

# Secondary Chronic Osteomyelitis of Maxilla Region: A Case Report

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**Abstract:** Background: Osteomyelitis is defined as an inflammatory condition of bone that begins as an infection of medullary cavity and Haversian system of the cortex and extend to involve the periosteum of the infected area. The maxilla have thin cortical bone and more cancellous bone leading to more blood supply and less chances of the osteomyelitis. However, it may cause serious complication for the patient such as infection of cranial cavity and brain. It is essential that maxillary osteomyelitis be diagnosed and treated aggressively by the surgeon to avoid subsequent dreaded consequences. Purpose: to report a case and management of secondary chronic osteomyelitis at right posterior region of maxilla treated with both medical and surgical interventions. Case: A 41 years old female patient reported to private hospital with chief complaint of pain, swelling, pus discharged and unhealed exposed bone of right posterior maxilla region after performed first molar tooth extraction ± 1 year ago, and was diagnosed as secondary chronic osteomyelitis. Case Management: The patient underwent both medical and surgical intervention with sequestrectomy. Conclusion: Osteomyelitis of maxillary region is a rare case due to its bone anatomical and blood supply. The key to treatment of osteomyelitis is early detection, which means early suspicion. The treatment of osteomyelitis of the maxilla region should be aggressive and requires both medical and surgical interventions.

**Keywords:** Osteomyelitis, Maxilla, Tooth extraction, Surgery

## 1. Background

Osteomyelitis is defined as an inflammatory condition of bone that begins as an infection of medullary cavity and Haversian system of the cortex and extend to involve the periosteum of the infected area. (Habib, Sivaji, and Ashraf 2016; Rajiv M Borle 2014) In the maxillofacial region, osteomyelitis primarily occurs as a result of contiguous spread of odontogenic infections or as a result of trauma. This can occur with the extraction of teeth, root canal therapy, or fractures of the maxilla or mandible. (Larsen, Waite, and Drive 2011)

Osteomyelitis of maxilla was originally described by Rees in 1847. (Chalichamala 2015) Osteomyelitis was a common disease before the advent of antibiotics. Today, osteomyelitis of the facial bone is a rare condition. (Chalichamala 2015; Habib et al. 2016) Maxillary osteomyelitis is much less frequent compared to mandible. The maxilla rarely undergoes necrosis because of the unique features, rich vascularity, thin cortical plate and a relative scarcity of medullary tissue. (Pattnaik et al. 2017) However, it may cause serious complication for the patient such as infection of cranial cavity and brain. (Habib et al. 2016; Manpreet et al. 2010; Pattnaik et al. 2017) Thus, it is essential that maxillary osteomyelitis be diagnosed and treated aggressively by the surgeon to avoid subsequent dreaded consequences. (Manpreet et al. 2010; Pattnaik et al. 2017) Treatments for osteomyelitis of the jaws include incision and drainage, antibiotics, *sequestrectomy*, extraction of teeth, *saucerisation*, *decortication*, resection of the jaw and hyperbaric oxygen therapy. (Chalichamala 2015)

Here we present a rare case of secondary chronic osteomyelitis of maxilla region due to extraction of maxillary first molar with sequestration and its management.

## 2. Objectives

A 41 years old female patient reported to private hospital with chief complaint of pain, swelling, pus discharged and unhealed exposed bone of right first maxillary region. Patient also gave a history of extraction of right maxillary first molar about 1 year ago following its mobility. From extra-oral examination there was mild swelling over the nasolabial area. On intra-oral examination in the area of the extraction the socket was unhealed and showed the exposed necrotic grey to brown colored bone with halitosis. A panoramic radiograph was taken, which showed radiolucency with sequester formation at the affected area of extraction site and surrounding teeth.

Based on the history, clinical, and radiograph observation, a diagnosis was made as a secondary chronic osteomyelitis. Surgical debridement starts with removal of loosened teeth in the infected area, by extracting of right maxillary second premolar, second molar and third molar teeth; as well as removal of the sequestra. The area of the socket was curetted, debrided, and irrigated and the wound was secondarily closed using iodoform pack. The necrotic bone along with granulation tissue was sent for histopathological examination. Culture and sensitivity of antibiotic examination was also performed to obtain a more specific culture-guided antibiotic therapy. On every follow-up the iodoform gauze was changed after thorough irrigation and dressing was placed.



