osteomyelitis

Acute osteomyelitis:

Etiology

Acute inflammation of the bone and bone marrow of the mandible and maxilla most common causes are

1. Extension of a periapical abscess

2. Physical injury (fracture or surgery)

3. Bacteremia.

Most cases of acute osteomyelitis are infectious (staphylococci and streptococci are identified most often).

Clinical features:

Pain

Pyrexia

Tender lymphadenopathy

Paresthesia of the lower lip occasionally occurs with mandibular involvement.

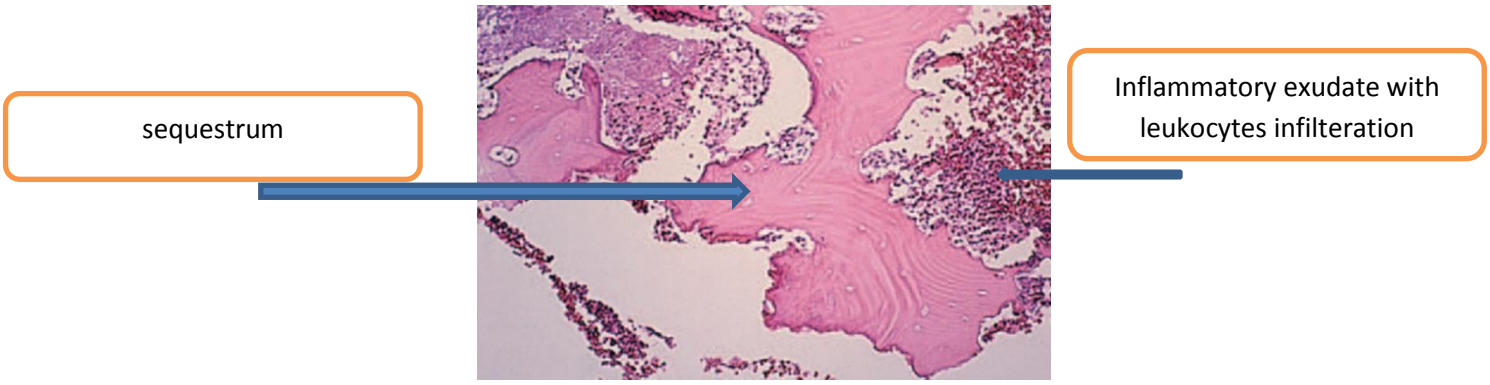
Radiographical features:

Radiographical changes occur when more than 60% of the bone have been resorbed. Over time, diffuse radiolucent changes begin to appear as more bone is resorbed and replaced by infection.

Ill-defined area of radiolucency of the right body of the mandible.

Histopathology

A purulent exudate occupies the marrow spaces in acute osteomyelitis. Bony trabeculae show reduced osteoblastic activity and increased osteoclastic resorption. If an area of bone necrosis occurs (sequestrum), osteocytes are lost and the marrow undergoes liquefaction.



Treatment

1. Antibiotics
2. Drainage.
3. Surgery may also be performed and ranges from (simple sequestrectomy to excision with autologous bone replacement).

Each case treated according to severity and causative organism

Chronic Osteomyelitis (Chronic Osteitis)

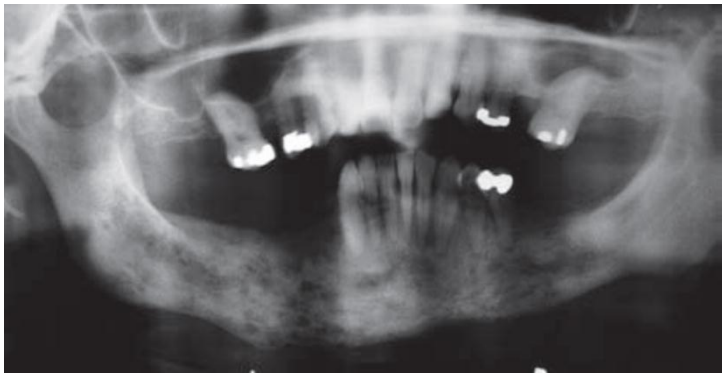
Etiology:

Most cases are infectious, and, as in most infections, the clinical presentation and the course are directly dependent on the virulence of the microorganism involved and the patient's resistance. The anatomic location, immunologic status, nutritional status, and patient's age, as well as the presence of preexisting systemic factors, such as Paget's disease, osteopetrosis and others.

Clinical Features

- The mandible is affected more commonly than the maxilla specially the molar area. (due to the more diffuse blood supply and the greater proportion of cancellous bone in the maxilla).
- Pain of variable intensity.
- The duration of symptoms is generally proportional to the extent of disease. Swelling of the jaw is a commonly encountered sign; loose teeth and sinus tracts are seen less often.
- Anesthesia is very uncommon.

