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Comprehensive Surgical Management of Chronic Suppurative Osteomyelitis Extending to The Lower Border of Mandible – A Case Report

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Abstract

Background: Osteomyelitis of maxillofacial skeleton is common in developing countries such as India. This case report describes successful surgical treatment of chronic suppurative osteomyelitis {CSO} of the mandible of a 35yr old female. The precipitating factor was thought to be eventful extraction in the {left } posterior body at the inferior border of mandible. **Methods:** Presurgical course of antibiotics (Amoxycillin and metronidazole for 7 days and later followed by doxycycline for 1 month).Surgical debridement of the affected bone and reinforcing it with reconstruction plate using AO principles was done . Patient was kept on a high nutrient diet consisting of proteins. **Conclusion:** The case report demonstrates the typical features of CSO . The combination of the antibiotics therapy and surgical debridement was successful in the treatment of chronic suppurative osteomylitis.

Keywords: Osteomyelitis, Suppurative, Debridment.

Introduction

Osteomyelitis is an inflammatory disease of the bone that usually begins as an infection of the medullary cavity rapidly spreading through the harversian system and extending in the area of the periosteum.[1]Osteomyelitis is defined as an inflammation of the bone marrow with a tendency to progression. It develops as a complication of dental extraction, maxillofacial trauma with inadequate treatment of fracture, irradiation of mandible, Paget's disease of bone, bone malignancy are the different conditions which play an important part in etiopathogenesis of osteomyelitis, affecting the vascularity of the bone included.[2] .The decline in prevalence can be attributed to increased availability and progressively higher standards of oral and dental health. As a result of antibiotic resistance in the recent years, prevalence of osteomyelitis has increased with major diagnostic and therapeutic challenges.[3] The condition was originally described by Rees in 1947[4]

The typical age of presentation is in the 50s to 60s, with males more likely to be affected.[5] The commonest site is the mandibular posterior region. CSO can develop without an intervening acute phase. Some suggest that osteomyelitis must be present for atleast 1 month before it is termed 'chronic', as this suggest that disease is refractory to the host defence, or to initial therapy usually oral antibiotics.

Case Report

A female patient aged of 35 years was reported to our department of Oral and Maxillofacial surgery with chief complaint of pain and swelling in the lower left posterior region of jaw and face since 2 months. Mouth opening was not hampered. On Specific testing there was paresthesia of the left lower jaw.

History revealed that swelling was gradual in onset and slowly increased, but it decreased after pus discharge. Patient had undergone extractions of lower left 2nd premolar and 1st molar 3 months ago. Medical history was not contributory in this case. Cervical

lymphadenopathy and regional paresthesia was also present. On intraoral clinical examination, pus discharge was seen in extraction socket of left mandibular 1st molar. There was mild appreciable swelling present on buccal aspect of left mandibular 2nd molar. This area was also slightly tender on palpation.

Routine preoperative investigation were performed. A panoramic radiograph was taking which revealed multilocular radiolucency with ill-defined borders which gave a typical " moth eaten " appearance. This extended upto the inferior border of the mandible.

Bone biopsy was performed under local anesthesia. Histopathological investigations revealed a non specific inflammatory cell infiltration in the bone. Based on case history, clinical, histopathological and radiological finding, the provisional diagnosis was chronic suppurative osteomyelitis. Immediate treatment was started with empirical antibiotic (amoxicillin + potassium Clavulanic acid t.d.s for 7 days + metronidazole t.d.s for 7 days). Aggressive surgical treatment as sequestrectomy and decortication was planned along with reinforcement of mandible using a reconstruction plate. Surgery was planned under general anesthesia. Under proper surgical protocol , the pathology was exposed intra orally and decortication was done with help of bone rongeur and rotary bone cutting instrument. At the same time sequestrectomy and curettage was also done. Extraction was done with lower left second molar. A reconstruction plate was placed (8 hole continuous plate which was secured by 2x8mm screws). Closure was done with 3-0 vicryl and metronidazole soaked gauze dressing was placed. Excised specimen was send to histopathology department.

Post operative antibiotic therapy was given for four weeks. Patient responded well to both antibiotic as well as surgical treatment. Healing over surgical area was uneventful. Histopathological report confirmed the final diagnosis as Chronic Suppurative Osteomyelitis. Post-operatively patient was on doxycycline(o.d) for a month. Constant follow up was maintained. It was found radiographically that after aggressive treatment and good nutrition (involving high protein diet), there was regeneration of bone in that region after 6 months. Clinically and radiographically there was no sign of residual infection reported after 3 months and 6 months.

