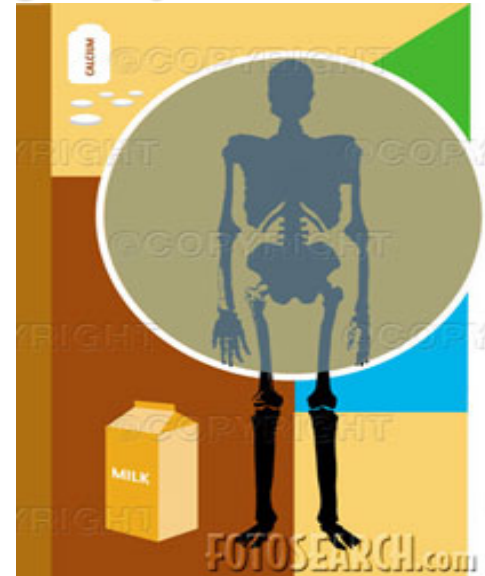


**Inflammatory
diseases of the bone**

General response of bone to injury

- Inflammation
- Necrosis
- Resorption
- Fracture



Inflammatory diseases of the bone

1.osteitis

2.osteomyelitis

3.periostitis

Osteitis: localized inflamm of bone with no progression through marrow space.

Periostitis: inflamm of periosteal surface of the bone & may or may not be associated with osteomyelitis.

Osteomyelitis: an extensive inflamm of the interior of the bone & spread to marrow space ,mostly develop as a result of odontogenic infection.

It is a common complication before the advent of antibiotics. Now it is rare.

Clinical types of osteomyelitis

▶ 1 – Acute suppurative osteomyelitis

Source of infection = an adjacent focus of infection associated either with:–

- Teeth--Dental abscess, ANUG, Pericoronitis
- Local trauma--Jaw fracture, Penetrating wound, gunshot wound

- Immunocompromised states (acute leukemia)
- Tobacco and alcohol abuse
- Poorly controlled diabetes mellitus
- Paget's & osteopetrosis (hypovascularized diseases)
- Malignancy - Malnutrition - Radiation

Clinical features

- Mandible mainly affected, **localized** in maxilla, **diffuse** in mandible
- Usually in adult males
- Severe ,throbbing , deep-seated pain
- Swelling of jaw
- Teeth in the area are tender , s.t become loose: gingivae are red and swollen
- Trismus is frequent (**due to M oedema**)
- Exfoliation of fragment of necrotic bone may be discovered
- Sometimes paraesthesia of the lip = involvement of IDC➔ alteration in N function
- Minimal systemic upset= **increase temperature, increased WBC count**

PATHOLOGY

Acute inflammation of marrow tissues

Spread of exudate along the marrow spaces

Thrombosis of vessels due to compression

Necrosis of bone

Liquefaction of necrotic tissues

Lifting of periosteum causing further necrosis

Finally ,Osteoclastic activity >>> SEQUESTRUM

Radiographically:

Early stages: no radiographic changes

After about **10 -14** days, radiographs show irregular area of RL with ill-defined margin. “**moth-eaten**” pattern of bone destruction



