

## Case Report

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# A rare case report of chronic suppurative osteomyelitis of the mandible in modern era of broad spectrum antibiotics

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## ABSTRACT

Historically, osteomyelitis of the jaw was a common complication of odontogenic infection (infections of the teeth). The term osteomyelitis refers to an inflammation of cortex and medulla of the bone that can develop in the jaw after any infection of the oral cavity. Since the introduction of potent antibiotics, the incidence of osteomyelitis has been dramatically decreasing. This case report describes an interesting presentation of chronic suppurative osteomyelitis of the mandible in a 73 years old male patient from North Eastern part of India. Investigations revealed chronic osteomyelitis of right ramus and body of mandible. The treatment included a pre surgical course of antibiotics followed by right side hemimandibulectomy and again post-operative antibiotics. The post-operative healing was uneventful. Detailed discussion of etiology, risk factor, symptoms, signs, management and prevention has been done in this case report. We conclude that surgical debridement in addition to empirical antibiotics should be considered as an early approach for treating such cases.

**Keywords:** Chronic osteomyelitis of mandible, Odontogenic infection, Chronic suppurative osteomyelitis, Hemimandibulectomy

## INTRODUCTION

The word osteomyelitis originates from ancient Greek word osteon (bones) and muleinos (marrow) which means infection of medullary portion of bone. Chronic osteomyelitis is the term used for when the condition lasts for more than eight weeks. Signs and symptoms may include: severe throbbing pain, discharging sinus, swelling, headache, facial pain. Other features may include loosening of teeth, trismus, dysphagia, anesthesia, paresthesia, cervical lymphadenitis.<sup>1-3</sup> Generalized features like fever, malaise, lassitude, anorexia are frequently present. Leucocytosis, raised erythrocyte sedimentation rate and C-reactive protein are common laboratory findings. The common causative organisms in odontogenic infections are a mixture of alpha haemolytic

*Streptococci* and anaerobic bacteria from the oral cavity such as *Peptostreptococcus*, *Fusobacterium*, *Prevotella* and *Staphylococcus epidermidis*.<sup>4</sup> Management strategies are based on timely culture- directed antibiotics and thorough surgical debridement. It is quite uncommon nowadays to witness odontogenic infection resulting in chronic suppurative osteomyelitis (CSO) of mandible to such an extent that the only viable treatment option is a mandibulectomy to prevent further complications.<sup>4,5</sup>

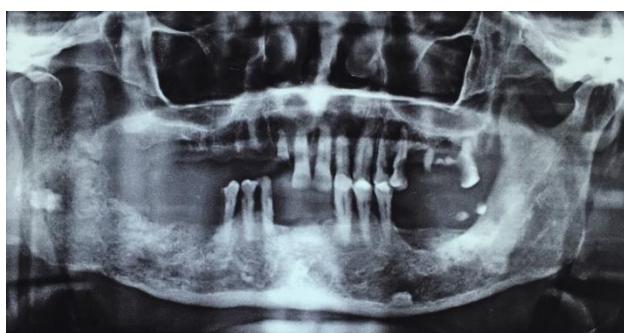
## CASE REPORT

A 73 year old male, farmer by occupation presented in outpatient department of Otorhinolaryngology of a tertiary care hospital in North East India with complaints of recurrent pain and swelling in his right lower jaw since

6 month (Figure 1). There was a history of recurrent toothache one year back following which right lower canine and premolars were extracted in a local clinic of a nearby town and was given broad spectrum antibiotics for 10 days. There was no history of trauma or fever. Thereafter he developed pain in the right lower jaw for which he was admitted at a local hospital and was treated with intravenous antibiotics for last 2 months. His medical history was unremarkable with no systemic disease or known allergy.



