

“CHRONIC OSTEOMYELITIS OF THE JAW : A CASE REPORT.”

Dentistry

Dr. Kavita Wadde	Associate Professor Department Of Oral & Maxillofacial Surgery Govt Dental College And Hospital Mumbai
Dr. Harshvardhan Shelke*	Junior Resident Department Of Oral & Maxillofacial Surgery Govt Dental College And Hospital Mumbai *Corresponding Author
Dr. Samir Khaire	Associate Professor Department Of Oral & Maxillofacial Surgery Govt Dental College And Hospital Mumbai
Dr. Shambhavi Nadkarni	Junior Resident Department Of Oral & Maxillofacial Surgery Govt Dental College And Hospital Mumbai

ABSTRACT

Background: Osteomyelitis is a bone inflammation that starts as a medullary cavity infection and spreads quickly to the haversian system and periosteum. Can develop in the jaws due to chronic odontogenic infection, trauma, inadequate treatment of fracture, or jaw irradiation. Untreated acute osteomyelitis can become chronic. Common outcomes of chronic osteomyelitis includes sequestrum formation, dental abscess & pathological fracture due to weakened bone. Severe outcomes also includes sepsis (a life-threatening condition), extensive tissue death can occur due to necrosis, leading to significant bone loss and disfigurement & rarely death because mortality rates can be high in patients with severe, uncontrolled infections. Diagnosis involves conventional radiography, culture, bone biopsy, radioisotope bone scan, laser Doppler flowmetry, computed tomography, and magnetic resonance imaging. This case report highlights various steps involved in the diagnosis of chronic osteomyelitis & prompt surgical management with decortication and sequestrectomy of the lesion of chronic suppurative osteomyelitis.

KEYWORDS

INTRODUCTION :

Osteomyelitis is considered "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 of the area". [1]

The incidence rate of osteomyelitis of the jaw is higher in developing countries like India than in developed countries. Osteomyelitis of the head and neck skeleton region is more frequent in jaw bones because the presence of teeth creates a direct pathway to the bone through pulpal and periodontal disease. It is more common in the mandible than the maxilla. This is because the mandible has a poorer blood supply than the maxilla, making it more susceptible to infection. [2]

Chronic osteomyelitis typically has a microbiologic root cause that includes an odontogenic infection, trauma, improper selection or early discontinuation of antibiotic therapy, and bacterial virulence. [3] The medications linked to osteomyelitis are steroids, chemotherapeutic agents, bisphosphonates, and other toxic therapeutic agents [4]

Host defences also influence osteomyelitis development. Systemic illnesses like AIDS, diabetes mellitus, tuberculosis [5], autoimmune disorders, cancer, and malnutrition have all been linked to osteomyelitis. Steroids, chemotherapeutic drugs, and bisphosphonates are among the medications with potential effects on osteomyelitis. Local variables that affect vascularity, including radiation, bone disease, and osteoporosis. [6]

Patients who are noncompliant and resistant to medical treatment are also more likely to develop osteomyelitis of the jaws. Other risk factors include patient age, nutritional status, immunosuppression, microvascular disease, and difficulty accessing medical treatment. [6] Osteomyelitis is diagnosed based on patient history, clinical examinations, and surgical & radiographic findings. [7] Histopathologic examinations can be consistent with the diagnosis and the microbiologic tests can be helpful. [8]

The following case report highlights various steps involved in the diagnosis & management of such lesions.

Case Presentation :

A 50 year old female patient reported with the chief complaint of pain & pus discharge from the lower right back region of jaw from last 15 days. On general examination there was no significant medical or

family history. The patient was average built, conscious, cooperative and afebrile. Patient had history of dental extractions with all her teeth in past one year.

General physical and systemic examinations did not reveal any significant diagnostic information. On extra oral examination, a swelling was noted in right side lower jaw (figure 1A). Skin over swelling was normal & Sub-mandibular lymph nodes were palpable.

Intra-orally complete edentulous mandibular arch noted, a swelling present in the right posterior teeth region of mandible. Buccal expansion was noted along with pus discharge in the same region & Mild erythema was present on mucosa over swelling.