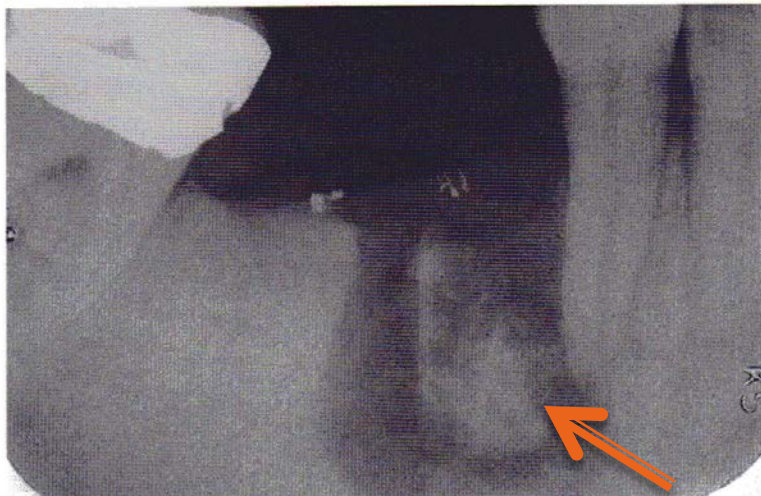
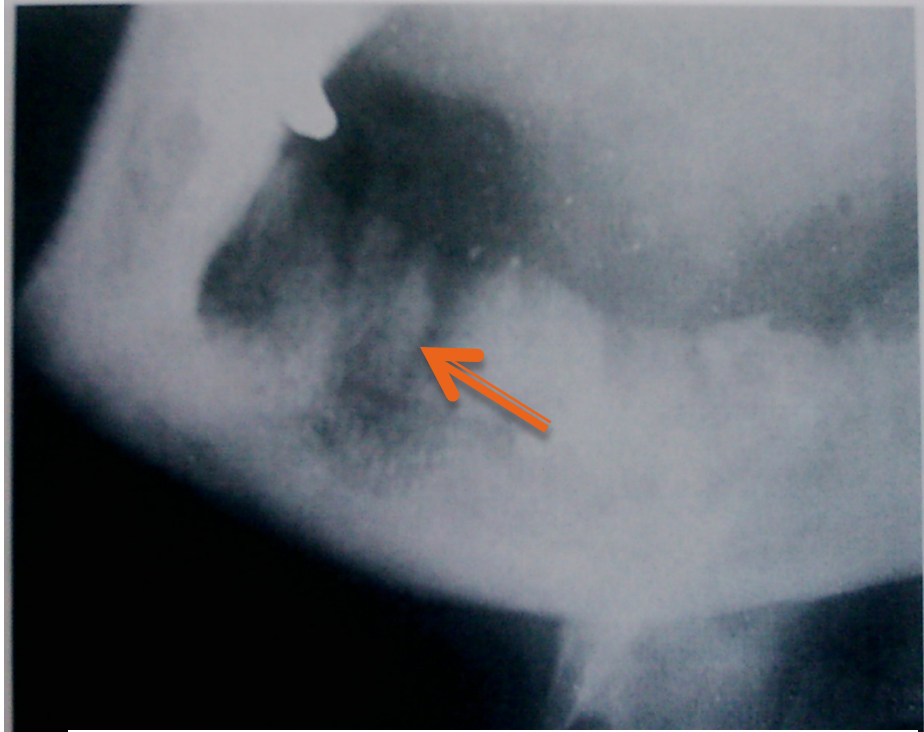


Figure 3-48 ♦ Acute osteomyelitis with sequestrum. Radiolucency of the right body of the mandible with central radiopaque mass of necrotic bone. (Courtesy of Dr. Michael Meyrowitz.)

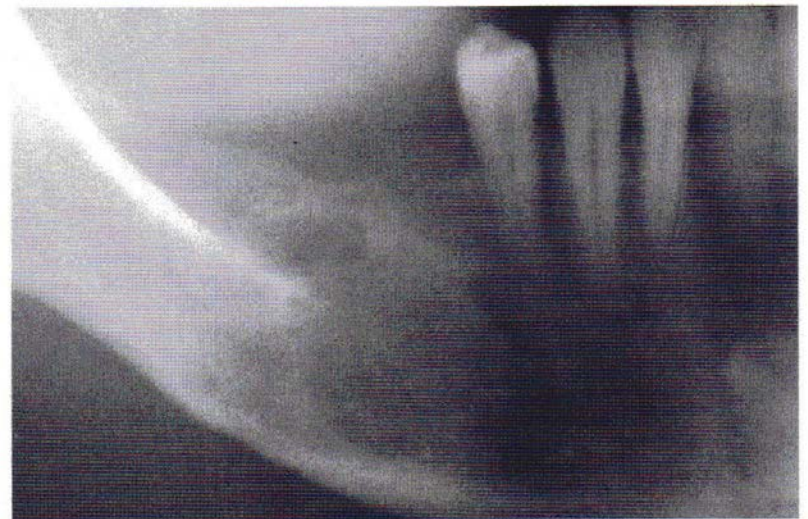


Figure 3-47 ♦ Acute osteomyelitis. Ill-defined area of radiolucency of the right body of the mandible.

Histopathology

- ▶ 1 – Bone necrosis:
 - Absence of osteocytes from their lacunar space
 - Replacement of marrow space by necrotic T
- ▶ 2 – Heavily infiltration with PMNL
- ▶ 3 – Peripheral resorption of necrotic bone
- ▶ 4 – Bact colonization

