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"Hidden Infection Beyond Tooth Infection – A Case Report "

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KEYWORDS

Chronic osteomyelitis,mandible,sequestrum,pain,swelling, sinus tract

ABSTRACT:

Introduction Osteomyelitis is an inflammatory disorder of bone characterized by an initial infection of the medullary cavity, followed by rapid extension through the Haversian systems and subsequent involvement of the periosteum in the affected regions. Case Report- A 32 year old female patient presented with a complaint of pain and swelling in lower left back region of jaw, previous history of extraction diagnosed as Chronic Osteomyelitis of left mandible. Conclusion- Despite therapeutic advancements, optimal management relies on meticulous assessment of clinical presentation and radiologic findings. A thorough understanding of the disease's pathophysiology, coupled with ongoing monitoring of treatment response on a case-by-case basis, is essential.

1. Introduction

The term *osteomyelitis* was introduced in 1852 by the French surgeon Edouard Chassaignac. It is derived from the Greek roots *osteon* (bone), *myelon* (marrow), and *itis* (inflammation), collectively denoting an inflammatory process involving bone and bone marrow[1]. Osteomyelitis an inflammatory condition of the long bones or bone marrow after an operation or trauma, commonly in bones involving bone marrow. Osteomyelitis is characterized by lytic, sclerotic and hyperostotic lesions. [2]. Osteomyelitis is an inflammatory disorder of bone characterized by an initial infection of the medullary cavity, followed by rapid extension through the Haversian systems and subsequent involvement of the periosteum in the affected regions[3]. Multiple microorganisms implicated in osteomyelitis of the jaws including *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Peptostreptococcus*, *Fusobacterium*, and *Prevotella* species have been identified as

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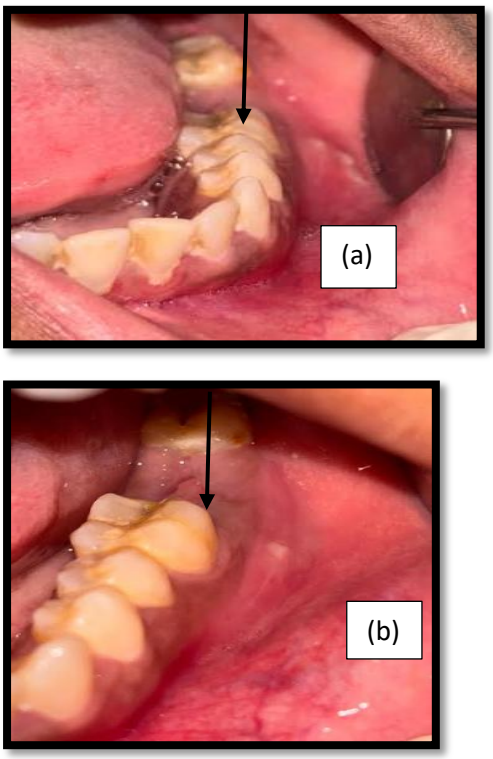
common etiologic agents of odontogenic infections, it can also occur due to systemic conditions like diabetes , anaemia, osteoporosis, fibrous dysplasia, etc can aggrevate due to personal habits like smoking and consumption of alcohol. Historically, this condition was associated with high mortality and unfavorable patient outcomes; however, its incidence and prognosis have markedly improved with the introduction of antibiotic therapy, enhanced oral hygiene practices, and advances in contemporary treatment modalities[4]. The prevalence and incidence of osteomyelitis affecting the jawbones show considerable global variation, influenced by geographic distribution, demographic characteristics of populations, the diversity of causative microbial pathogens, and the systemic health status of affected individuals. Osteomyelitis of the jaw requires prompt and careful clinical management because of its potential to result in serious complications, including sepsis, cellulitis, life-threatening infections, pathological fractures, orocutaneous fistula formation, functional deficits, septic shock, and multiorgan failure[5]. To avoid such complications it is of utmost importance to recognize the early signs and symptoms and to treat any cas of osteomyelitis we require a multidisciplinary approach.