Discussion

Osteomyelitis is an inflammation of the medullary portion of bone. However the process is rarely confined to endosteum.[6] It usually encompasses the cortical bone and periosteum as well. Therefore, osteomyelitis may be considered as an inflammatory condition of bone that begins as an infection of the medullary cavity and haversian system and extends to involve the periosteum of the affected area. The infection becomes established in the calcified portion of bone when pus in the medullary cavity or beneath the periosteum destructs the blood supply. Following ischemia the infected bone becomes necrotic.[7]

Classification (Hudson's) [8]

1. **Acute osteomyelitis**

a. Contiguous focus
b. Progressive
c. Hematogenous

2. **Chronic osteomyelitis**

a. Recurrent multifocal
b. Garré's
c. Suppurative or nonsuppurative
d. Sclerosing

Pathogenesis

The primary cause of chronic osteomyelitis of the jaws is infection by odontogenic microorganisms.[9] It may also arise as a complication of dental extractions and surgery, maxillofacial trauma and the subsequent inadequate treatment of a fracture, and/or irradiation to the mandible.[10]

Very often, as with any infection, the patient with osteomyelitis of the maxillofacial region will present with classic symptoms:

Pain, swelling and erythema of overlying tissues, adenopathy, fever, paresthesia of the inferior alveolar nerve,trismus, malaise,fistulas[11].

The successful treatment for osteomyelitis is based on

- Early diagnosis
- Drainage of pus
- Bacteriological culture and sensitivity
- Appropriate antibiotic therapy
- Supportive therapy
- Surgical debridement
- Reconstruction when indicated
- Adjunct Hyper Baric Oxygen therapy. [9-10]

Selecting antibiotics is based on identified bacteria from culture sensitivity test, but empirical antibiotics started as early as possible. Penicillin remain drug of choice for osteomyelitis [12] ,but penicillinase resistant penicillin, clindamycin, cephalosporines are also used.

Surgical management as an adjunct to medical treatment usually is necessary. The goal of surgical intervention is to disrupt the infectious foci and removal of necrotic bone or sequesra.[13]

Treatment mainly involves decortication and sequestrectomy.

Sequestrum is avascular, therefore poorly penetrated by antibiotics. Which leads to progression of bone destruction. Once the sequestrum has formed completely, it can be removed with a minimum of surgical trauma, which is known as sequestrectomy.[1,14]

Decortication refers to the removal of chronically infected cortex of bone. Which brings reflected buccalmucoperiostealflap closer to the medullary cavity , thus facilitate the healing process.[15]

In present case patient was prescribed antibiotics (doxycycline) for 28 days and high nutrient diet after surgical procedure by means of which the treatment was successful.

Dietary changes alone, though an important consideration when treating osteomyelitis, may be seriously insufficient in resolving bone infection. Diet and nutrition can be an important aspect of a well-rounded osteomyelitis treatment plan. Foods that contain significant amounts of vitamins A, C and E, selenium and zinc may be helpful in treating this health problem.[16,17] Probiotics like acidophilus may also be beneficial in treating osteomyelitis.[18] Avoiding alcohol and increasing consumption of fresh fruits and vegetables, whole grains and fish are important general dietary strategies in treating this condition.[19.20]

