BDS Year 4 Regular & Casual batch

Academic Year 2023-2024

Subject: Oral Medicine and Radiology

Topic: Inflammatory lesions of the jaws-I

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- Most common pathologic conditions of jaws
- Body responds to chemical, physical, or microbiologic injury with inflammation

Homeostasis

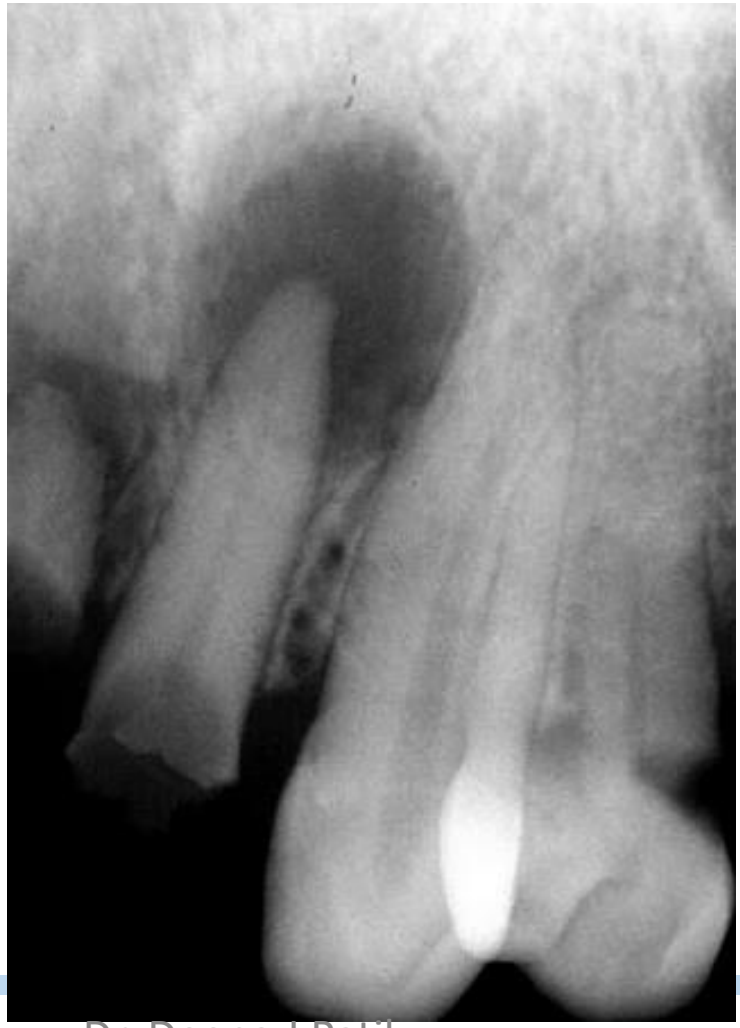
- Balance of osteoclastic bone resorption and osteoblastic bone production
- Mediators of inflammation tip this balance to favor either bone resorption or bone formation

- When the initial source of inflammation is a necrotic pulp and the bony lesion is restricted to the region of the tooth, the condition
- is called a periapical inflammatory lesion.