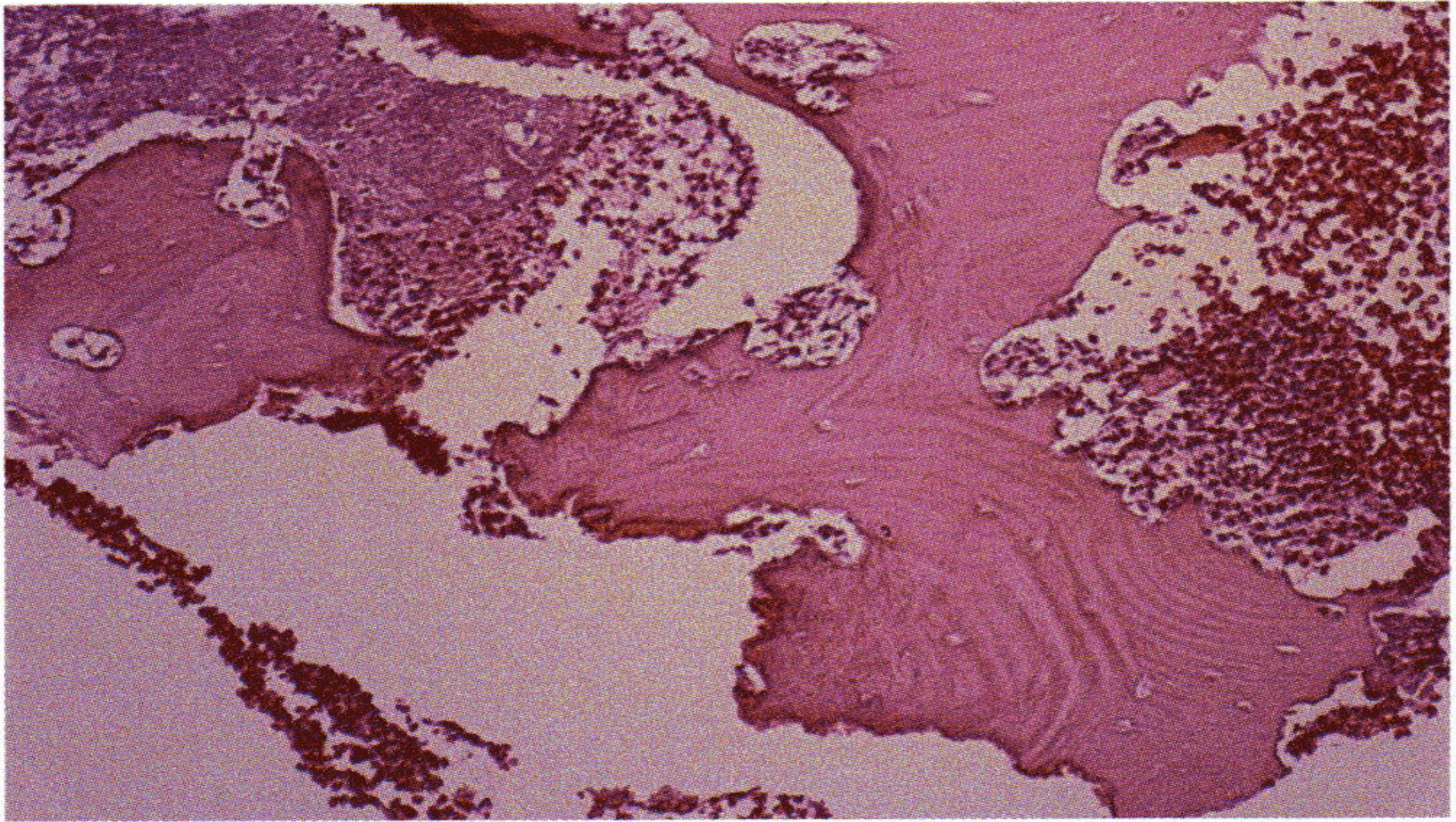


Figure 3-50 ♦ **Acute osteomyelitis.** Nonvital bone exhibits loss of the osteocytes from the lacunae. Peripheral resorption, bacterial colonization, and surrounding inflammatory response also can be seen.

Treatment

- ▶ Antibiotics (broad spectrum)---High dose
- ▶ Sedation & analgesics
- ▶ Incision & drainage
- ▶ Surgical removal of sequestrum
- ▶ Removal of infected tooth

Complication

- ▶ Destructive process → Pathological jaw fracture

ACUTE SUPPURATIVE OSTEOMYELITIS

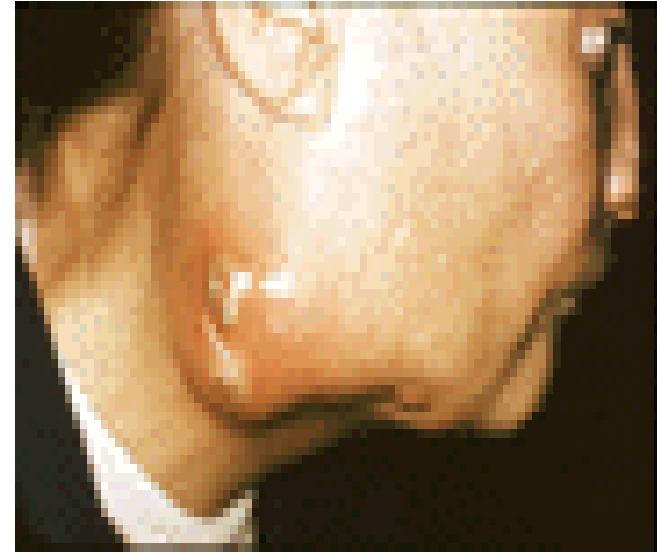
COMPLICATIONS

Rare but include:

- Pathological fracture → Extensive bone destruction.***
- Chronic osteomyelitis → Inadequate treatment.***
- Cellulitis → Spread of virulent bacteria.***
- Septicemia → Immuno-compromised patient.***

2- Chronic suppurative osteomyelitis

- ▶ Arise as a sequela of acute osteomyelitis or may arise *de novo*
(low grade infection, high resistance)
- Sign & symptom is of a mild form
- Clinically= Appearance of draining sinus (I.O or E.O)
Development of sequestrum
- Radiographically=patchy ,ragged & ill-defined RL ,often contains central sequestra



Chr. Focal Sclerosing Osteomyelitis

“ Sclerosing or condensing osteitis ”

- **Rare ,low-grade periapical infection or strong host defensive response**
- **Children and young adults , < 20 yrs**
- **Mostly mandibular first molar**
- **Large carious lesion, non-vital or pulpitis tooth**
- **No expansion of the jaw**
- **Asymptomatic, may be mild pain**

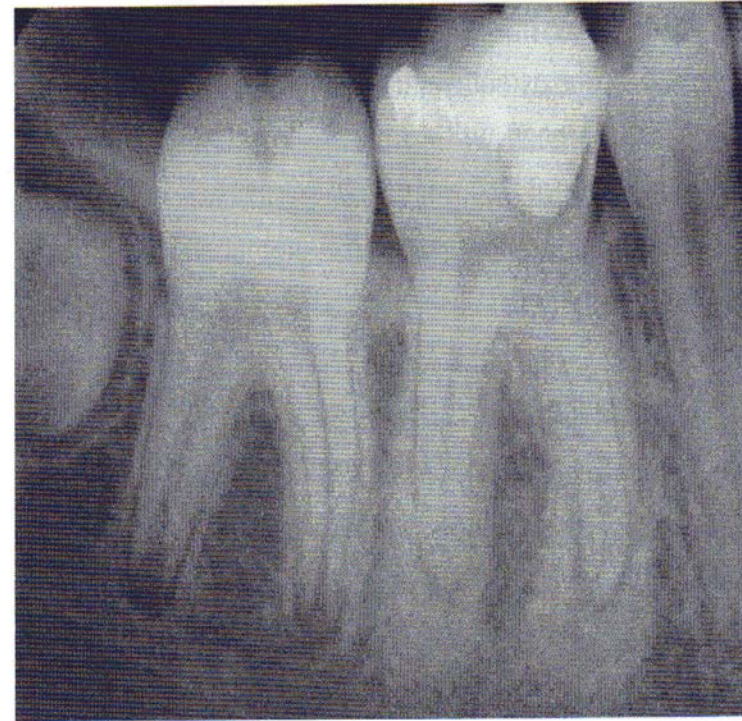
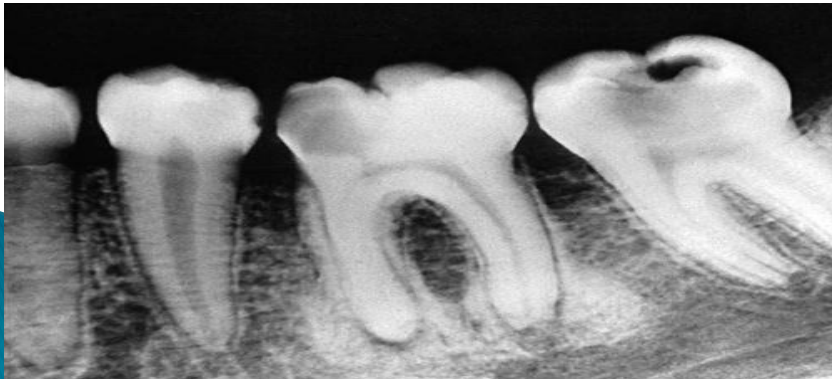


Figure 3-53 • Condensing osteitis. Increased areas of radio-density surrounding the apices of the nonvital mandibular first molar.

