

## CASE REPORT



## Chronic suppurative osteomyelitis: A case report

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### Keywords

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### Abstract

The term osteomyelitis encompasses a wide group of infectious diseases involving the disease of the bone and/or bone marrow further extending to periosteum. It is a disturbing disease and involves a series of causative host and pathogen factors. The primary cause of this disease is usually taught to be microbiological especially *Staphylococcus aureus* and *Staphylococcus epidermis*. The diagnosis of osteomyelitis is strenuous, mainly in the early stages, and this disease is at all times complex to treat. Eradicating microorganisms and recuperating circulation in the regions involved, in the early stages have been the mainly employed treatment modalities. The case presented here is of chronic osteomyelitis with an extraoral draining sinus. Surgical debridement and oral antibiotics were considered as the treatment of choice.

### Introduction

Osteomyelitis known since yesteryear was first described in 1852 by Chassaignac. "Osteomyelitis" is derived from the prehistoric Greek words osteon meaning bone and muelinos meaning marrow.<sup>[1]</sup> Osteomyelitis of jaws is a common disease but dreadful due to its need for prolonged therapy, which sometimes results in disfigurement and dysfunction of the affected area.<sup>[2]</sup> In the recent past, the occurrence of osteomyelitis of the jaws has declined because of the availability of newer antimicrobial agents and also improved dental care. Improper use of antibiotics, poor oral hygiene maintenance, malnutrition, emerging strains of resistant microorganisms to certain antibiotics, and radiation therapy are the main causes that can be attributed to increasing cases of osteomyelitis across the globe. Some other factors that also predispose an individual to osteomyelitis of jaw is virulence of the microorganism, compromised vascular intriguing and perfusion in the host bone at the local, regional or systemic level, and environment distressing host resistance or defense.<sup>[2,3]</sup>

### Case Report

A 22-years-old male patient reported to the Department of Oral Medicine and Radiology, with a complaint of pus draining from his lower left jaw region [Figure 1a and b]. The patient gave a history of pain present with respect to his lower left back tooth

region since 10 months. The pain was sudden in onset, rapid in progression which was sharp, intermittent in nature that partially subsided on application of clove oil followed by subsequent self-medication with analgesics which provided him symptomatic relief. The patient later was asymptomatic for 6 months. 3 months ago patient observed an extraoral swelling on the left middle, third of the face along with sharp severe shooting pain which lasted for 3 days for which he self-medicated with antibiotics for 3 days and was symptom-free post the medications. 1 month ago patient observed a reddened area on the left lower border of the mandible with dull intermittent pain followed by pus discharge. The patient then presented to our department for treatment of this condition.

A thorough general physical examination was performed with no significant abnormalities observed. The vitals were checked and were observed to be within normal limits.

On extra oral examination, patient had no gross facial asymmetry and no signs of swelling were present. There was the presence of an extraoral draining sinus on the left parasymphysis region 1 cm below the inferior border of the mandible with pinpoint bleeding areas with no signs of tenderness and paresthesia [Figure 2].

On intraoral examination, there was the presence of grossly decayed carious teeth with respect to 36 and 37 with no signs of mobility but tender on percussion. Soft tissue examination reveals no signs of erythema, edema or vestibular swelling, but

there was tenderness on the buccal vestibule with respect to 36 and 37 region on palpation [Figure 3].

The other intraoral findings included grossly destructed carious teeth with respect to 26, 36 and missing teeth with respect to all the 4 s premolars.

Based on the history and clinical findings a provisional diagnosis of the Chronic alveolar abscess with respect to 36, 37 was arrived. The clinical differential diagnosis was thought to be chronic suppurative osteomyelitis, cervicofacial actinomycosis.

Pre-operative routine investigations were performed. The patient was subjected to a panoramic radiograph, which revealed ill-defined radiolucent areas arising from the apex of the distal root of 36 superiorly and extending inferiorly up to the inferior alveolar nerve canal. Mediolaterally, ill-defined radiolucency is seen extending from distal aspect of 34 to distal aspect of 37 with interspersed radiopaque mass adjacent to distal aspect of 36 suggestive of sequestrum formation [Figure 4].

A diagnosis of chronic suppurative osteomyelitis was derived based on clinical and radiographic manifestation.

The treatment planned initially included administration of amoxicillin 500 mg orally for 2 days preceding surgery followed by surgical drainage and curettage of the area involved. Post the surgery the patient was put on amoxicillin 500 mg orally thrice

daily and metronidazole 400 mg orally thrice a day for 5 days along with analgesics. Postoperatively, the patient was followed up for 1 month. The wound healing was uneventful with the absence of post-operative complications.

## Discussion

Chronic osteomyelitis is a bone infection that is branded as inflammatory processes that results in destruction of bone.<sup>[1,2]</sup> The principal reason of chronic osteomyelitis is frequently microbiological odontogenic infection, complications post extraction, unsatisfactory amputation of necrotic bone, early cessation of antibiotic therapy, inappropriate choice of antibiotics, poor diagnosis of the condition, trauma, and insufficient management for fracture or irradiation to the mandible.<sup>[3,4]</sup> Possible cause of disease, in this case, was odontogenic infection in relation to the left lower molar teeth.

The various sources of infections that could lead to osteomyelitis are:

1. Osteomyelitis caused secondary to infection or trauma



**Figure 1:** (a and b) Patients extra oral profile picture



**Figure 2:** (a and b) Extra oral draining sinus present on the lower left inferior border of mandible



**Figure 3:** Intra oral picture showing grossly destructed teeth wrt 36, 37



**Figure 4:** An orthopantompograph showing diffused radiolucency involving the apices of 36, 37 regions with the presence of sequestrum formation

2. Osteomyelitis caused secondary to infection caused due to vascular insufficiency
3. Osteomyelitis caused due to hematogenous spread of infection
4. Osteomyelitis caused due to radiation therapy.