**Figure 1: Right sided swelling over mandible.**

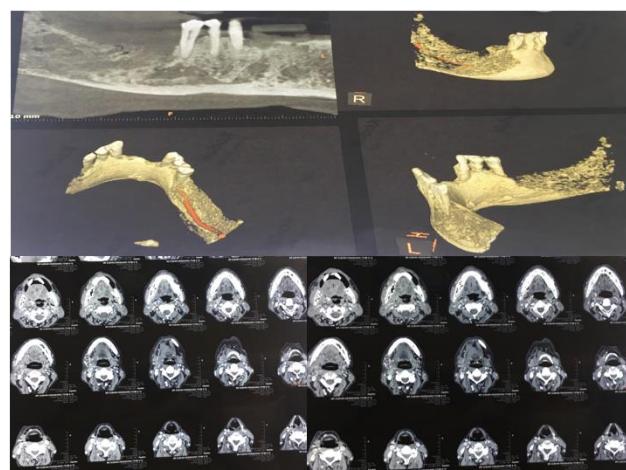


**Figure 2: Orthopantogram showing sequestrum and lytic lesion of right side of mandible.**

On extra oral examination, a marked swelling was noted involving the right side of the mandible with a fetid odor. The swelling was over the body of right mandible and was bony hard, diffuse and tender. The mouth opening was adequate and there was no regional lymphadenitis. Intra oral examination showed a retained, carious right second molar while the premolar and canine were absent on the right side. The left side teeth were normal. There was no sinus in the adjacent mucosa or skin. The socket of the extracted tooth and the surrounding area had a moth eaten appearance. A provisional diagnosis of CSO of the right side of mandible was made based on the history and clinical examination.

Hematological investigations showed that the patient was anemic with a hemoglobin level of 9.1 g/dl. His total

leucocyte count, erythrocyte sedimentation rate (ESR) and C reactive protein were 19.04, 35 mm/hour and 7.21 mg/dl respectively. There was evidence of sequestrum formation on orthopantomogram (Figure 2) and CT scans (Figure 3) involving right ramus and body of mandible. His echo showed concentric left ventricular hypertrophy and diastolic dysfunction and Thyroid stimulating hormone was 1.04. Other blood values of the patient including blood glucose levels, liver function test, renal function test, anti-human immunodeficiency virus, hepatitis B virus and hepatitis B virus were within the normal range.

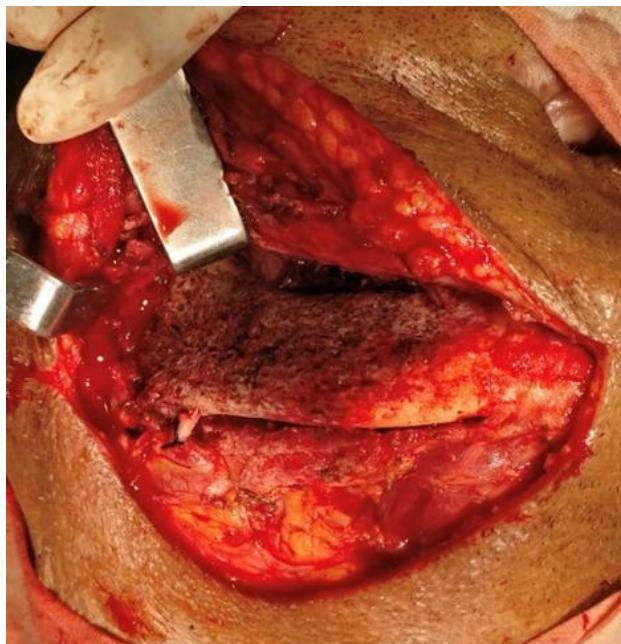


**Figure 3: Computed tomography with three dimensional reconstruction.**

Patient was admitted and informed written consent was taken, preoperative preparation was made after taking medicine and cardiology clearance. One unit whole blood was transfused to correct anemia. Empirical antibiotic therapy was initiated preoperatively with ceftriaxone 1 gm intravenous twelve hourly and metronidazole 500 mg intravenous administered intravenously every eight hourly. Hemimandibulectomy was planned as the involvement was widespread and options like saucerisation and sequestrectomy would have been inadequate.