Periapical inflammatory lesion

- Source is necrotic pulp
- Lesion restricted to the region of the tooth

Example



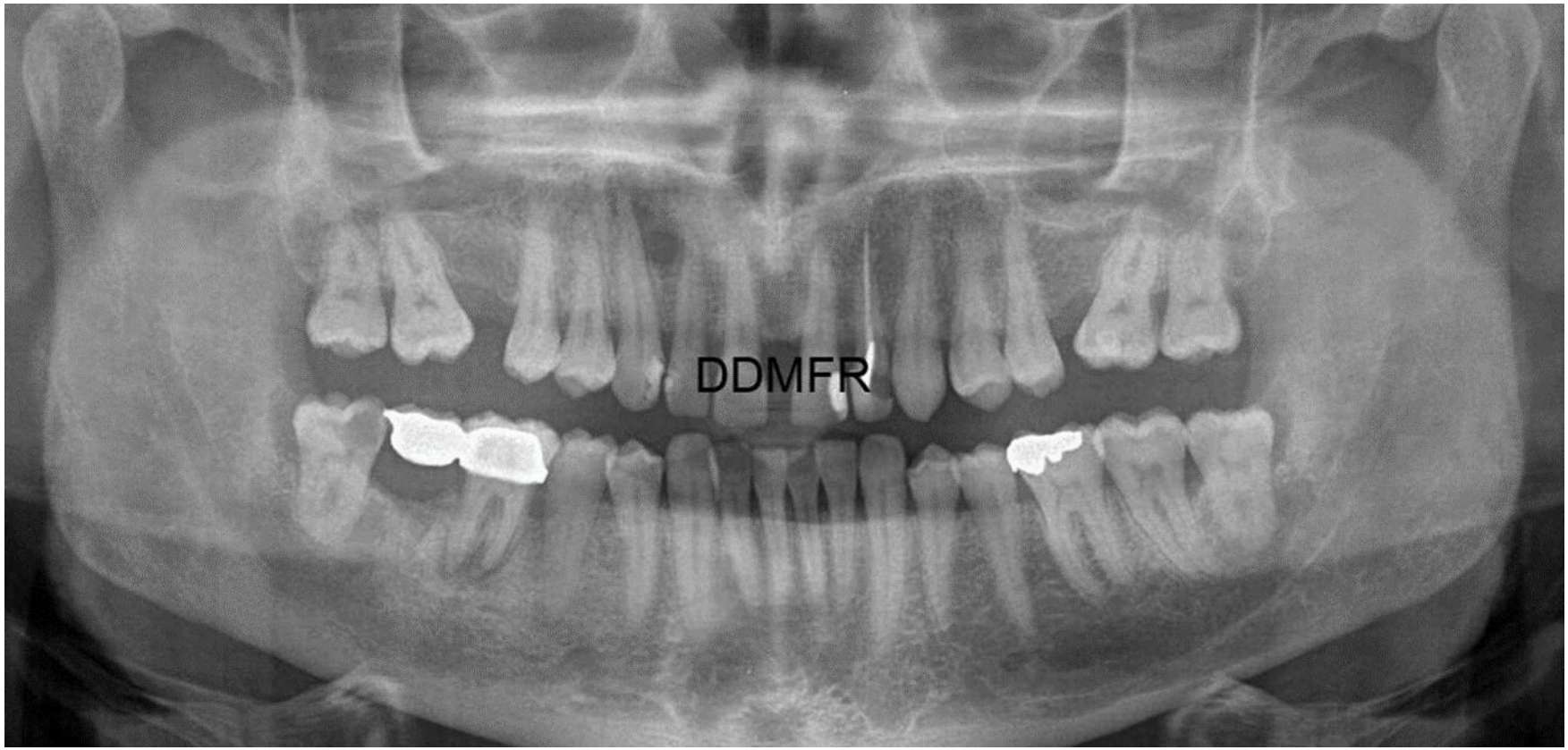
Osteomyelitis

- Infection spreads in bone marrow
- Lesion is no longer contained

Example

Periodontal lesions & Pericoronitis

- Lesion extended into overlying soft tissues
- Arises in the tissues surrounding the crown of the PE tooth


DDMFR

- The four cardinal signs of inflammation—redness, swelling, heat, and pain—may be observed in varying degrees with inflammation of the jaws

- Acute lesions are lesions of recent onset. The onset typically is rapid, and these lesions cause pronounced pain, often accompanied by fever and swelling.

- Chronic lesions have a prolonged course with a longer insidious onset and pain that is less intense
- Fever may be intermittent and low grade, and swelling may occur gradually
- Some chronic, low-grade infections may not produce any significant clinical symptoms

Radiographic features

- Location
- Periphery
- Internal structure
- Effects on surrounding structures

Periapical inflammatory lesions

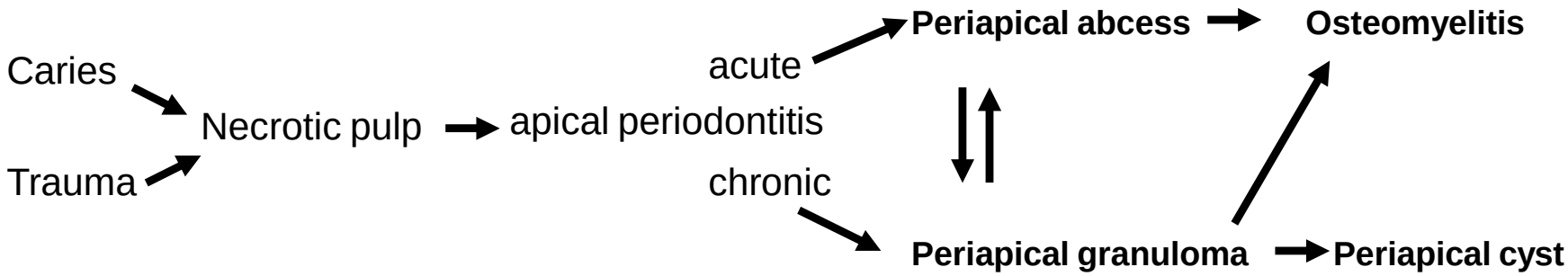
- Acute apical periodontitis
- Chronic apical periodontitis
- Periapical abscess
- Periapical granuloma