Figure 1: Panoramic radiograph

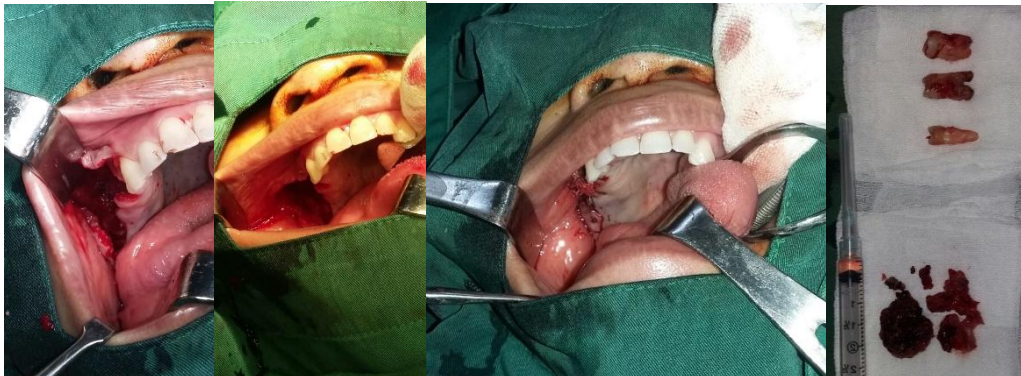


Figure 2: Intraoperative findings (left to right): (a) removal of loosened teeth and sequestra; (b) after curetted, debrided, and irrigated; (c) closed using iodoform pack; (d) bony sequestrum and granulation tissue

### 3. Discussion

Osteomyelitis typically appears during the 5<sup>th</sup> and 6<sup>th</sup> decades of life.(Chalichamala 2015; Ramesh et al. 2016)The incidence of osteomyelitis is much higher in the mandible due to the dense poorly vascularized cortical plates and the blood supply primarily from the inferior alveolar neurovascular bundle.(Larsen et al. 2011) The maxilla have thin cortical bone and more cancellous bone leading to more blood supply and less chances of the osteomyelitis.(Rajiv M Borle 2014)Diminished host defences, both local and systemic, can contribute significantly to the emergence and clinical course of the disease.(Baltensperger and Eyrieh 2009; Manpreet et al. 2010)Consistent with the case above, osteomyelitis occurs during 5<sup>th</sup> decades, but otherwise occur in the maxilla region whereas it should be the less chance of osteomyelitis.

Factors predisposing to osteomyelitis of the maxilla include dental infections, maxillary sinusitis, trauma, and radiation.(Habib et al. 2016) The dental infection may be from a root canal, a periodontal ligament or an extraction site.(Manpreet et al. 2010)Inflammation has its origin in the bone marrow, and extends to cancellous bone spaces. It then spreads through blood vessels, fibro-elastic tissues, and eventually to the periosteum. When the vascularity of bone tissue is compromised, it induces bone necrosis and sequestration.(Ramesh et al. 2016)

The principal reason of chronic osteomyelitis is frequently microbiological odontogenic infection, complications post extractions, unsatisfactory amputation of necrotic bone, early cessation of antibiotic therapy, inappropriate choice of antibiotics, poor diagnosis of the condition, trauma, and

insufficient anagement for fracture or irradiation.(Kamakshi et al. 2016)This case, may due to local factors arises from post extraction site leads to inflammation in the bone marrow and furthermore becoming osteomyelitis. Inappropriate choice of antibiotics at the earlier stage may also contribute to chronification of the disease.

Baltensperger, showed that every type of jawbone surgery, in this case including extraction of teeth, inevitably leads to a certain degree of local trauma to the bone, which causes local ischemia and may facilitate deep invasion of bacteria into the medullar cavity; hence, osteomyelitis can be established. Systemic and local conditions that alter the vascularity of bone predispose the development of osteomyelitis. In this conditions immune cells and oxygen cannot reach the target area an adequate manner. This facilitates the growth and spread of microorganisms, especially anaerobes, leading to establishment and progression of osteomyelitis.

Initial correct diagnosis of secondary chronic osteomyelitis must be established prior to any successful treatment. Adequate diagnosis can usually be achieved based on history, clinical evaluation, and imaging studies. (Baltensperger and Eyrieh 2009)

The treatment for maxillary osteomyelitis range from a noninvasive approach to a more invasive radical treatment. A combination of antibiotic treatment with surgery has shown to be effective in treating the condition, as shown in the management of this case. Surgical treatment involves removal of loose teeth and sequestra, debridement, decortication, resection, and reconstruction.(Habib et al. 2016)

#### 4. Conclusion

Osteomyelitis of maxillary region is a rare case due to its bone anatomical and blood supply. The key to treatment of osteomyelitis is early detection, which means early suspicion. The treatment of osteomyelitis of the maxilla region should be aggressive and requires both medical and surgical interventions. Surgical treatment is almost always part of the treatment plan, mainly in secondary chronic osteomyelitis.

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