Under general anesthesia and preoperative antibiotic coverage standard painting and draping was done. The involved region of the mandible was exposed after raising skin flap of about 8 cm extending from midline to angle of mandible (Figure 4) and of optimum thickness to ensure marginal mandibular nerve is preserved. Intraoperative assessment of mandible showed completely eroded, black, foul smelling necrotic bone extending from mental foramen till right condyle of mandible. Giggle's saw was used to resect the right hemi mandible and diseased periosteum and surrounding soft tissue was resected and sent for histopathological examination and culture and sensitivity. Hemostasis was achieved with cautery, ligation and bone wax. Thorough wash with betadine, hydrogen peroxide and normal saline was given. Oral cavity mucosa was sutured in two layer

with vicryl 3-0 and skin was sutured in layers with vicryl 3-0 and ethilon 3-0 after putting a negative suction drain. Post operatively antibiotics were continued and feeding was started via a naso-gastric tube after six hours. Adequate analgesia was given for post-operative pain management.



**Figure 4: Intra operative finding.**

The biopsy report confirmed the diagnosis of chronic osteomyelitis with evidence of chronically inflamed fibrous connective tissue filling the inter trabecular spaces of bone. Administration of ceftriaxone 1 gm, amikacin 500 mg and metronidazole 500 mg intravenously every 12 and 8 hourlies respectively were continued for one week postoperatively as they were found sensitive in culture and sensitivity reports. The isolated organisms were of mixed flora. The patient was discharged from the ward after one week when dressings were clean and no discharge was present. Oral antibiotic therapy with amoxicillin and clavulonic acid 625 mg and metronidazole 400 mg 8 hourlies were continued for another three weeks. The patient was reviewed regularly during periodic follow up visits in the outpatient department. The stitches were removed on tenth post-operative day. At this stage, satisfactory healing was observed and there were no clinical signs or symptoms to indicate persistent infection. Repeat total leucocyte count, ESR and C-reactive protein were within normal range suggesting successful therapy.

The surgery went uneventfully without any intraoperative complications. Post operatively the patient was on liquid diet for two weeks which was later converted to semi solid diet after stitch removal and wound healing. Patient had mild pain while chewing which was managed with oral paracetamol. The last follow up was at three months post-operative, the patient had no fresh complaints, no

swelling and no discharge. The total leucocyte count, erythrocyte sedimentation rate and C-reactive protein within normal range.

## DISCUSSION

This case report highlights some uncommon complication of osteomyelitis as a sequelae to carious teeth in modern era of antibiotics. A unique aspect of this case report is that uncontrolled infection flared up to the stage where surgical debridement was not possible and this scenario is rare to find now a days. Certain pre disposing factors are required for development of osteomyelitis of the jaw. Some of those factors are local vascular compromise, immunocompromised state like diabetes mellitus, etc. Other causes can be familial hyper coagulation, autoimmune diseases, agranulocytosis, leukaemia, severe anaemia, syphilis, chemotherapy, corticosteroid therapy, sickle cell disease, acquired immunodeficiency syndrome, old age, malnutrition, smoking and alcohol consumption, radiotherapy, osteoporosis, Paget's disease of bone, fibrous dysplasia, bone malignancy and causes of bone necrosis such as bismuth, mercury, arsenic and bisphoshonates.<sup>6-10</sup> One study concluded that actinomyces is involved in the chronic, non-healing inflammatory processes.<sup>7</sup> Marx and Mercuri were the first authors to define the duration of 4 weeks for acute osteomyelitis, after which it should be considered a chronic affection.<sup>1,9</sup>