Pathology

- Dense sclerotic bone with scanty connective tissue & chronic inflammatory cells infiltrate mainly lymphocyte

Treatment

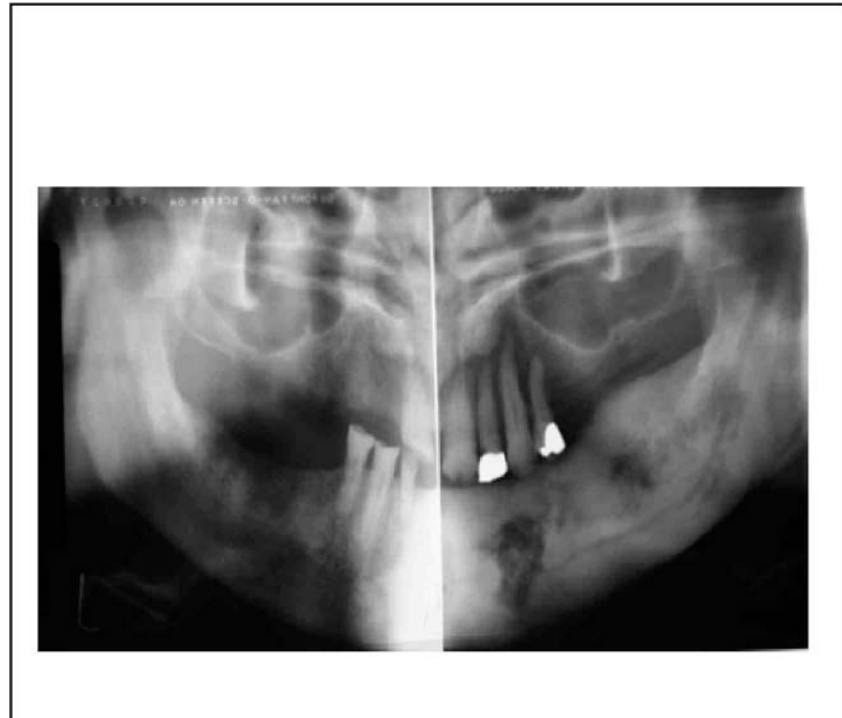
- Elimination of the source of inflammation by extraction or endodontic treatment

Residual area of condensing osteitis that remains after resolution of inflammation is termed as ----**Bone scar**



Chr. Diffuse Sclerosing Osteomyelitis

- May not be associated with carious teeth, the source of infection through the periodontal ligament (periodontitis, pericoronitis)
- Any age, mostly elderly patients
- Pain, if present, is often mild, no swelling
- No clinical sign& symptoms unless if there is an acute exacerbation → mild suppuration& fistula formation on mucosal surface to establish drainage



Radiographically:

Appears as a patchy diffuse or nodular sclerosis

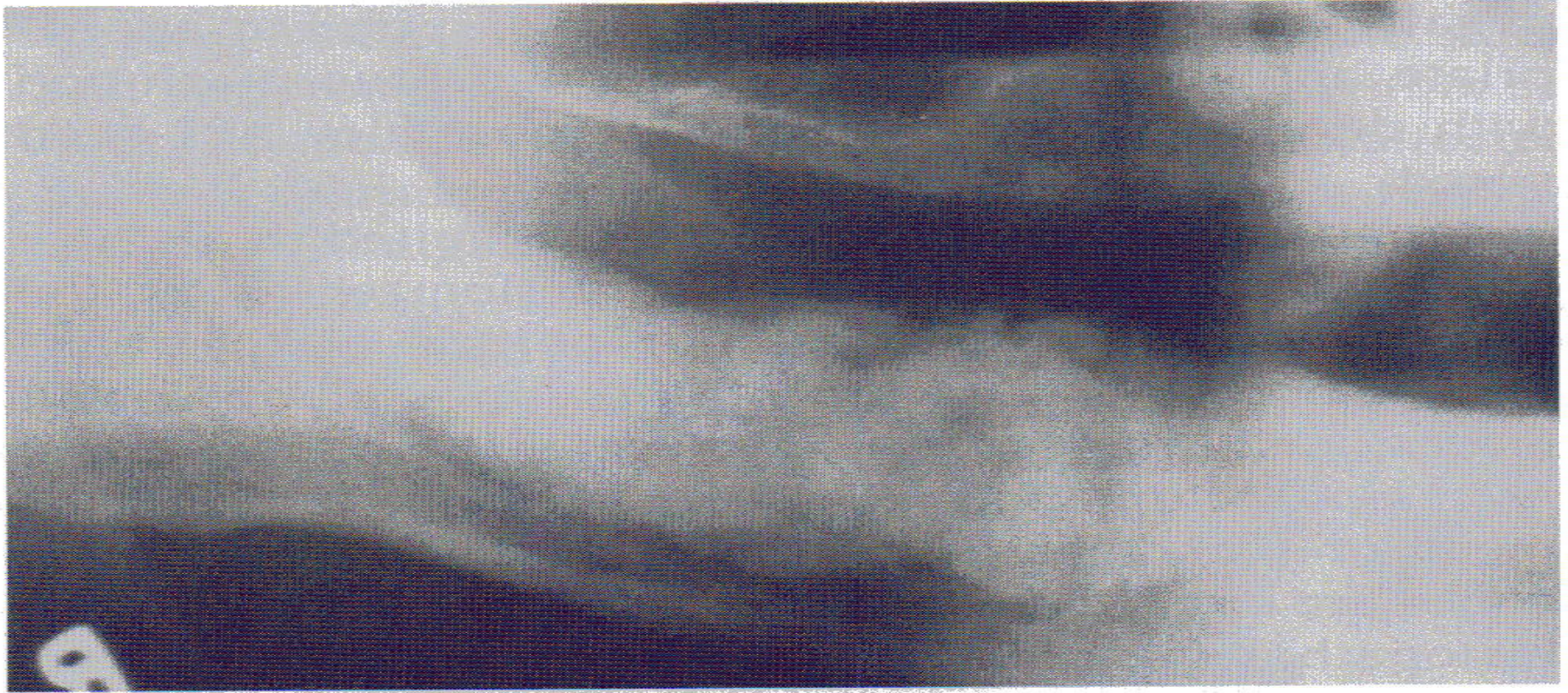


Figure 3-52 • **Diffuse sclerosing osteomyelitis.** Diffuse area of increased radiodensity of the right body of the mandible in the tooth-bearing area. No other quadrants were involved. (Courtesy of Dr. Louis M. Beto.)

3-Chronic osteomyelitis with proliferative periostitis(Garre's osteomyelitis, Periostitis ossificans)

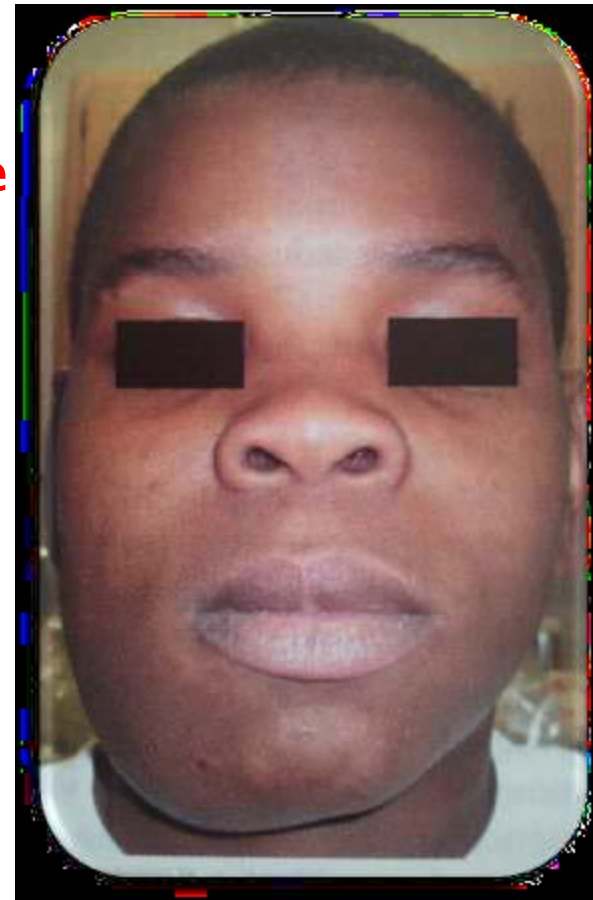
- ▶ Distinct clinicopathological entity characterized by a proliferative subperiosteal reaction rather than inflamm of the interior of the bone.

The affected periosteum forms several rows of reactive vital bone that are parallel to each other causing bone expansion

- ▶ Mainly in mandible (body), in children & young adult.

▶ Clinically=

- 1-Toothache
- 2- Jaw pain
- 3- Hard bony swelling on outer surface of the jaw
- 4- Carious tooth opposite the swelling



Radiographically

- ▶ Periapical film shows a periapical pathology.
(**Badly carious , non-vital tooth with PA lesion**)
- ▶ Occlusal film shows focal subperiosteal overgrowth of bone with a smooth surface on the outer cortical plate.



Figure 3-55 ♦ **Proliferative periostitis.** Radiopaque laminations of cortical bone parallel the cortex adjacent to inflammatory process of the mandibular bicuspid. (Courtesy of Dr. William Bechtold.)



Fig. 8.46 Proliferative periostitis: the discrete bony swelling of the left mandible is typical.

Histopathology

- ▶ Subperiosteal mass consisting of irregular trabeculae of actively forming woven bone .
{ They are parralel to each other & perpendicular to cortical plate }
- ▶ Scattered chronic inflamm cells in a fibrous marrow space.