Periapical inflammatory lesions

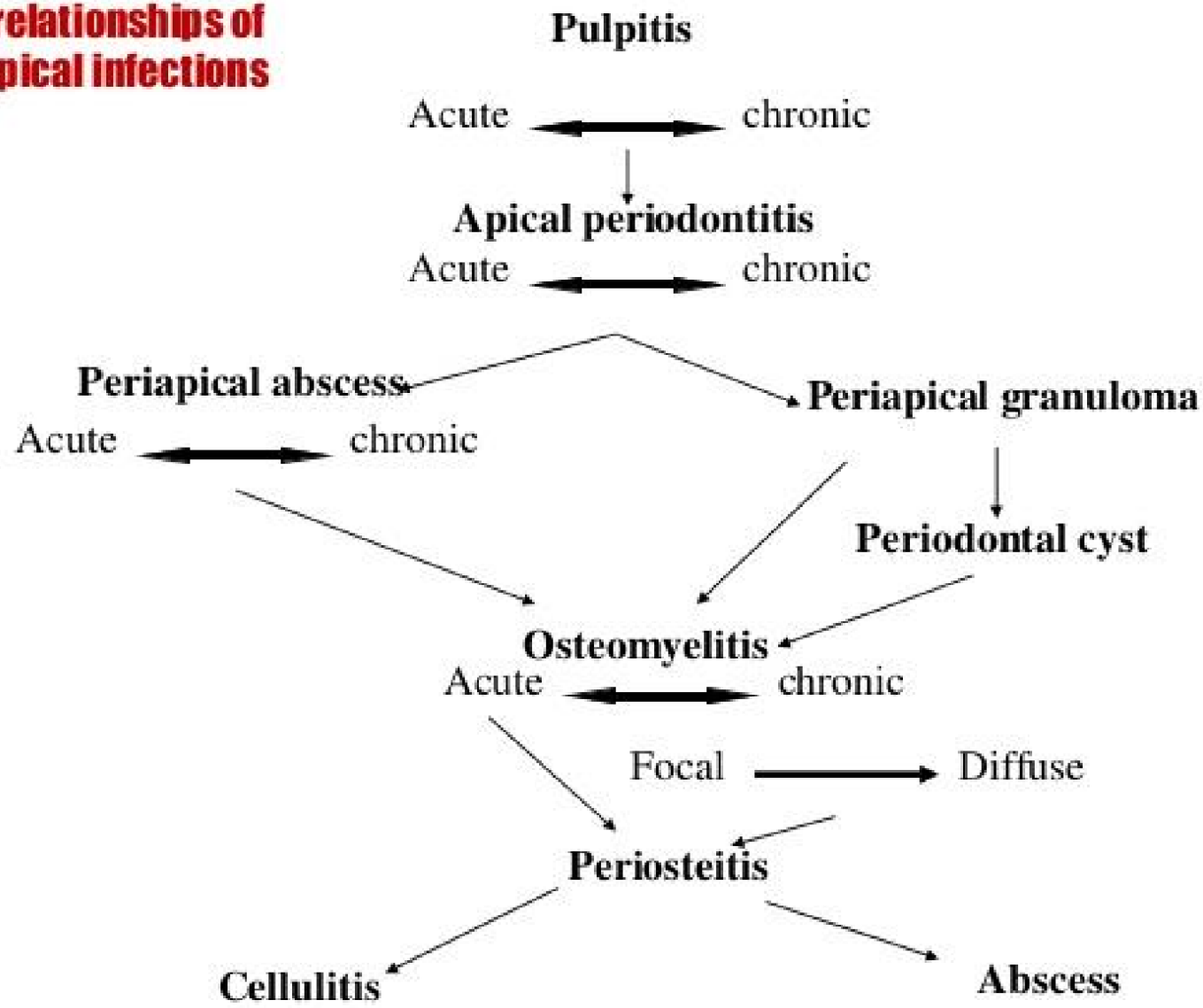
Rarefying oseitis/sclerosing osteitis

Periapical inflammatory lesions

- Def: local response of bone around apex of tooth that occurs 2° to necrosis of pulp or destruction of PA tissues by extensive periodontal disease



Interrelationships of periapical infections



Clinical features

- Asymptomatic …….severe pain w, w/o

  facial swelling, fever, lymphadenopathy

Radiographic features

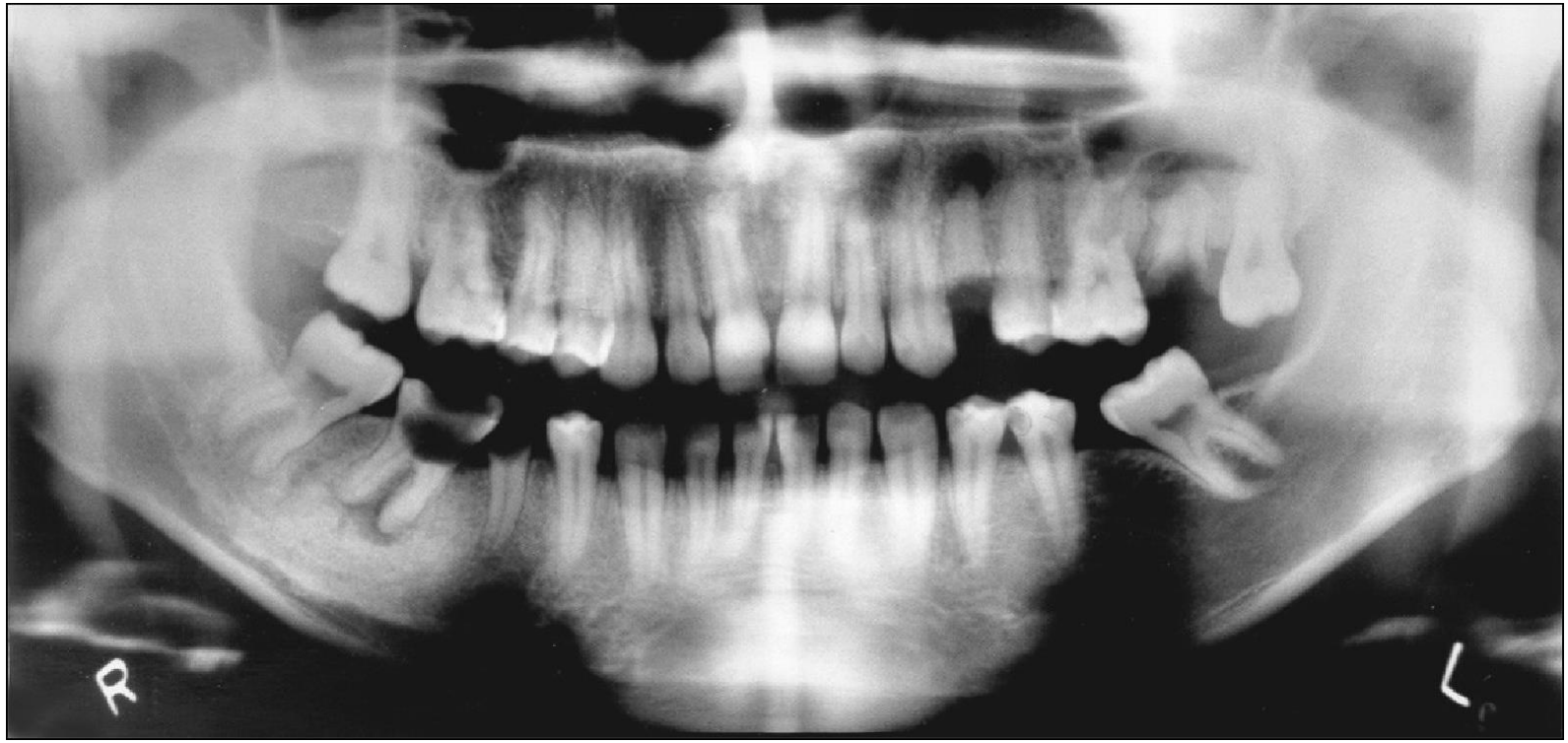
- Location
  - Apex of involved tooth
  - Cervically up the tooth root