Poor compliance or access to health care is also a risk factor. Mandible is more commonly affected than the maxilla. It has a relatively poor blood supply, which deteriorates with increasing age. The cortical plates are thick and there is a medullary cavity. The sites of the mandible most commonly affected by osteomyelitis (OM) are (decreasing order of frequency) the body, the symphysis, the angle, the ramus and finally the condyle. The blood supply to mandible is chiefly by the inferior alveolar artery, and somewhat by the periosteal supply. Compromise of this supply is a critical factor in the development of OM in mandible. The acute OM in the jaws gives only a moderate systemic reaction and the person remains surprisingly well. Acute osteomyelitis of the mandible may give an appearance resembling a typical odontogenic infection, but the periosteal covering acts as a barrier to the spreading cellulitis. If the infection is not controlled, the process becomes chronic as was seen in this case. The best stage of intervention is acute stage, and the treatment will be aggressive intravenous antibiotics and prevent progression to chronic stage. One study suggests that surgical debridement is a definitive treatment method for CSO of the mandible as it gives favourable clinical, functional and radiologic results.<sup>11</sup> This finding is consistent with our study where surgical debridement is considered as the backbone for management of chronic osteomyelitis. Another author concluded that better outcomes are seen with larger resection, more number of debridements along with vascular grafts and flaps.<sup>6</sup>

Although we managed to treat this case successfully, one limitation of this case is that at the age of 73 years the patient had to undergo such an aggressive procedure which was a matter of concern for us as well as patients' relatives. Our case showed consideration of early radiographic resolution and microbiological culture can be very helpful in refractory cases not responding to antibiotics. With our timely and appropriate action of considering hemimandibulectomy, cured the patient of his long-standing suffering and prevented further life-threatening complication.

## CONCLUSION

We recommend that surgical debridement and empirical antibiotic therapy should be considered as the treatment of choice as compared to antibiotics or peripheral or segmental resection alone. Regular follow up of the patients is required as recurrence is not uncommon. Appropriate and timely action can prevent the need for such aggressive approach.

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## REFERENCES

1. Mercuri LG. Acute osteomyelitis of the jaws. *Oral Maxillofacial Surg Clin N Am -Infections Head Neck.* 1991;3(2):355-65.
2. Hudson JW. Osteomyelitis of the jaws: a 50-year perspective. *J Oral Maxillofacial Surg.* 1993;51(12):1294-301.
3. Cierny III G, Mader JT, Penninck JJ. A clinical staging system for adult osteomyelitis. *Clin Orthop Related Res.* 2003;414:7-24.
4. Scafer WG. Osteomyelitis, in *A Textbook of Oral Pathology*, 3rd edition, Philadelphia, Pa, USA: Elsevier Saunders; 1974: 453.
5. Krutchkoff DJ, Runstad L. Unusually aggressive osteomyelitis of the jaws. A report of two cases. *Oral Surg Oral Med Oral Pathol.* 1989;67(5):499-507.
6. Mütke T, Koschinski J, Deppe H, Wagenpfeil S, Pautke C, Mitchell DA, et al. Outcome of treatment and parameters influencing recurrence in patients with bisphosphonate-related osteonecrosis of the jaws. *J Cancer Res Clin Oncol.* 2011;137(5):907-13.
7. Hansen T, Kunkel M, Weber A, James KC. Osteonecrosis of the jaws in patients treated with bisphosphonates-Histomorphologic analysis in comparison with infected osteoradionecrosis. *J Oral Pathol Med.* 2006;35(3):155-60.
8. Thumbrigere-Math V, Sabino MC, Gopalakrishnan R, Huckabay S, Dudek AZ, Basu S, et al. Bisphosphonate-related Osteonecrosis of the Jaw: clinical features, risk factors, management, and treatment outcomes of 26 patients. *J Oral Maxillofac Surg.* 2009;67(9):1904-13.
9. Marx RE. Chronic osteomyelitis of the jaws. *Oral Maxillofacial Surg Clin N Am- Infections Head Neck.* 1991;3(2):367-81.
10. Robinson JL, Vaudry WL, Dobrovolsky W. Actinomycosis presenting as osteomyelitis in the pediatric population. *Pediatr Infect Dis J.* 2005;24(4):365-9.
11. Mehra H, Gupta S, Gupta H, Sinha V, Singh J. Chronic suppurative osteomyelitis of mandible: a case report. *Craniomaxillofac Trauma Reconstr.* 2013;6(3):197-200.

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