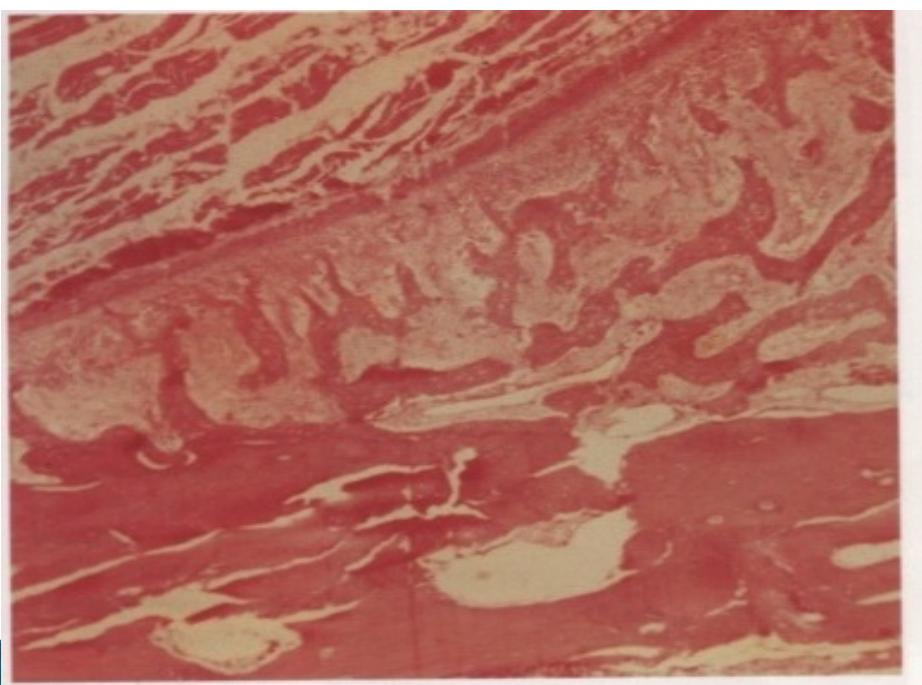


Fig. 8.45 Proliferative periostitis: low power view showing the periosteal proliferation and extensive reactive bone formation.

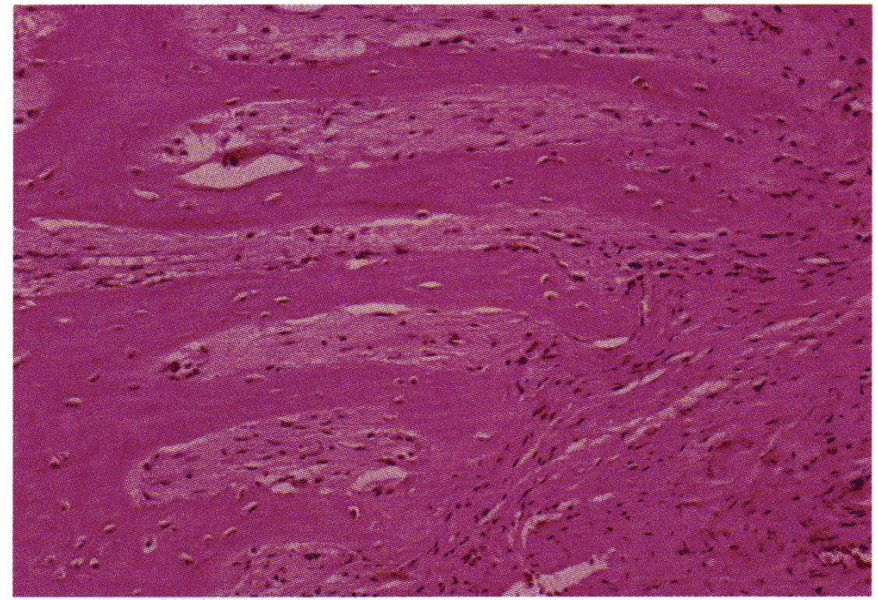


Figure 3-56 ♦ Proliferative periostitis. Cellular and reactive vital bone with individual trabeculae oriented perpendicular to the surface.

Treatment=

Removal of affected tooth
Surgical recountouring of
the affected area

Localized osteomyelitis (Alveolar osteitis , Dry socket)

- **The most common painful complication of dental extraction**
 - **Whitish lamina dura exposed in socket**
 - **Pain relieved by irrigation and repeated dressing of socket**
- Eventual healing of socket from its base by granulation tissue**

What is a dry socket?