Radiographic features

- Periphery
  - Ill defined
  - Well defined

Radiographic features

- Internal structure
  - Early …..no changes
  - Loss of bone density (widening of PDL at apex)
  - Larger diameter involvement
  - Mixture of sclerosis and rarefaction


R
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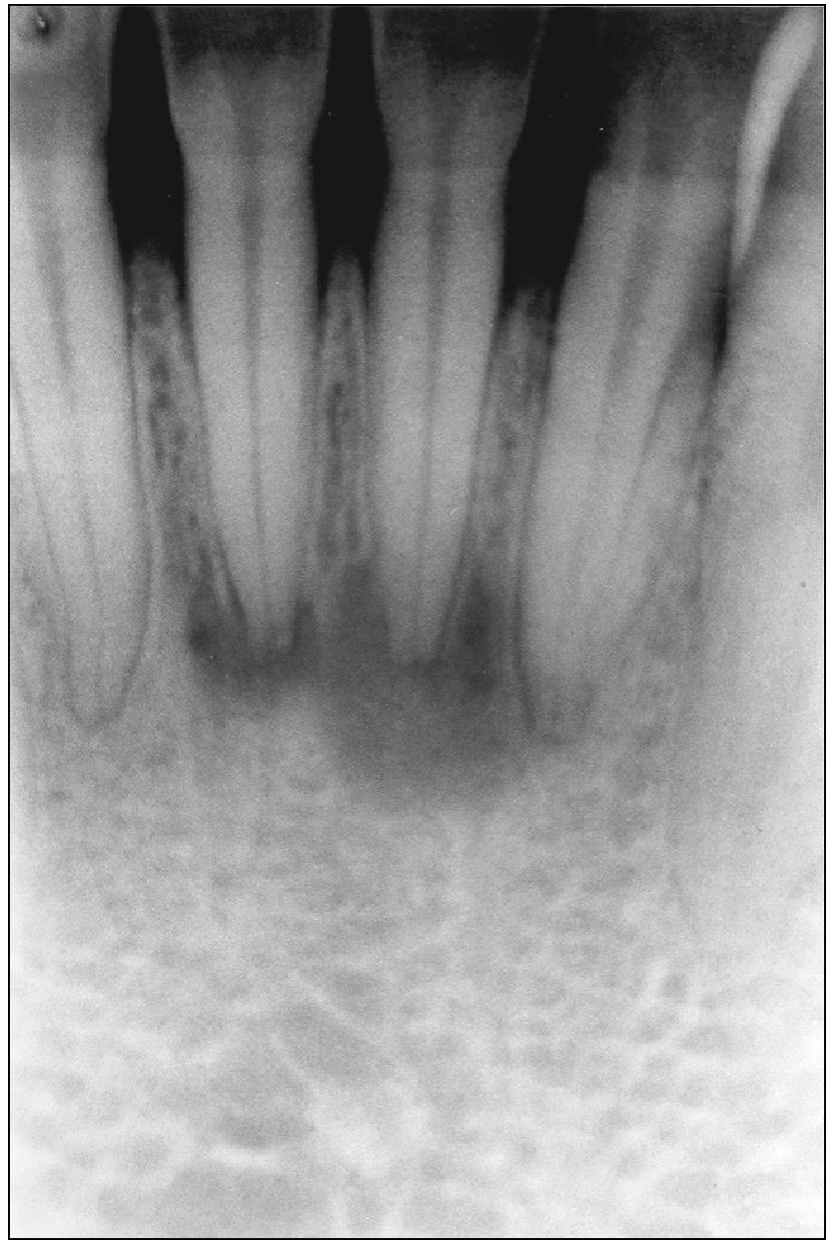
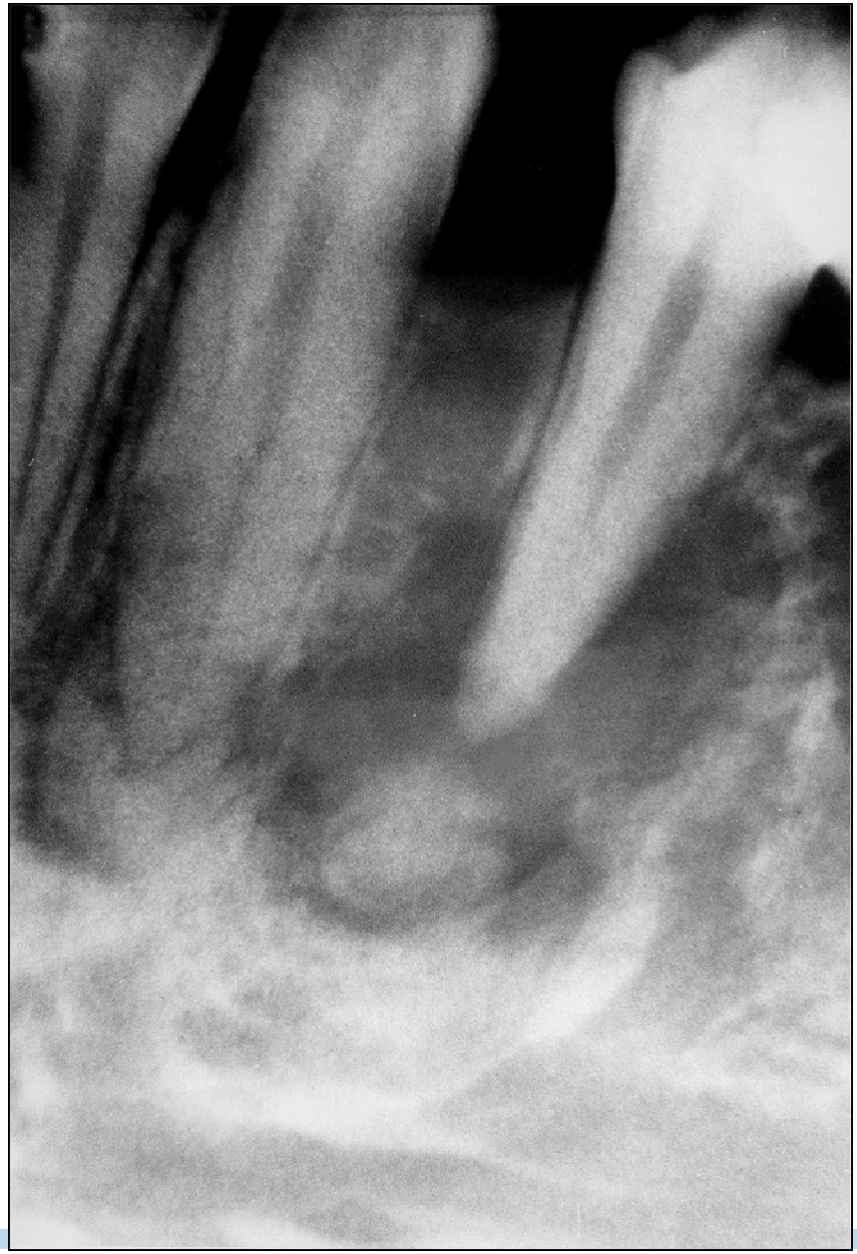
Differential diagnosis