Initially, the infection involves the mineralized marrow tissues that promote suppurative infection, hyperplasia, and resorption.<sup>[2-4]</sup> The disease becomes established in the calcified portion of the bone when pus in the medullary cavity or beneath the periosteum leads to impediment of blood supply. The necrosis ensues once ischemia sets in. Tissue necrosis entails as proteolytic enzymes are liberated with the destruction of bacteria along with vascular thrombosis and ischemia. When pus accumulates, intramedullary pressure increases, resulting in vascular collapse, venous stasis, and further ischemia.<sup>[4,5]</sup> Pus accumulating underneath the periosteum elevates it from the cortex and thus further reduces the vascular supply.<sup>[6]</sup> As this continues to accumulate, the periosteum is breached followed by the development of mucosal or cutaneous abscesses and fistulae.<sup>[7]</sup>

Osteomyelitis of the mandible is more common than because blood supply to maxilla is far more extensive. Besides infection, compromise of the blood supply is a decisive factor in the establishment of osteomyelitis, so osteomyelitis occurs more commonly in the mandible than in the maxilla since mandible is dense, poorly vascularized cortical plates, and dependent on the sole blood supply from the neurovascular bundle of inferior alveolar system.<sup>[5,7,8]</sup>

In its acute stage, suppurative osteomyelitis of the mandible is usually characterized by deep-seated intense pain, high intermittent fever, paresthesia of the mental nerve, and a clearly identifiable cause. In established suppurative osteomyelitis, clinical symptoms include pain, fever, and constitutional symptoms. Immediate aggressive antibiotic therapy may prevent progression to the periosteum.<sup>[8,9]</sup> Within 2 weeks from the time of its onset, the involved teeth tend to be mobile and become highly sensitive to percussion. Pus exudes in the region of the gingival sulcus and then destroys mucosal and cutaneous barriers resulting in fistulae. Clinical findings in chronic mandibular osteomyelitis are lokoregional pain, fever, swelling, discharge with purulent content, intra- and extra-oral fistula, and trismus. Sometimes they also present with neuropalsy, pathological fracture. Our patient reported to us with dull aching pain with extraoral draining sinus in the left side of the mandible.<sup>[2,5,9]</sup>

The radiologic examination generally presents with radiolucent areas, bony destruction and sequestrum formation. The distinctive features of osteomyelitis are the occurrence of sequestra and laminations of periosteal newly formed bone. Positive radiographic observation is commonly not prompt but secondary, except in cases with an associated fracture. In this case, there was evidence of ill-defined radiolucency along with the presence of sequestrum formation.<sup>[3,10]</sup>

The various other investigatory procedures that could be incorporated in such cases CT and bone scintigraphy.<sup>[2,3]</sup> The obtained specimens of the soft tissue and bone post the surgery

must also and always be sent to the microbiology laboratory for detection of specific microorganisms.<sup>[6]</sup> Histopathologically shows an amplified quantity of osteoblasts, thick trabecula of bone, and fibrous tissue substitute in the marrow spaces with pathologic bone remodeling and the existence of numerous chronic inflammatory cells.<sup>[11]</sup>

According to Chihara *et al.*, the remission of the disease which is defined "as the absence of any sign of infection in the initial or contiguous location at least 1 year after the end of microbial therapy" is the primary goal of treatment.<sup>[1,12]</sup> The varied pathogenesis of osteomyelitis mandates specific treatment strategies which focus on eradicating the infection along with preserving the integrity and function of the bone involved.<sup>[12]</sup>

Early antibiotic treatment before widespread destruction produces the best prognostic results. The antibiotic to be administered is dependent on the causal pathogen and its pattern of susceptibility. Intravenous or oral administration of antibiotics for 4 weeks is the most commonly employed treatment plan in cases of acute osteomyelitis. The drugs commonly used are beta-lactams, penicillin derivative, fluoroquinolones, rifampicin, and glycopeptides.<sup>[12,13]</sup>

Radiation induces tissue hypoxia, hypocellularity, and hypovascularity within normal cells resulting in loss of balance resulting in cell death and collagen lysis that surpass the homeostatic mechanisms consequential in osteoradionecrosis. This condition is treated with hyperbaric oxygen therapy.<sup>[14]</sup> In this therapeutic procedure 100% oxygen in an increased atmospheric pressure. A controlled randomized study of Marx *et al.*<sup>[15]</sup> compared the utilization of HBO versus antibiotic coverage in the prevention of ORN. Both groups had 37 patients included. The group that received the antibiotic prophylaxis, 11 patients developed ORN, whereas only two patients developed ORN who only received HBO dives. HBO briefly elevates tissue oxygen tension, thereby activates fibroblastic proliferation and further oxygen-dependent collagen synthesis. This aids in angiogenesis of the radiated area. The Marx protocol is usually adapted for treatment of ORN of jaws.<sup>[15]</sup>

The management of chronic cases is always additionally intricate and requires multidisciplinary approach. The localized lesion is eradicated through surgical debridement along with antimicrobial therapy as followed in our case too. In severe chronic cases, the treatment is surgical debridement followed by systemic antibiotic therapy for 4-6 weeks and local antibiotic drug delivery.<sup>[16]</sup>

## Conclusion

Osteomyelitis is known to be a profound bone infection with momentous morbidity and higher rate of recurrences. This requires ideal treatment plan for the management of this condition with medications mainly aimed at targeting the microbiological specimen identified. These patients should compulsorily be on regular follow-up so as to keep a check over the prognosis and aid in the prevention of further complications.

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