The digital panoramic radiograph revealed radiolucency with loss of normal trabecular pattern in the region of lower right second molar. The margins of the radiolucency was ill defined and poorly corticated along with root piece in lower right third molar region (figure 1B). For better evaluation of lesion CBCT was done. CBCT showed irregular hypodense area at the lower right second molar region. Thinning & perforation of Buccal cortical plate was also noted. Some areas of diffuse bony sclerosis were also present with in the lesion (Figure 2).

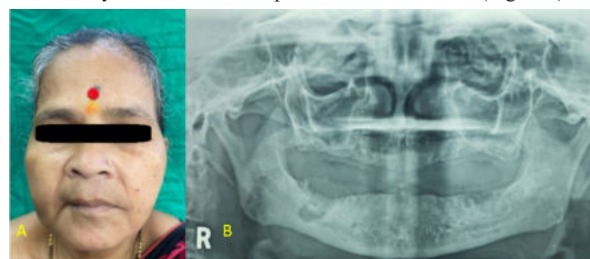


Figure 1a Extra oral photograph

Figure 1b Orthopantomogram

Pus discharge sample was sent for culture revealed no growth of mycobacterium tuberculosis complex in 6 weeks of incubation period and also TB gene expert test was done, report was negative. All the routine investigations were carried out & was normal, so patient was planned for decortication and sequestrectomy procedure.

The patient was started with intravenous antibiotics, amoxicillin with Clavulanic acid 1.2 grams and metronidazole 500mg/100ml 1 hour

prior to procedure and was taken for decortication and sequestrectomy of the lesion. Under all aseptic condition, local anesthesia crestral incision was given from 43 to 48 region, full thickness flap was raised and lesion was exposed. The exposed sequestrum was removed along with adjacent tooth root, curettage and thorough betadine irrigation was performed (figure 3A, 3B). Patient recovery was uneventful. All excised tissue was sent for histopathologic examination (figure 4). Patient was discharged with oral amoxicillin & clavulanic acid 625mg 2 times a day was continued for 7 days. Patient was followed for 2 years, there was no signs of recurrence.

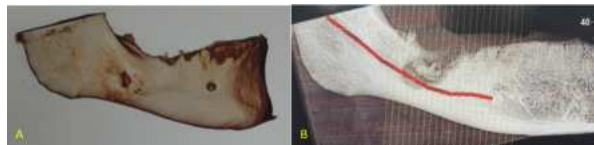


Figure 2a. 3d image showing cortical perforation B. showing hypodense area interspersed with isodense structure



Figure 3a Lesion surgically exposed

Figure 3b Healthy bone cavity after removal of sequestered bone



Figure 4 Sequestrectomy specimen sent for histopathologic examination

DISCUSSION:

Osteomyelitis of the jaw is a rare but serious infection of the bone. Chronic suppurative osteomyelitis of the jaw is serious and often debilitating. It is usually caused by a bacterial infection that spreads from an untreated dental infection or trauma to the jawbone. Other risk factors include poor oral hygiene, dental trauma or injury, compromised immune system, and certain systemic conditions like diabetes, and tuberculosis. [5] The probable cause of disease in our case was an odontogenic periodontal infection in relation to the right lower posterior teeth.

The condition typically presents with persistent jaw pain and swelling. Other common symptoms include difficulty in opening the mouth, drainage of pus from the affected area, bad breath, loose teeth, and sometimes, fever. [9,10] Our patient presented to us with dull aching pain, intraoral pus discharge in the right posterior teeth region of the mandible, and bad breath. The symptoms may fluctuate in intensity and duration. A diagnosis of osteomyelitis is based on the presence of painful sequestra and suppurative areas in the tooth-bearing jawbone that are unresponsive to debridement and conservative therapy. [11,12] Diagnosis of chronic suppurative osteomyelitis of the jaw involves a combination of clinical evaluation, radiographic imaging such as dental X-rays or CT scans, and microbial culture and sensitivity testing to identify the specific bacteria causing the infection. [9,10,13] Histologically, an increased number of osteoblasts, thickened bony trabeculae, and fibrous marrow replacement are found. Pathologic bone remodeling and the presence of chronic inflammatory cells are often cited as indicators of osteomyelitis. [14] In our case, the clinical and radiographic diagnosis was confirmed by histologic examination of the specimen.

