



ORIGINAL RESEARCH PAPER

Otolaryngology

OSTEOMYELITIS OF TEMPORAL BONE: A CASE REPORT

KEY WORDS: Osteomyelitis, Craniofacial Infection, Frontotemporal Bone, dental Caries

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ABSTRACT

Skull-based osteomyelitis, which is a true bony infection, originates from a chronic and inadequately treated infection. Because of the complex craniofacial skeletal anatomy and associated aesthetic concerns, osteomyelitis of the craniofacial skeleton must be uniquely managed and is more difficult to treat than osteomyelitis of other bones of the body. From the tertiary health care center of Guahati Medical College we report a case of 51 yrs male presenting with right sided painful scalp swelling and tooth infection which is a cytologically and radiologically proven case of osteomyelitis of temporal bone.

INTRODUCTION

Osteomyelitis is defined as an inflammatory condition of the bone that commences as an infection of the medullary cavity, rapidly involving the Haversian systems, and eventually involving the periosteum of the infected areas.¹ Invasion of bacteria into the cancellous bone results in compression of the blood vessels secondary to inflammation and edema of the marrow space. Compromise of blood supply results in the development of ischemic and necrotic bone.⁴ Immobility of the stagnant blood serves a critical nidus for development of infection.⁴ Etiology may result from trauma, bone surgery, bacteremia, or infectious focus and is further influenced by diseases that affect the vascularity of bone, as well as by systemic diseases producing an alteration of host defenses.¹ Anatomically, the bones involved are the mandible, frontal bone, maxilla, nasal, temporal bone, and skull base bones.¹

Osteomyelitis is an opportunistic infection that usually complicates some other condition rendering the host susceptible to disease.⁶ In tooth-bearing bone, osteomyelitis is caused *Peptostreptococcus*, *Bacteroides*, and *Streptococcus* spp., *Arachnia*, *Klebsiella*, mycobacterium tuberculosis, and *Eikenella* spp. Fungal organisms, such as *Aspergillus*, *Candida parapsilosis* also have been reported.⁶

Acute osteomyelitis may present as routine infection with signs including fever, pain, malaise, and facial cellulitis.⁶ There may not be any associated noticeable radiographic changes. It may take up to 10 - 12 days for bone loss to be apparent radiographically.⁴ Acute osteomyelitis may be primarily managed with antibiotics. The underlying predisposing factors or conditions must be adequately treated. The antibiotic of choice is clindamycin because of its effectiveness against streptococci and anaerobes that are usually found with osteomyelitis.⁴ Hospitalization may be necessary for treatment with intravenous antibiotics. Surgical treatment is usually focused on debridement of the involved soft tissue and affected bone any infected teeth or loose bone must be removed.

CLASSIFICATION

Waldvogel classification. Based on the physiopathology, infections are classified into three groups: hematogenous osteomyelitis; osteomyelitis secondary to a contiguous focus of infection; and osteomyelitis associated with peripheral vascular insufficiency. Based on the length of evolution, the infections are classified as acute osteomyelitis and chronic osteomyelitis (recurrences).

Cierny and Mader classification. In this classification, osteo-

myelitis is divided according to bone anatomy and physiological factors of the host. The authors describe four anatomical stages, according to the bone involvement, and three types of host, depending on the patient's clinical conditions. It was developed mainly for infections in long bones.

CASE REPORT

A 51 yr male patient presented to the Guahati Medical College with a complaint of left side scalp swelling with headache since 5 months. He also gave a history of difficulty in opening the mouth since 3 months. The patient gives a history that the swelling in his left temporal region started as small swelling 5 months back and gradually progressed to the present size. It has been associated with headache on his left side which is dull aching and continuous nature with no diurnal variation, relieved only on medication. The patient gives no history of injury to the scalp or any form of skin infection in the scalp. No history of any ear discharge or ear pain. The patient is a known case of diabetes mellitus on medication for 16 years.

Clinical examination: On clinical examination the patient had a soft fluctuant swelling of 4*2cm in the left frontotemporal region. The skin over the swelling was erythematous and tender, with grade II trismus and carries tooth in his left upper jaw. Aspiration approximately 5ml of pus was aspirated out from the site and sent for cytological examination. The patient was oriented to time place and person but was drowsy. All cranial nerve examinations were normal. On otoscopic and audiological examination both the ears were found to be normal. Vision was normal. Blood parameters were within normal limit except RBS which was raised even with medication. Radiological examination (CECT brain) revealed a subgaleal abscess in the temporal region with bony erosion with soft tissue swelling extending to supra zygomatic and masticator space. There was no neurological deficit on CT scan. Dental examination revealed dental infection, periodontal erosion, caries in multiple teeth. Cytological examination confirmed it to be an osteomyelitis.