- Periapical cemental dysplasia
- Enostosis, osteosclerosis



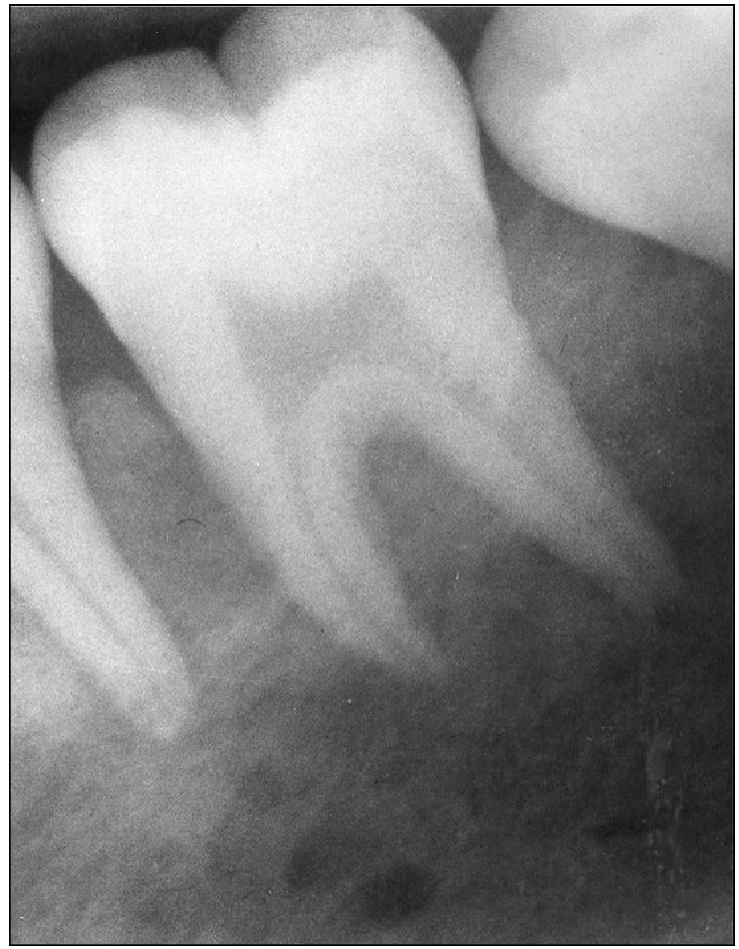


- Small, radiolucent periapical lesions with well defined periphery…….

granuloma or cyst

Differential diagnosis

- Surgical scar
- Mets & leukemia



CLINICAL FEATURES:

- Thermal changes does not induce pain.
- Slight extrusion of tooth from socket.
- Cause tenderness on mastication due to inflammatory edema collected in PDL.
- Due to external pressure, forcing of edema fluid against already sensitized nerve endings results in severe pain.