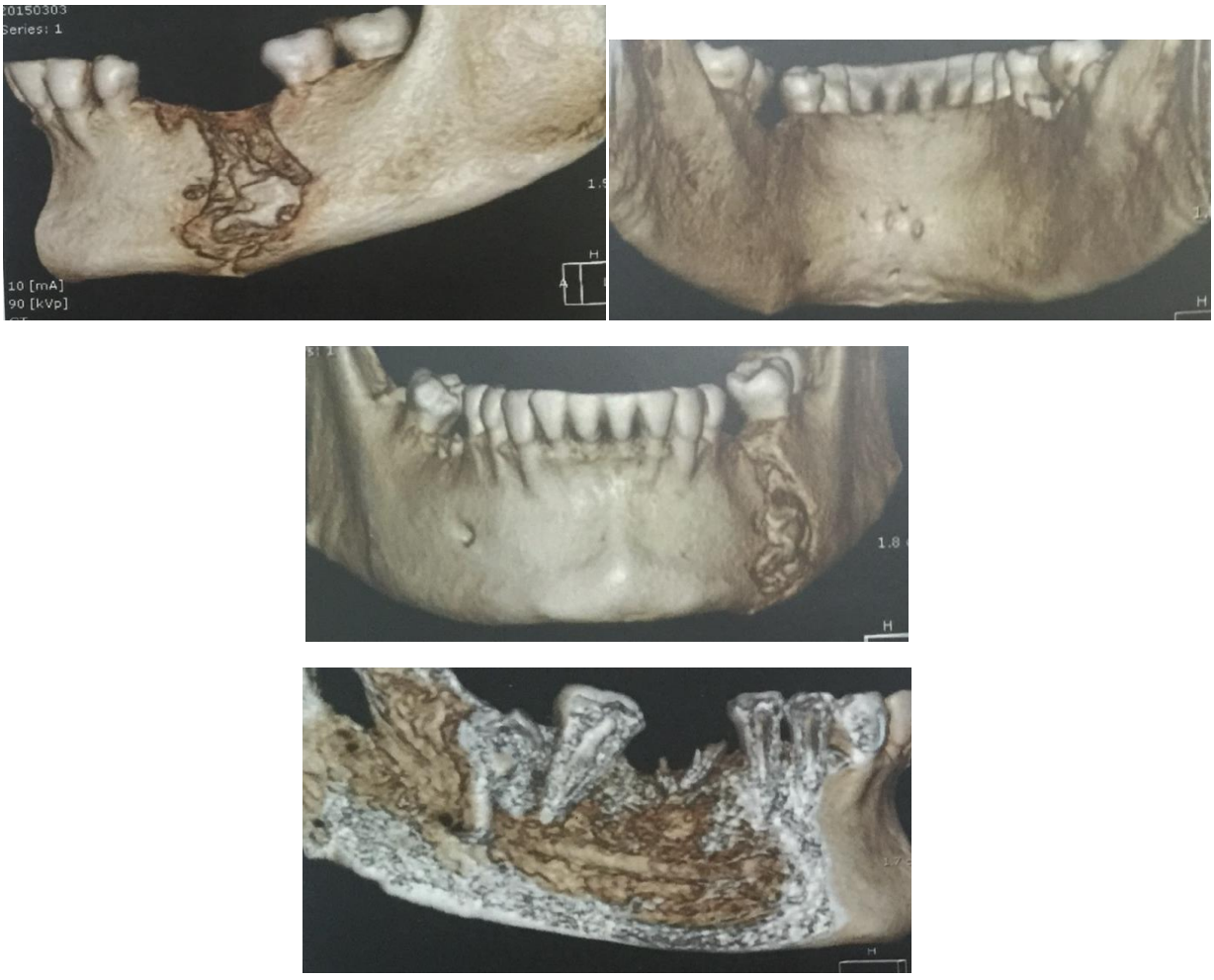


Fig 1: Pre operative CBCT scan

Fig 2: Intra operative photograph after initial saucerization.

Fig 3:Reconstruction plate

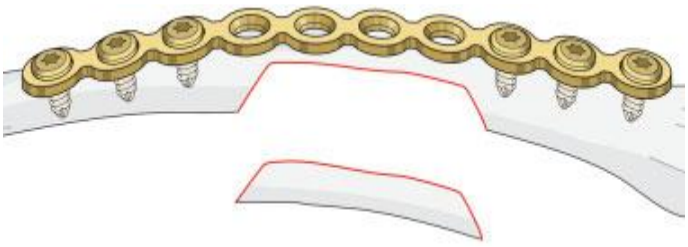


Fig 4: Reconstruction plate used to abut the weakened section of the bone following removal of pathology using AO principles of rigid internal fixation with three screws each on either side.

Fig 5: Specimen sent for histopathology lab.