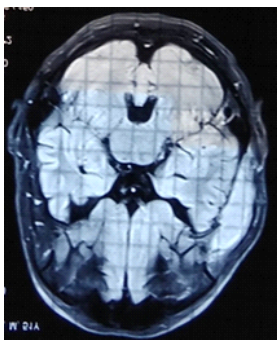
We have kept the patient on antibiotic coverage for 4 weeks and have controlled the glycemic index with insulin. After 4 weeks of treatment the swelling as decreased in size the patient had clinically improved. The infected tooth was removed. A CT scan of the brain was done again at the end of 4th week and it showed resolution of the abscess and soft tissue swelling with irregularity noted on the frontal bone. Patient was discharged on antibiotic coverage and advised a strict glycemic control and regular follow-up.



PIC: showing the left temporal swelling



PIC: showing the left tooth infection and trismus



PIC: showing the subgaleal abscess

DISCUSSION

Celcius, in the 1st century AD, described scraping away or debridement of the dead bone until it bleeds.² Early treatment of osteomyelitis of the long bones was subsequently amputation.² During World War I, Carel and Dakin used continuous irrigation to treat open fractures in soldiers.³ After this period, Orr and Trueta recognized the importance of debridement of the sequestrum, stabilization of the bone, and maintaining the open wound.³ As described by Rowlands et al, skull-based osteomyelitis secondary to pseudomonal infection presents in the elderly diabetic population as a severe unrelenting otitis externa progressing to the development of a unilateral facial nerve palsy, hearing loss, and progressively lower cranial nerve palsies.¹⁰ Loss of the lower cranial nerves is also known as jugular foramen syndrome.¹⁰ Jugular foramen syndrome described by development of multiple lower nerve palsy occurring when skull-based osteomyelitis involves jugular foramen.¹⁰ This usually indicates poor prognosis. Ng et al describe a case of a 10-year-old immunocompetent patient developing a lateral medullary syndrome secondary to streptococcal milleri sphenoidal osteomyelitis.¹¹ Symptoms initially included headache and chronic sinusitis, headache may be the only clinical symptom, with cranial neuropathies occurring later, thereby making early diagnosis difficult. In this case study, a 10-year-old immunocompetent girl developed lateral medu-

llary syndrome (LMS) secondary to chronic sphenoid sinusitis.¹¹ Subburaman and Chaurasia stated that skull base osteomyelitis is a known complication of malignant external otitis (MEO).¹² MEO arises in elderly diabetic patients with an inflamed ear canal and granulations with or without facial weakness.¹² In some cases, involvement of the facial nerve and occasional radiologic findings of a mass, MEO can mimic malignancy. Central skull base osteomyelitis has been described as occurring in the absence of otitis externa. Chang et al described series of patients who presented with cranial neuropathy and headache without any external ear pain.¹³ These atypical presentations arise from the occipital or sphenoid bones as opposed to the temporal bone seen in cases associated with otitis externa.¹³ These cases occur less frequently and usually present only with headache.¹³ Gram-positive organisms are common with these infections, including underlying fungal infections of the sinuses with *Aspergillus*, mucormycosis.¹³ This in contrast with the *Pseudomonas* infections as seen in skull base osteomyelitis associated with otitis externa. In these atypical cases, imaging is best accomplished using MRI.¹³ Diagnosed by tissue sampling using CT-guided fine-needle aspiration (FNA) Several serious complications have been described in the literature occurring from skull base osteomyelitis, including cranial neuropathy, soft tissue involvement of the cavernous sinus with or without cavernous sinus thrombosis, and meningeal or brain parenchymal extension.¹³

CONCLUSION

Osteomyelitis of the craniofacial skeleton is a complex problem requiring rapid and thorough diagnosis and treatment. Failure to do so can result in a host of complications and consequences. The cause of this disease is multifactorial and its presentation varies. Whatever the cause may be, complete resolution of the infection must be obtained to decrease the morbidity and mortality of the patient.

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