APICAL PERIODONTITIS

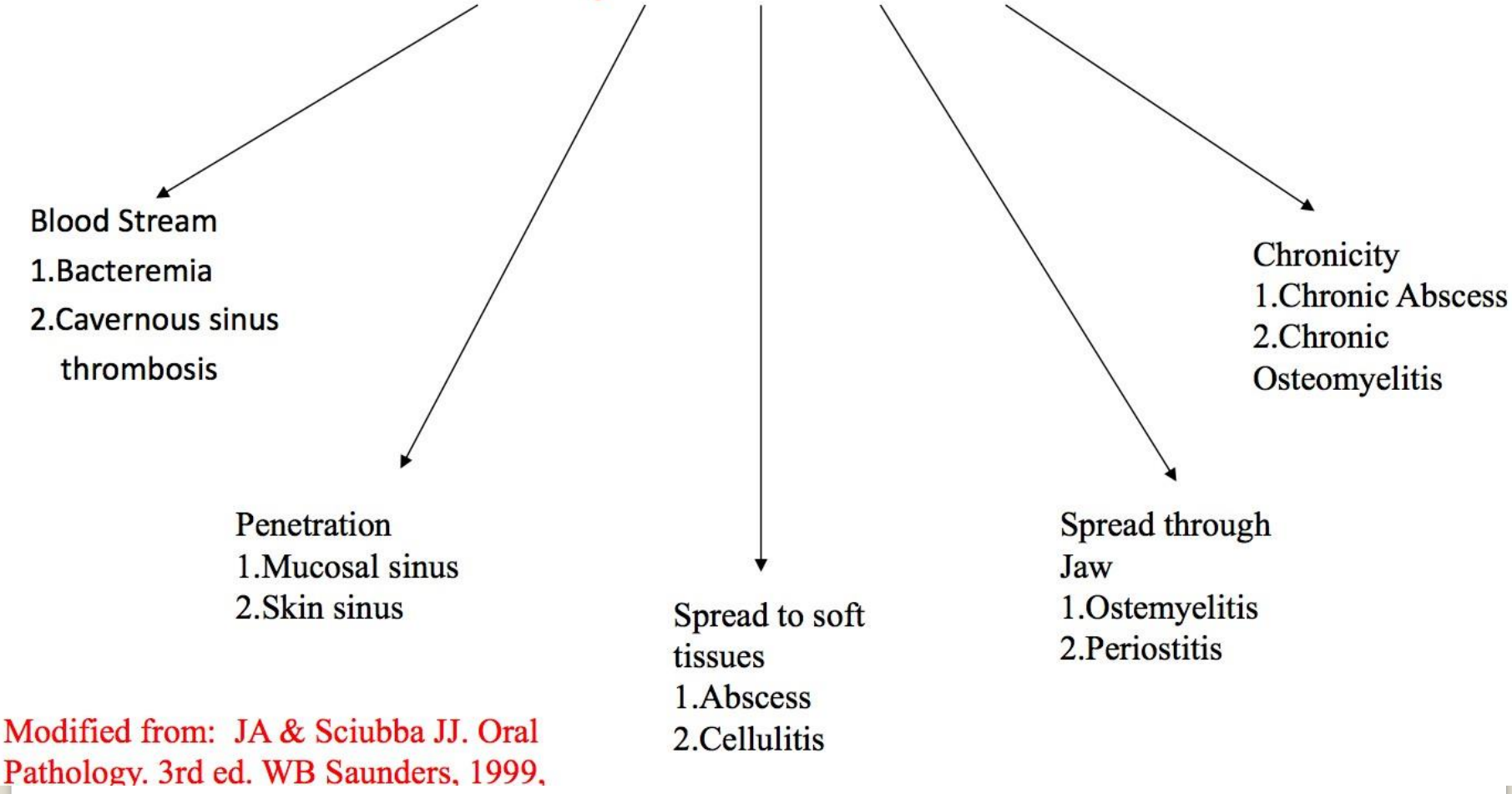
R/F

Periapical	Gingival	Periodontal	Pericoronal
			
It forms at the root tip.	It forms in the space between the gum and tooth.	It forms in a periodontal pocket.	It forms around impacted or partially erupted tooth.

Sharedentalcare.com

ABSCESS

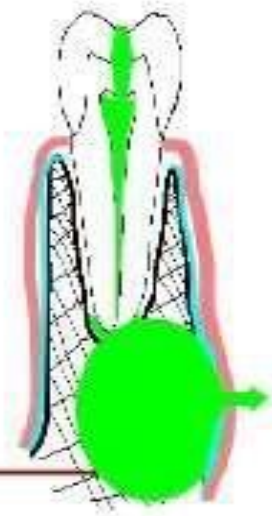
Periapical Abscess



Modified from: JA & Sciubba JJ. Oral Pathology. 3rd ed. WB Saunders, 1999.

CLINICAL FEATURES:

- Common findings of inflammation- heat, redness, swelling and pain.
- Tenderness of tooth, which relives after pressure application.
- Extreme painful tooth extrude from socket.
- Systemic manifestations like lymphadenitis & fever may present when confined to periapical region.
- Rapid extension to adjacent bone marrow spaces produces acute osteomyelitis or dentoalveolar abscess.

