



## A Rare Case of Chronic Osteomyelitis of Maxilla in an Uncontrolled Diabetic Patient - A Case Report

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**ABSTRACT:** Osteomyelitis of the jaw is the inflammation of bone and bone marrow that develops in the jaw after a bacterial infection or other causes. The primary cause of chronic osteomyelitis is microbes as a result of an odontogenic space infection other causes are traumatic infection, blood borne infections and also immunocompromised patient are more prone to osteomyelitis. Osteomyelitis are more prone to occur in mandible than maxilla. In this case report, we are reporting a rare case of uncontrolled diabetic patient who suffered from severe chronic osteomyelitis of upper jaw. Patient was treated with segmental maxillectomy and no recurrence where seen in the follow up

Key words: Chronic osteomyelitis, diabetes, segmental maxillectomy

### I. INTRODUCTION:

The ancient Greek words osteon means bone and muelinos means marrow which describes the structural unit of bone. Osteomyelitis is considered as an inflammatory condition of the bone that usually begins as an infection of the medullary cavity, rapidly involves the haversian systems and quickly extends to the periosteum <sup>1</sup>. This disease commonly occurs in 5th to 6th decade of age. Patient in general accompanied by uncontrolled comorbidities are susceptible to this disease <sup>2</sup>. Rare form of osteomyelitis is noted to be in maxilla <sup>3-4</sup>. Few cases were reported along with diseases like actinomycosis and mucormycosis <sup>5</sup>. In India, the prevalence rate of maxillary osteomyelitis with diabetes mellitus is 45.1% <sup>6,7</sup>. It is known fact that osteomyelitis affects maxilla less than mandible because of porous maxillary bone and collateral flow of mid face. Before the use of antibiotics, osteomyelitis is known to be fatal among maxillofacial region. Discover of antibiotic, chemotherapeutic agents, the use of hyperbaric oxygen therapy and better surgical treatment options have great impact on prognosis. It has a bimodal distribution Male-to-female ratio is

approximately 2:1. The pathogen associated with osteomyelitis is Staphylococcus aureus, hemolytic streptococcus, pneumococcus, Escherichia coli, and Proteus species. Mixed bacterial infections are common <sup>8</sup>. The cause of chronic osteomyelitis is mostly microbiological originating from odontogenic infections and second common is systemic factors.

Systemic factors that weaken host resistance include diabetes, autoimmune disease; malnutrition, severe anemia, and the use of hormones. The factors that change the local blood circulation include osteopetrosis, radiation therapy, osteoporosis, and fibrous dysplasia of bone, which predispose individuals to jaw osteomyelitis.

Systemic symptoms are mild and include low-grade to high grade fever, emaciation, and anemia. The most common local symptoms include pain, facial swelling, and a draining fistula. So in this case report, we are presenting a unique case of chronic osteomyelitis of maxilla in an uncontrolled diabetic patient. A way to approach the case is discussed.

### II. CASE REPORT:

A 45 year old female patient reported with complaints of pain and mobility of teeth in the maxillary anterior region. The patient is a known case of diabetes mellitus but not undertaking medication regularly. Maxillary anterior teeth were root canal treated in a private dental clinic (figure 1) Patient reported with severe radiating pain to the left forehead. OPG (orthopantomogram) radiograph revealed severe bone loss in the left maxillary region (figure 2). CT(computer tomography)revealed extensive bone loss, mucosal thickening with obliteration of left maxillary sinus.(Figure 3)

Intraoral examination revealed inflammation of anterior maxillary gingiva extending from left incisors to premolars (figure 4). Grade 3 mobility of left maxillary anterior teeth was noted with tenderness on percussion. HbA1C



level was reported to be 9. Patient was treated for uncontrolled diabetes and was planned for sequestrectomy. After routine investigations, sequestrectomy was done under general anesthesia (GA) but fresh bleeding was not encountered, hence segmental maxillectomy was done with primary closure. Excised specimen was sent for histopathological evaluation, which reported as chronic osteomyelitis. Post operative antibiotics were given for a period of 1 week. Patient is on regular follow up (Figure 5). During post operative follow up patient had a opening in the mid palatal region and oroantral communication noticed (figure6). The defect is planned to be treated with obturator or secondary closure with flap.

### III. DISCUSSION:

Osteomyelitis of the jaw is mostly caused by odontogenic infection, in spite of the fact that other etiological factors include traumatic jaw fracture, necrotizing ulcerative gingivitis. Predisposing factors include diabetes mellitus, immunosuppression, malnutrition and radiation therapy. Osteomyelitis commonly spreads by hematogenous route. Tibia is most common site of osteomyelitis in adult individuals. The incidence of osteomyelitis is 2:10,000 people<sup>9</sup>. Clinical features that includes in most of the cases are pain, erythema, warm fluctuant swelling, tenderness on palpation and sinus formation. Symptoms include higher temperature, fatigue, irritability, restriction of movements, localised edema are noted on 50% of patients. Diagnostic studies includes radiographic changes usually gold standard to reflect the destructive process of osteomyelitis but there will be delay for atleast 2 week behind the process of infection. Areas of necrotic bone are identified using Computerised tomography. Scatter image resolution occurs due to metal on infected bone. MRI (magnetic resonance imaging) had been beneficial for diagnostic procedure that includes musculoskeletal infection. Infected bones are easily identified using bone scans. This particular type of bone infection mainly affects the mandible and less commonly the maxilla<sup>10</sup>. This illness is usually brought on by a bacterial infection, which most frequently has its roots in dental issues such as untreated dental caries, periodontal disease, or complicated dental extractions<sup>11,12</sup>. Additional risk factors for osteomyelitis of the jaws include trauma, systemic diseases such immunosuppression and diabetes mellitus, local tissue damage from radiation therapy (osteoradionecrosis), and bisphosphonate therapy (medication-related osteonecrosis). In certain instances, particularly in people with impaired immune systems, the