Fig 6: Post operative 5 days

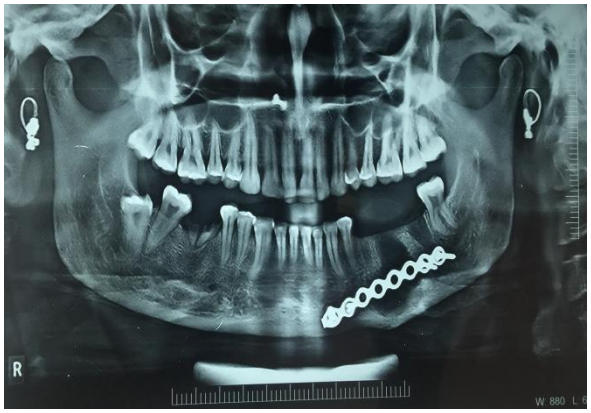


Fig 7: Three month post operative op

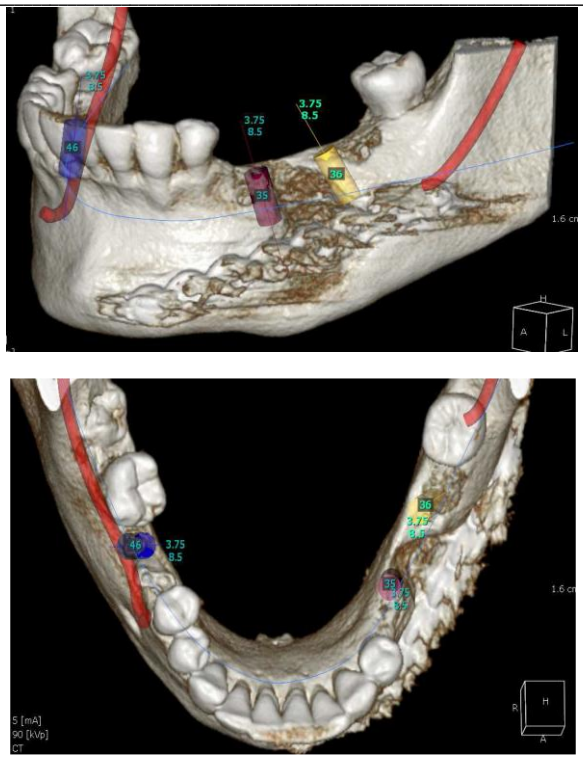


Fig 8: Six month post operative CBCT

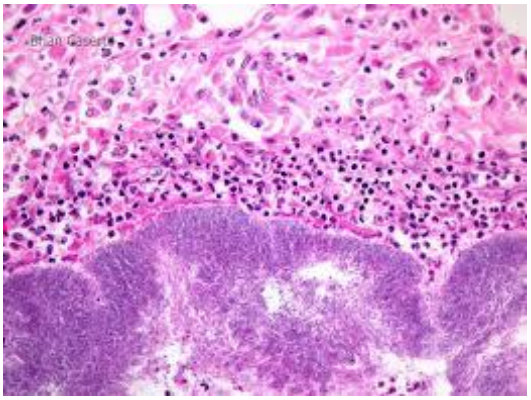


Fig 9 Histopathology showing osteoclast resorption with multiple adjacent Howship lacunae.

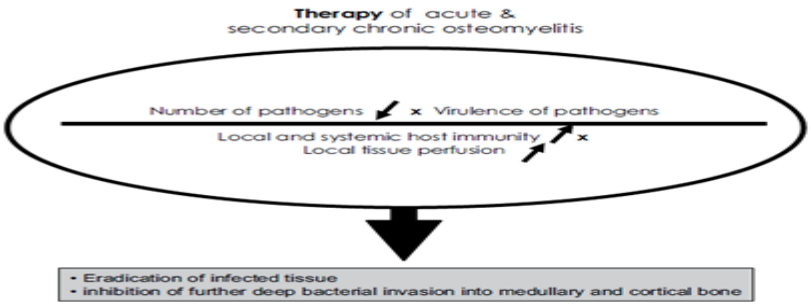
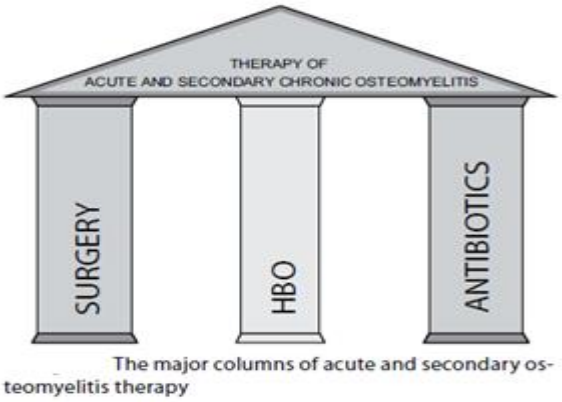


Fig: 9 Mechanisms in treatment of acute and secondary chronic osteomyelitis of the jaws



The major columns of acute and secondary osteomyelitis therapy

Fig 10 Therapeutic goals in treatment of acute and secondary chronic osteomyelitis of the jaws

Eradication of infection and removal of infectious focus
Pain management
Limitation of further spreading of the disease
Fracture prophylaxis, and stabilization of infected fractures
Preservation of anatomic structures when possible
Prevention of relapse of disease
Prevention of (further) chronification of the infection
Reestablishment of anatomy and function

Fig: 10 and 11 [20]

Conclusion

Osteomyelitis and osteoradionecrosis present an ongoing and potentially difficult clinical scenario to manage. Many patients receive a combination of surgical and medical management to adequately heal these diseases. Some patients will be required to undergo extensive and potentially disfiguring surgery to manage this disease. The medical management, including antibiotic therapy and HBO treatment, may be expensive, time consuming, and disruptive to the patient's life. Nutrition plays a very vital role in recuperation of the patient after such surgeries.

Both of these conditions can stem from something as innocuous and common as a dental extraction.

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