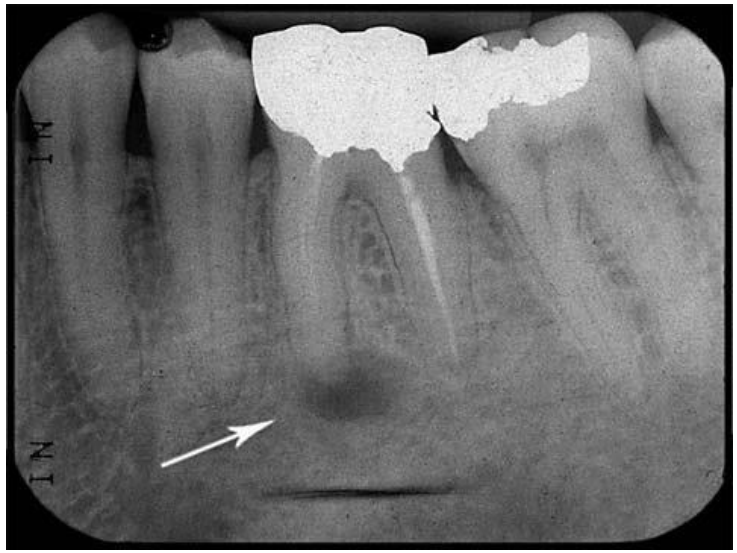


PERIAPICAL ABSCESS

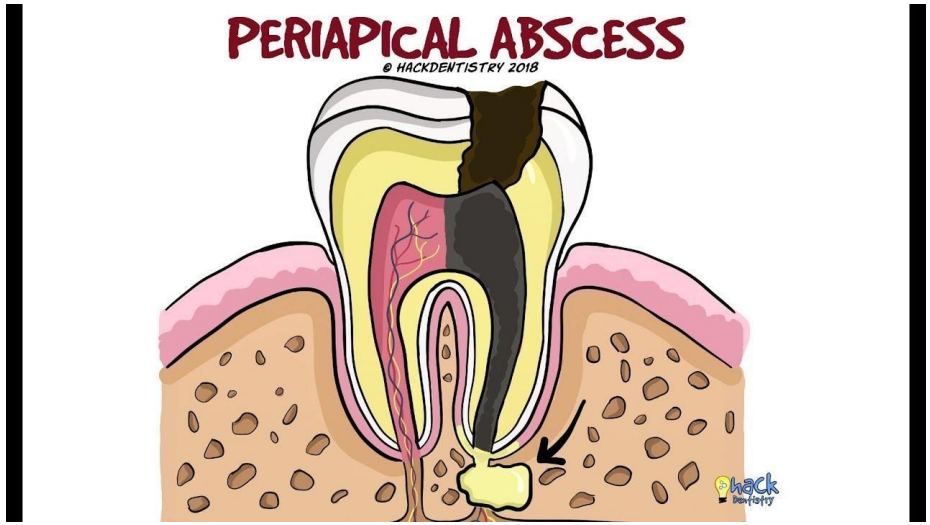
Intraoral labial sinus opening in relation to the carious maxillary lateral incisor

Intraoral palatal sinus opening in relation to the carious maxillary central incisor

Extraoral sinus opening

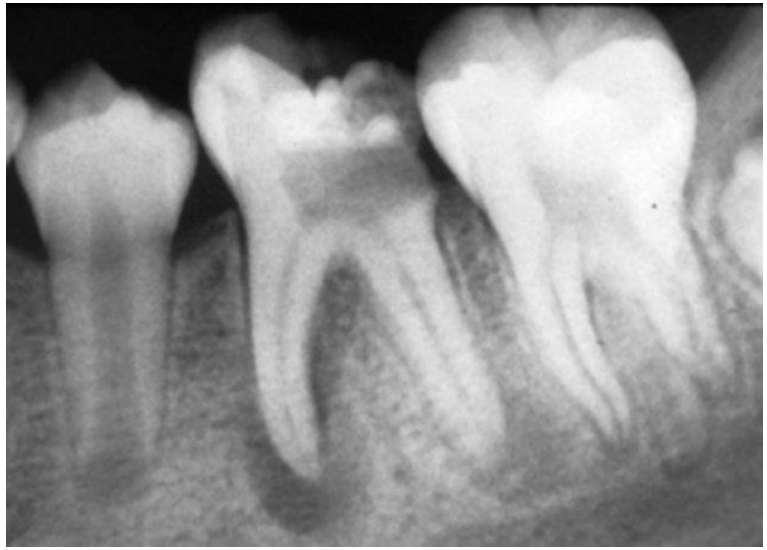


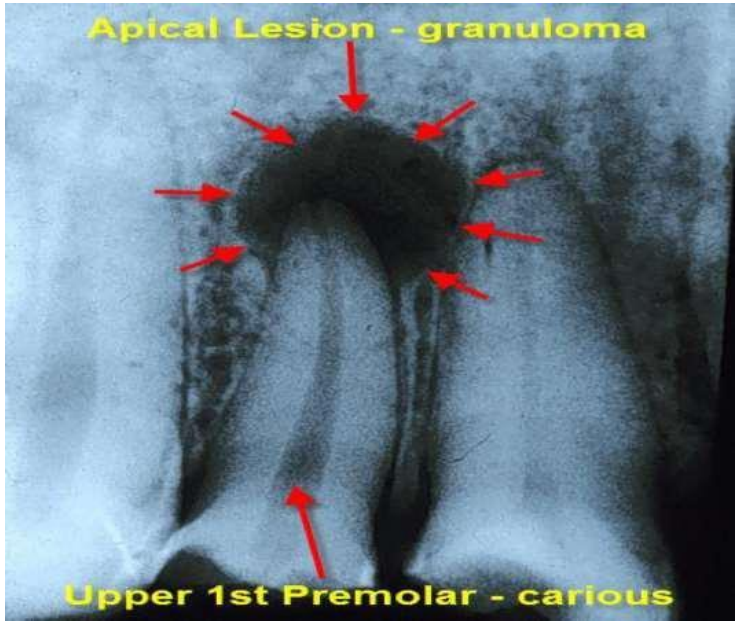

abscess


PERIAPICAL ABSCESS
© HACKDENTISTRY 2018

Periapical granuloma

- Most common periapical pathology
- Seen in 70-90% of cases,associated with non-vital tooth,Asymptomatic
- Well circumscribed radiolucency,surrounding apex of tooth,thin radiopaque border
- Radiographic size-upto 1-1.5cm in diameter
- Most commonly involves teeth with deep restorations and extensive caries