infection may spread from adjacent sinus or face infections<sup>13</sup>. Beginning with the introduction of pathogens into the bone, a series of events comprise the pathophysiology of osteomyelitis in the mandible<sup>14</sup>. This infection begins in the medullary cavity spreading to periosteum. The infection causes an inflammatory response that raises intramedullary pressure leading to decreased blood flow, and ultimately results in ischemia. As the infection worsens the impacted bone turns necrotic, which causes sequestra - isolated, dead bone pieces develops. These Fragments can host bacteria and leads to spread of infection further. Mandible has a compromised blood supply than the maxilla, hence more prone to necrosis. In the presented case, it is reported in maxilla which is a rare entity. Soft tissues nearby might get affected, which could result in the creation of an abscess and perhaps drain through sinuses. Inadequate management of acute infections can lead to chronic osteomyelitis in the mandible. Occasionally, the body tries to confine the infection, an involucrum - a thickening covering of newly formed bone forms surrounding the sequestrum. But the formation of biofilms on the sequestra and the existence of necrotic bone impede the infection's ability to heal, making it resistant to both antibiotic treatment and the immune system. The patient's quality of life may be significantly impacted by serious sequelae from this illness, such as pathological fractures, fistulae, and persistent discomfort. Culture sample should be obtained without the presence of antibiotics. This severe form of osteomyelitis requires a multidisciplinary treatment. Surgery treatment, Supportive care, and antibiotic regimen are all part of the treatment protocol. Medical Treatment: which include Empirical therapy in which particular microorganisms are identified, broad-spectrum antibiotics are employed to manage the illness and Targeted Therapy: Based on sensitivity tests and culture results, antibiotics are modified. There may be a need for ongoing intravenous antibiotics. Treatment should be tailored to specific flora. The surgical management of osteomyelitis of the jaw involves the removal of infected and necrotic bone tissue to eradicate the source of infection. Surgery is typically indicated when conservative treatment modalities, such as antibiotics, fail to control the infection or when there is extensive bone involvement. The primary surgical procedure is debridement, which entails the meticulous removal of all necrotic bone and infected soft tissue. This step is essential to prevent the spread of infection and to create a healthy environment that can support healing. Sequestrectomy or the removal of sequestra —



dead bone fragments that have broken away from live bone—may be required in situations of persistent osteomyelitis. In order to manage the infection, these sequestra that serve as a reservoir for bacteria must be eliminated. More drastic surgical procedures, such as segmental resection, can be necessary if the infection has significantly destroyed bone. In order to restore function and aesthetics, significant parts of the jawbone must be removed. Since in the presented case significant amount of bone was avascular, segmental resection of bone is done. Bone grafts or other reconstructive procedures may then be used in the restoration process<sup>15</sup>. Furthermore, soft tissue management is essential in addition to the above mentioned procedures. In our case primary closure is done. Sufficient closure of the surgical site is essential to guarantee appropriate healing and avoid reinfection. Large flaws may occasionally be covered by flap surgery, which offers a steady blood supply to the region and encourages recovery. Surgical care is to preserve or enhance the patient's function and quality of life, eradicate the infection source entirely, and restore the integrity of the jawbone. To get the best results, multidisciplinary cooperation between reconstructive surgeons, infectious disease experts and oral and maxillofacial surgeons is frequently required. Hyperbaric Oxygen Therapy (HBOT) has been applied as a supplemental therapy to improve the affected bone's oxygenation, which encourages recovery. Sufficient nutrition and pain management are essential for healing. To track the patient's response to therapy and identify any recurrences early, routine follow-up is crucial. When there has been significant bone loss, long-term treatment may include repair and rehabilitation. .

#### IV. CONCLUSION:

Treatment for osteomyelitis necessitates a multimodal strategy that includes surgical debridement, supportive care, and antibiotic therapy. The body of research, highlights how crucial it is to intervene quickly and forcefully to stop the progression of disease. These treatment modalities form a strong basis for comprehending the many facets of managing and treating this difficult illness. Comprehensive management of maxillary osteomyelitis in uncontrolled diabetes mellitus is sequestrectomy or segmental resection followed by definitive antibiotic therapy based on culture results and diabetes regulation for early cases. Early detection is a key to prevent further complications.

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**Informed Consent**

Patients consented to publish the photograph and all the results related to their condition.

Conflict of Interest None declared.



Figure 1: Preoperative intraoral photograph



Figure 2: CT of the patient revealing extensive bone loss of left maxilla

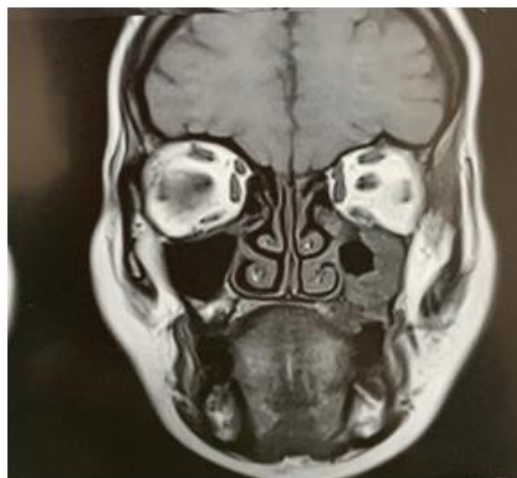


Figure 3: MRI of patient with left maxillary sinus involvement extending to infraorbital rim



Figure 4: Intraoperative photograph





Figure 5: Segmental maxillectomy with primary closure



Figure 6: Post operative follow up