The differential diagnosis of these lesions includes Paget disease, hypercementosis, fibrous dysplasia, early stage malignant bone tumor, osteogenic sarcoma, and fibrous dysplasia. [13,15]

According to Van Merkesteyn and Bakker, the Treatment of choice for

chronic osteomyelitis of the mandible typically involves a combination of antibiotics and surgery. [14] The goal of treatment is to clear the infection and prevent further damage to the bone. Bernier S. et al suggested surgical therapy consists of sequestrectomy or decortication with saucerization of the affected bone, as well as the removal of necrotic tissues, broken teeth, and roots. [16] The choice of antibiotic will depend on the type of bacteria that is causing the infection. In some cases, hyperbaric oxygen therapy may be used in addition to antibiotics and surgery. Hyperbaric oxygen therapy involves breathing pure oxygen in a pressurized chamber. This can help to increase the oxygen levels in the tissues, which can help to kill bacteria and promote healing. [17,18]

It's important to note that chronic suppurative osteomyelitis of the jaw is a complex condition that requires a multidisciplinary approach involving oral and maxillofacial surgeons, dentists, infectious disease specialists, and sometimes, radiologists. Treatment plans may vary based on individual patient factors, disease severity, and the expertise of the healthcare team involved. [19] Given the seriousness of osteomyelitis of the jaw, it is essential to develop more comprehensive guidelines for both prevention and treatment. Our case showed significant radiographic resolution of the postoperative bony defect in 12 months, which can be attributed to the total elimination of the infectious process from the region.

CONCLUSION:

This case report highlights the successful management of a complex case of jaw osteomyelitis. Despite the challenges posed by the extent of bone involvement and potential for chronic infection, aggressive surgical debridement involving decortication and sequestrectomy, coupled with appropriate antibiotic therapy, resulted in significant clinical improvement and resolution of the infectious process, allowing our patient to undergo further rehabilitation & dental prosthesis.

While surgical intervention is often considered the gold standard for osteomyelitis management, the importance of early diagnosis and prompt initiation of antimicrobial therapy cannot be overemphasized. Long-term follow-up is essential to monitor for potential recurrence and to address any sequelae of the disease.

This case underscores the need for a comprehensive treatment plan tailored to individual patient characteristics and the severity of the infection.

Declarations:

This article was previously posted to the Research Square preprint server on June 13, 2023.

Ethics Approval And Consent To Participate:

We confirm that this case report was conducted in accordance with the ethical guidelines of ethics committee, government Dental college & hospital, Mumbai.

We obtained written informed consent from the patient for publication of this case report and any accompanying images.

Consent For Publication:

The patient has consented to the publication of this case report and any accompanying images.

Competing Interests:

The authors declare that they have no competing interests.

Funding:

None.

Acknowledgements:

We thank the patient for their consent to this case report.

REFERENCES:

1. Mehra H, Gupta S, Gupta H, Sinha V, Singh J: Chronic suppurative osteomyelitis of mandible: a case report. *Chronic suppurative osteomyelitis of mandible: a case report. Craniomaxillofac Trauma Reconstr.* 2013, 6:197-200. 10.1055/s-0033-1343781
2. Baur DA, Altay MA, Flores-Hidalgo A, Ort Y, Quereshey FA: Chronic osteomyelitis of the mandible: diagnosis and management--an institution's experience over 7 years.. *Chronic osteomyelitis of the mandible: diagnosis and management--an institution's experience over 7 years. J Oral Maxillofac Surg.* 2015, 73:655-65. 10.1016/j.joms.2014.10.017
3. Kim SG, Jang HS: Treatment of chronic osteomyelitis in Korea. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001, 92:394-8. 10.1067/moe.2001.117810
4. Nezafati S, Ghavimi MA, Yavari AS: Localized osteomyelitis of the mandible secondary to dental treatment: report of a case. *J Dent Res Dent Clin Dent Prospects.* 2009, 3:67-9. 10.5681/joddd.2009.016
5. Wadde K R, Alam N, Chapane A: Tubercular osteomyelitis of the jaw - 2 case report. J