Case Report

A 32 year old female patient presented with a complaint of pain and swelling in lower left back region of jaw since 1 month. She gave history of pain and swelling with the same region before and after extraction for which she was given medications by a private dental practitioner Patient underwent atraumatic extraction 1 week before visiting the Department of Oral Medicine and Radiology. She had completed the course of antibiotics therefore the time come to the department the swelling was reduced but pain and swelling still persisted.

Clinical examination revealed a well-defined swelling involving 34-38 region with sinus tracts. Palpatory findings revealed buccal vestibule obliteration w.r.t 34-38 region with tenderness positive.



(a)Swelling seen in buccal vestibule w.r.t 36

(b)Sinus tract seen w.r.t36

Based on clinical findings provisional diagnosis given was Chronic Osteomyelitis with left mandibular region with cemento-osseous dysplasia as differential diagnosis.

Following clinical examination, Radiographic Investigations were done where in OPG and CBCT revealed Radiopaque-radiolucent lesion i.e peripheral radiolucency with centralized (calcific) radiopacity w.r.t 36 (sequestra formation is seen with sclerosing peripheral radiolucency) and this lesion extended from 33- 38 region with break in the continuity of buccal and lingual cortical plates at multiple sites involving the inferior alveolar nerve depicted in the following figures.

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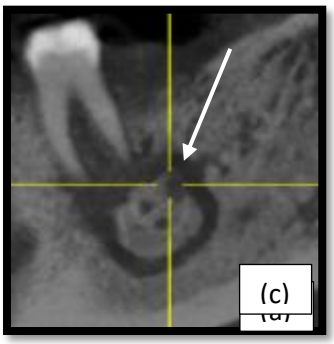
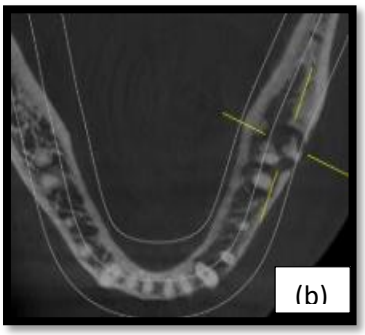
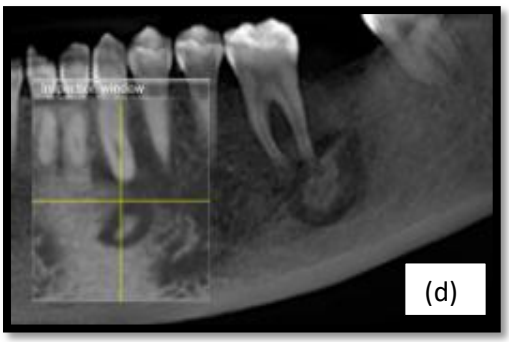


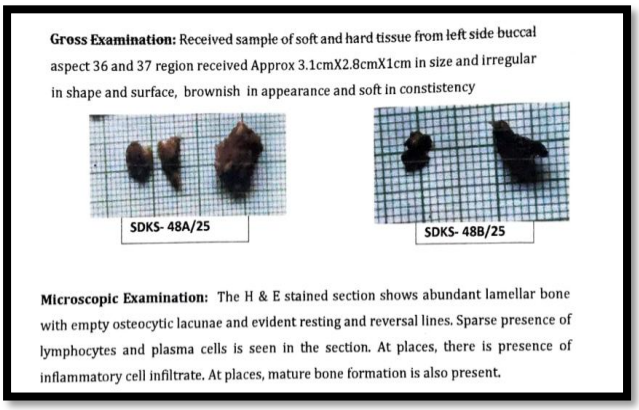


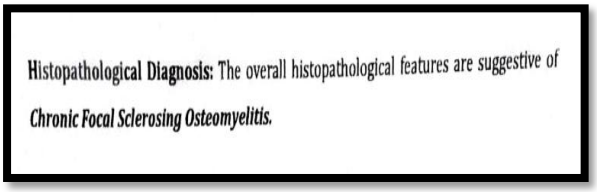


(a) &(d)Sequestrum seen w.r.t36
(b) & (c)Discontinuity seen in buccal and lingual cortical plates

Combining the clinic-radiographic features diagnosis given was Chronic osteomyelitis with left mandibular jaw.