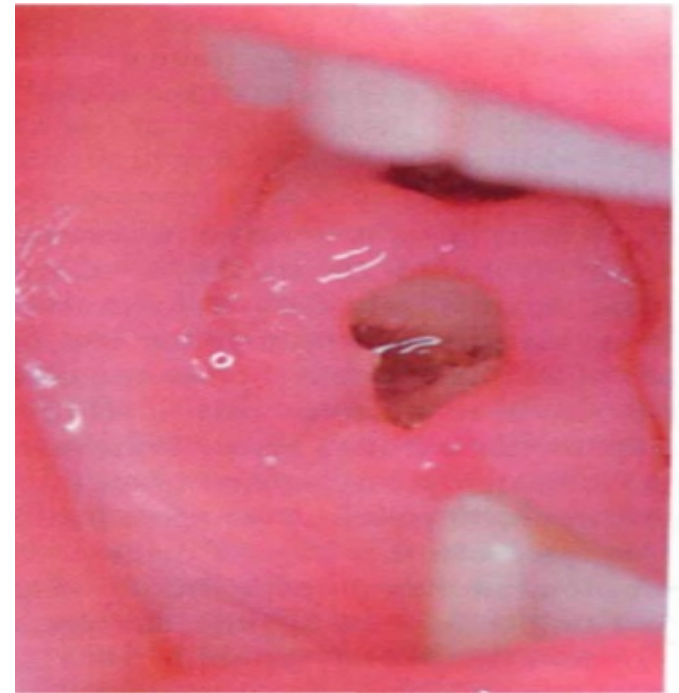
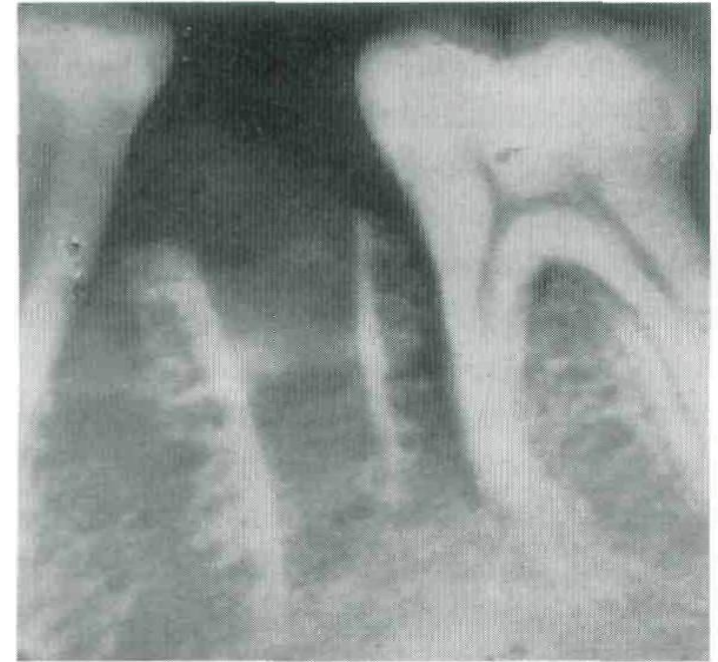
A dry socket is a fairly common complication of tooth extraction characterized by severe pain. It occurs when the tooth socket loses the blood clot that forms after a tooth is extracted and the bone inside the socket becomes exposed. It is one of the most painful dental problems one can experience. A dry socket is also referred to as alveolar osteitis.

Alveolar osteitis •

- Failure to form clot
- Dislodgment of clot
- Breakdown of clot

Dry Socket

- **Aetiology:**
 1. Excessive trauma.
 2. Impaired blood supply lower jaw > Upper jaw
 3. Local anaesthesia.
 4. Oral contraceptive (oestrogens component causes increase in serum fibrinolytic activity)
 5. Osteosclerotic disease.
 6. Radiotherapy.
 7. Smoking.



Treatment of Dry Socket

- Irrigate tissue with warm saline solution
- Pack extraction site with iodoform gauze
- Rx: analgesic and antibiotics
- Procedure repeated every one to two days

OSTEORADIONECCROSIS

Is a serious complication of radiation to head & neck region

Characterized by=

Painful chronic infection & necrosis

Sequestration

Permanent deformity

Mandible more than maxilla

Pathogenesis not understood=
3 factors involved

1- Radiation 2- Trauma

3- Infection



Histologically==Bone necrosis & sequestration.

- ▶ Unsuccessful treatment,, only conservative.
- ▶ AB & Analgesics
- ▶ Local debridement of sequestered bone
- ▶ Restoration , exo, perio treatment are done before radiation → **Maintain good O.H**
- ▶ Fl gel → reduce D. C (**Radiation caries**)

