksi and Kernig signs). Other neurological examinations could not be undertaken because the child was semiconscious and irritable.

Chest, heart, and abdomen findings were non-

contributory. The available laboratory tests revealed the following results: WBC: 8500/mm³, PCV: 25%, ESR: 85mm/hr, Malaria test negative. Electrolytes were: Na 132meq/l, K 4.2meq/l, Urea 35mg/dl, Creatinine 1.1mg/dl, Glucose 60 mg/dl. Neither Computed Tomography scan nor Magnetic Resonance Imaging was available in Liberia. The diagnosis of cavernous sinus thrombosis was made based on the clinical findings.

For immediate management, the patient received intravenous fluids (500cc glucose/saline), antibiotics (ceftazidime 1gm and metronidazole 200mg) and dexamethasone (2mg) intravenously. Drainage of the dental abscess and extraction of the right deciduous molars were done and the patient was transferred to the intensive care at the Red Cross Hospital (a civilian hospital supported by the International Red Cross working in the same complex with the Jordanian Hospital). The patient was followed up during the course of receiving the antibiotics and dexamethasone and an anticoagulant was added in the form of heparin 1000 unit initial dose and maintained on 1000 unit every four hours.

Unfortunately the child's condition deteriorated rapidly and he died on the fourth day after admission.

Discussion

Cavernous sinus thrombosis is a rare but potentially fatal complication of dental infections, sinusitis, and orbital cellulitis.⁽⁹⁻¹¹⁾ The most common causes of cavernous sinus thrombosis are infections of sphenoid and ethmoid sinuses, followed by otitis media and maxillary dental infections. In the literature dental infections were reported as a cause of cavernous sinus thrombosis in 10% of cases.⁽⁵⁾ Direct spread of infection via the pterygoid venous plexus is most common with dental infections, where the direct extension of an infected thrombus or dissemination of septic emboli may occur.⁽³⁾ In this patient no other cause could be found for the condition other than the dental abscesses in the upper and lower jaws.

The patient presented at our hospital with the typical manifestations of cavernous sinus thrombosis, that included bilateral exophthalmos, ophthalmoplegia, proptosis, chemosis, sluggish pupils, cranial nerves palsies (II, III and IV cranial nerves) and neck rigidity.

The presentation of bilateral proptosis of the eyes is pathognomic for cavernous sinus thrombosis.^(3,5,6,10) The cranial nerve palsies are explained by the anatomical course of these nerves as they pass through and in vicinity of the cavernous sinus, and this can result in compression of the third, fourth, and sixth cranial nerves.⁽⁶⁾ Despite the absence of the Computed Tomography scan and Magnetic Resonance Imaging which are necessary for confirmation of the diagnosis, cavernous sinus thrombosis was the most likely diagnosis with this clinical presentation, although other pathologies (e.g. carotid artery aneurysm, exophthalmic goiter, and some neoplasms) can give a similar picture.

Treatment of cavernous sinus thrombosis should start with high dose antibiotics. Intravenous high dose penicillin and chloramphenicol are the first choice of antibiotics. Pituitary inflammation at autopsy suggested the use of steroids to control adrenal insufficiency and vascular collapse, while others did not recommend the use of steroids. Use of anticoagulants is still controversial, some authors believe they will prevent the propagation of the clot, others think that the clot confines the bacterial spread via septic emboli. One study suggested that heparin use in conjunction with antibiotics early in

the course (i.e. within seven days of hospitalization) may reduce morbidity but there is no conclusive evidence that it reduces mortality. Also, the complications of anticoagulant therapy must be considered.^(1,10,11)

The patient received the standard regimen of treatment that included strong intravenous antibiotics, steroids, and anticoagulant, in addition to the surgical draining of the abscesses. Despite the debate about the role of steroids and anticoagulation therapy in cavernous sinus thrombosis,⁽³⁾ we included them in our regimen to provide this unlucky child with every possible hope for survival.

The mortality rate from this condition is still very high, as reported in the literature, and ranges from 20 to 34% when compared to the preantibiotic era where it was 100%.^(6,7) For the survivors a permanent deficit is reported in 23-86%, including blindness, nerve palsy, coma, or other neurological abnormalities.^(2-4,6,8)

In previous studies microorganisms have been isolated from septic cavernous sinus thrombosis; in two thirds of cases *Staphylococcus aureus* was found followed by *Pneumococci*, *Streptococci*, gram-negative bacteria and anaerobes.^(2,9) In this case, laboratory facilities were not available in Liberia to perform a culture or any other bacteriological test to identify the specific causative microorganism.

Conclusion

Although cavernous sinus thrombosis is quite rare, dentists should become familiar with this potentially life-threatening complication of dental abscess.

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