Biopsy Report





A biopsy specimen was taken foe histopathological investigation where the specimen under microscope revealed small bony trabeculae with little intestitial marrow tuissu, few trabeculae shows empty osteocytic lacunae. The surrounding connective tissue composed of chronic inflammatory cell infiltrate mostly lymphocytes with few bundles of collagen fibres, dilated capillaries, extravasated RBC's and few areas of necrotic debris. Giving it a final diagnosis of **Chronic Osteomyelitis of the left mandibular jaw.** For which the patient underwent surgical procedure i.e Sequestromy along with surgical extraction with 36 as a treatment.

Follow up OPG was taken healing i.e bone formation can be seen w.r.t lower left mandible.

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2. Discussion

Chronic osteomyelitis is a persistent inflammatory disorder of bone marked by necrosis of both mineralized matrix and medullary tissues. Its development is influenced by the virulence of the infecting microorganism and the effectiveness of the host's immune defense mechanisms[6].
When it come to chronic osteomyelitis bone necrosis results in the formation of a sequestrum, which becomes encased by newly formed reactive bone termed the involucrum, all embedded within a bed of granulation tissue[7].

Effective management of osteomyelitis is founded on thorough history taking and detailed clinical examination. These essential measures are further supported by pus culture, sensitivity testing, and antibiotic susceptibility assays, which are critical for pathogen identification, therapeutic guidance, and prevention of systemic complications such as sepsis[8].

In the era of advanced medical care, the overall prevalence of conditions such as osteomyelitis has become uncommon, with involvement of the maxillofacial skeleton being particularly rare. Within this already limited spectrum, osteomyelitis of the maxilla represents an exceptionally infrequent clinical entity that may occasionally present in the outpatient setting. Diagnosis is often challenging, as the condition can mimic or be associated with factors such as hematogenous spread of infection, trauma, and immunocompromised states, including diabetes mellitus, malignancy, and malnutrition[9,10].

Osteomyelitis of the jaw is generally attributed to three primary etiologies: traumatic, often following road traffic accidents or iatrogenic/hospital-acquired injury; rhinogenic origin; and odontogenic infections[11].
According to research, approximately 70% of maxillary osteomyelitis cases are linked to diabetes mellitus. Hyperglycemia in these patients compromises immune function and disrupts vascular supply to the maxilla, predisposing to infection[12].

Several pathologies can clinically and radiographically mimic jaw osteomyelitis, including osteosarcoma, Langerhans cell histiocytosis, squamous cell carcinoma, and fibrous dysplasia. These conditions often present with bone destruction and periosteal reaction, complicating the differential diagnosis of osteomyelitis[13].

Osteomyelitis of the jaw requires a high index of suspicion and timely diagnosis, as it often remains undetected for extended periods. Comprehensive clinical evaluation, radiographic and hematological investigations, and histopathological analysis constitute the main diagnostic modalities. Acute infections are typically associated with elevated neutrophil and leukocyte counts. Biopsy may be indicated to exclude malignancies or other pathologies that can clinically resemble osteomyelitis[14,15].

Conservative management of osteomyelitis includes hyperbaric oxygen therapy, systemic antibiotics, bisphosphonates, and adjunctive use of muscle relaxants. When these non-surgical interventions fail to maintain bone integrity, surgical approaches such as decortication, bone grafting, or partial to segmental resection may be indicated[16].
Management of osteomyelitis should be prompt and assertive to prevent progression of the disease. The therapeutic objectives include enhancing host immune response, providing targeted antibiotic therapy, and surgically debriding necrotic bone

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tissue, followed by closure of the operative site. Recommended antibiotic regimens may include agents such as amikacin, metronidazole, and linezolid[17].

Conclusion

Early recognition and appropriate antimicrobial therapy are critical in osteomyelitis to prevent extensive osseous and dental destruction. Nonetheless, surgical intervention for abscess drainage and excision of necrotic bone frequently remains necessary. Despite therapeutic advancements, optimal management relies on meticulous assessment of clinical presentation and radiologic findings. A thorough understanding of the disease's pathophysiology, coupled with ongoing monitoring of treatment response on a case-by-case basis, is essential. Clinical case studies underscore that prompt diagnosis significantly enhances treatment outcomes and can reduce the extent of required surgical intervention.

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