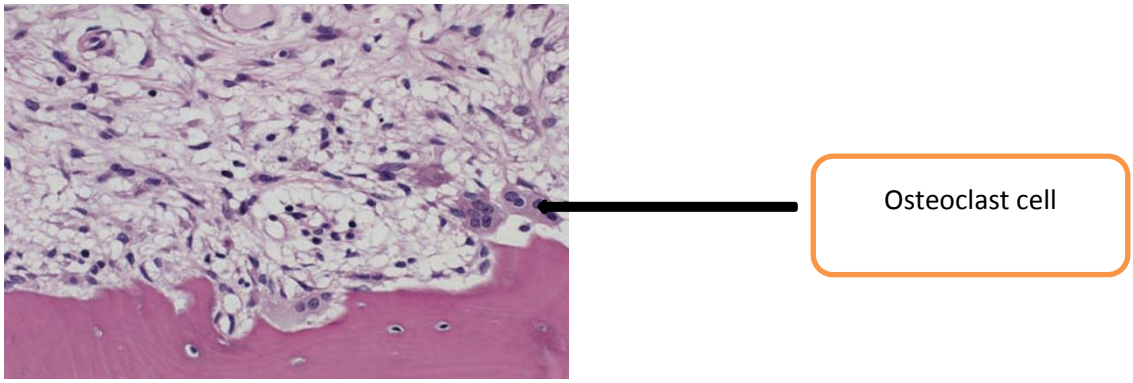
Radiographically, chronic osteomyelitis appears primarily as a radiolucent lesion that may show focal zones of opacification. The lucent pattern is often described as moth-eaten because of its mottled (spotted) radiographic appearance. The lesion margins are often indistinct.



Histopathology

Mild chronic osteomyelitis: A few chronic inflammatory cells (lymphocytes and plasma cells) are seen in a fibrous marrow. Both osteoblastic and osteoclastic activity may be seen, along with irregular bony trabeculae. Differential diagnosis: fibro-osseous lesions such as ossifying fibroma and fibrous dysplasia.

In advanced chronic osteomyelitis: necrotic bone (sequestrum) may be present. Reversal lines reflect the waves of deposition and resorption of bone. Inflammatory cells are more numerous and osteoclastic activity more prominent than in mild cases.



Treatment:

The basic treatment of chronic osteomyelitis centers on the selection of appropriate antibiotics and the proper timing of surgical intervention. Culture and sensitivity testing should be carried out. Occasionally, combinations of antibiotics may be more successful than single agents. The duration of antibiotic administration may be relatively extended.

Chronic Osteomyelitis with Proliferative Periostitis (periostitis ossificans)

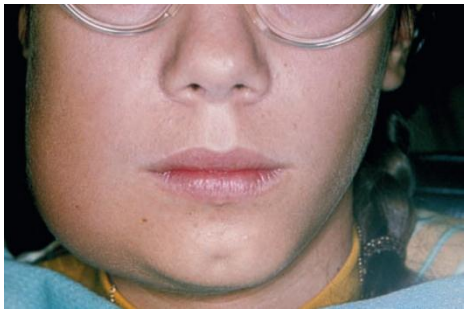
Etiology:

is a subtype of osteomyelitis that has a prominent periosteal inflammatory reaction as an additional component. It most often results from periapical abscess of a mandibular molar

tooth, or from infection associated with tooth extraction or partially erupted molars. It is most common in children.

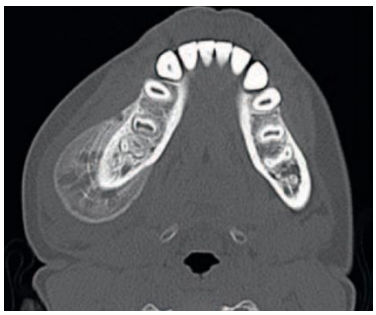
Clinical Features

Uncommon type. In the head and neck area, it is seen mostly in the mandible. It typically involves the posterior mandible and usually is unilateral. Patients characteristically present with an asymptomatic bony, hard swelling with normal-appearing overlying skin and mucosa. On occasion, slight tenderness may be noted. This presentation necessitates differentiation of this process from benign mandibular neoplasms. Radiographs and a biopsy provide a definitive diagnosis.



Chronic Osteomyelitis with Proliferative Periostitis

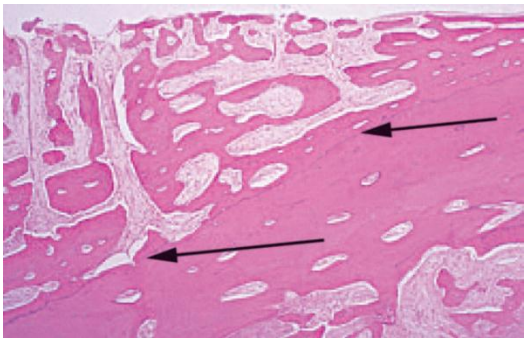
Radiographically, the lesion appears centrally as a mottled, predominantly lucent lesion in a pattern consistent with that of chronic osteomyelitis. The feature that provides the distinctive difference is the periosteal reaction. This, best viewed on an occlusal radiograph, appears as an expanded cortex, often with concentric or parallel opaque layers. Trabeculae perpendicular to the onion-skin layers may also be apparent.



(CT) image
demonstrating new periosteal bone growth with onionskin laminations.

Histopathology

biopsy is not required unless the clinical diagnosis is in question. Specimens often reveal parallel rows of highly cellular and reactive woven bone in which the individual trabeculae are frequently oriented perpendicular to the surface. The trabeculae sometimes form an interconnecting meshwork of bone or are scattered more widely, resembling the pattern seen in immature fibrous dysplasia. Between the cellular trabeculae, relatively uninflamed fibrous connective tissue is evident. Sequestra, if included, demonstrate the typical features of bone necrosis.



Interconnecting
trabeculae of new bone formation (top left) extending from the original cortical surface (delineated by arrows).

Treatment and prognosis

extraction of the offending tooth or appropriate endodontic therapy) is directed toward eliminating the source of the infection. After the focus of infection has been eliminated and inflammation has resolved, the layers of bone will fuse in 6 to 12 months as the overlying muscle action helps to remodel the bone to its original state.