- Oral Med Oral Surg Oral Pathol Oral Radiol. 2019; 5:85-87. 10.18231/j.jooo.2019.021
6. Dym H, Zeidan J: Microbiology of Acute and Chronic Osteomyelitis and Antibiotic Treatment. *Dent Clin North Am*. 2017; 61:271-282. 10.1016/j.cden.2016.12.001
 7. Andre CV, Khonsari RH, Ernenwein D, Goudot P, Ruhin B: Osteomyelitis of the jaws: A retrospective series of 40 patients. *J Stomatol Oral Maxillofac Surg*. 2017; 118:261-264. 10.1016/j.jormas.2017.04.007
 8. Lucidarme Q, Lebrun D, Vernet-Garnier V, Le Gall J, Diallo S, Mauprivez C, Derruau S: Chronic Osteomyelitis of the Jaw: Pivotal Role of Microbiological Investigation and Multidisciplinary Management—A Case Report.. *Chronic Osteomyelitis of the Jaw: Pivotal Role of Microbiological Investigation and Multidisciplinary Management—A Case Report. Antibiotics*. 2022; 24:568. 10.3390/antibiotics11050568
 9. Berglund C, Ekströmer K, Abtahi J: Primary chronic osteomyelitis of the jaws in children: an update on pathophysiology, radiological findings, treatment strategies, and prospective analysis of two cases. *Case reports in dentistry*. 2015; 7:2015. 10.1155/2015/152717
 10. Gudmundsson T, Torkov P, Thygesen T: Diagnosis and treatment of osteomyelitis of the jaw-A systematic review (2002-2015) of the literature. *Journal of Dentistry & Oral Disorders*. 2017; 30:1066.
 11. Hudson JW: Osteomyelitis of the jaws: a 50-year perspective. . *Osteomyelitis of the jaws: a 50-year perspective. J Oral Maxillofac Surg*. 1993; 15:1294-301. 10.1016/s0278-2391(10)80131-4
 12. Fenelon M, Germandt S, Aymon R, Scolozzi P: Identifying Risk Factors Associated with Major Complications and Refractory Course in Patients with Osteomyelitis of the Jaw: A Retrospective Study. *J Clin Med*. 2023; 17:4715. 10.3390/jcm12144715
 13. Petrikowski CG, Pharoah MJ, Lee L, Grace MG: Radiographic differentiation of osteogenic sarcoma, osteomyelitis, and fibrous dysplasia of the jaws. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 1995; 80:744-750. 10.1016/s1079-2104(05)80260-4
 14. Van Merkesteyn JP, Groot RH, van den Akker HP, Bakker DJ, Borgmeijer-Hoelen AM: Treatment of chronic suppurative osteomyelitis of the mandible. *Int J Oral Maxillofac Surg*. 1997; 26:450-454. 10.1016/s0901-5027(97)80012-4
 15. Theologie-Lygidakis N, Schoinohoriti O, Iatrou I: Surgical management of primary chronic osteomyelitis of the jaws in children: a prospective analysis of five cases and review of the literature. *Oral Maxillofac Surg*. 6 of 7 2011; 15:41-50. 10.1007/s10006-010-0248-3
 16. Ylikontiola L, Altonen M, Uhari M, et al.: Chronic sclerosing osteomyelitis of the mandible in monozygotic twins. *Int. J Oral Maxillofac Surg*. 1994; 23:359-362. 10.1016/s0901-5027(05)80055-4
 17. Bernier S, Clermont S, Maranda G, Turcotte JY: Osteomyelitis of the jaws. *J Can Dent Assoc*. 1995; 61:445-448.
 18. Cortés-Penfield NW, Kulkarni PA: The History of Antibiotic Treatment of Osteomyelitis . *Open Forum Infect Dis*. 2019; 8:181. 10.1093/ofid/ofz181
 19. Marx RE: Chronic osteomyelitis of the jaws . *Oral Maxillofac Surg Clin North Am*. 1991; 3:367-381. 10.1016/S1042-3699(20)30505-7