Apical Lesion - granuloma
Upper 1st Premolar - carious

Differential diagnosis

1.***Radicular cysts***-Larger in size,swelling or expansion of cortical plates seen

2.***Chronic Alveolar abscess***-Associated with pain,ill defined borders may be seen,hazy radiolucency

- 2nd most commonly seen pulpoperiapical lesion
- Most common among all odontogenic cysts reported,Seen in 15-25% of cases
- 60% of cases involves Max.lateral incisor apex
- Associated with non vital tooth
- Swelling may be seen,on palpation-bony hard & demonstrates crackling sound in areas where cortical plates are thinned

Radicular cyst

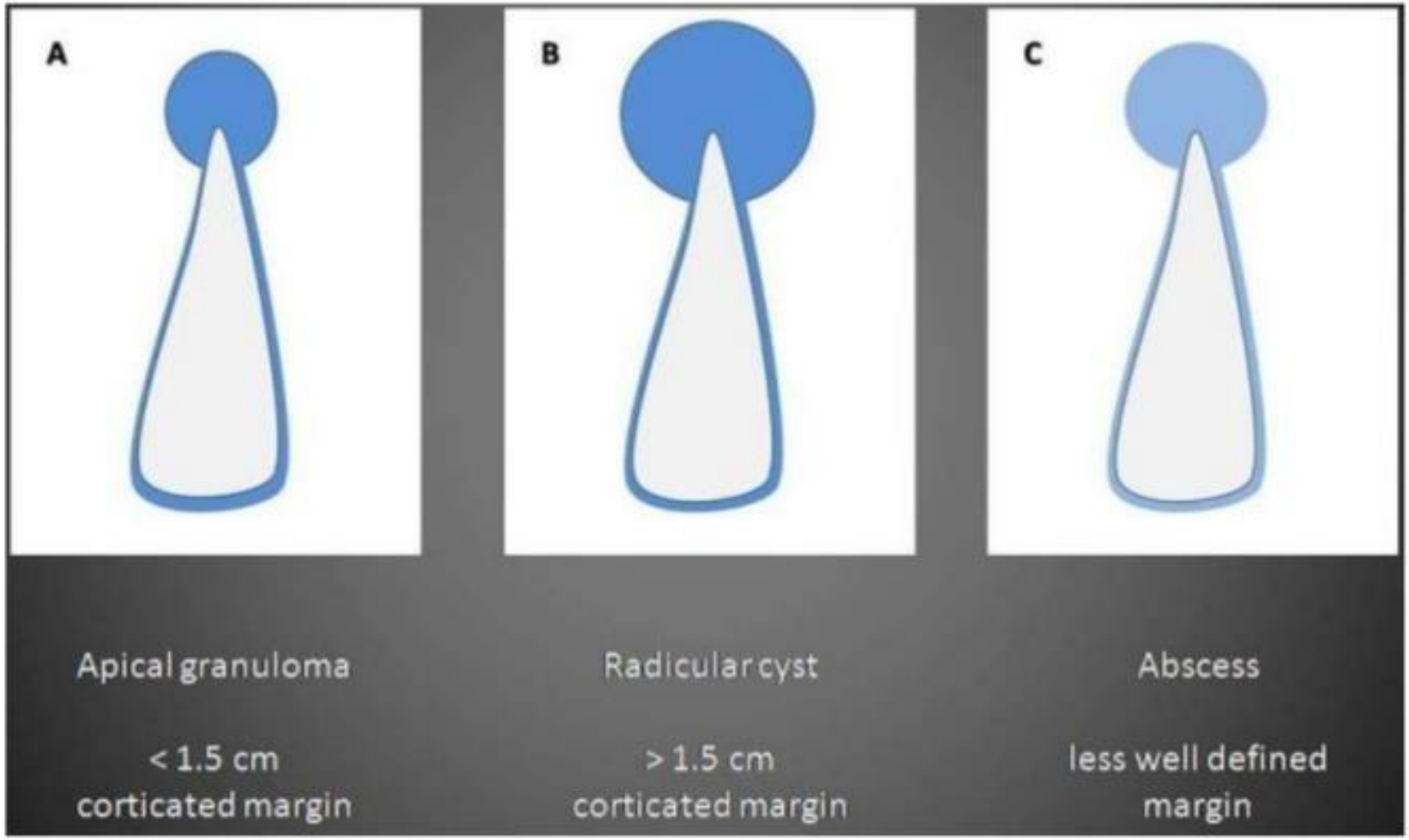
- If cyst becomes infected,swelling & painful symptoms of abscess is seen
- Aspiration of non infected cyst produces light straw colored fluid-containing abundance of shiny cholesterol crystals
- Radiographically-well defined radiolucency > 1-2 cm in diameter,apex of the affected tooth
- 20% of cases-root resorption,Expansion of cortical plates-chronic cases


A

- *Differential diagnosis*
  - *Periapical granuloma*-**cyst has a larger R.L**
  - *Periapical abscess*- **ill defined hazy R.L**
  - *Periapical scar*-**seen in teeth that have received successful non surgical endodontic treatment**
  - *Surgical defect*-**Asymptomatic R.L.,seen after root resection**
  - *Periapical cementoosseous Dysplasia*-**associated with vital tooth,involves mand.anteriors**

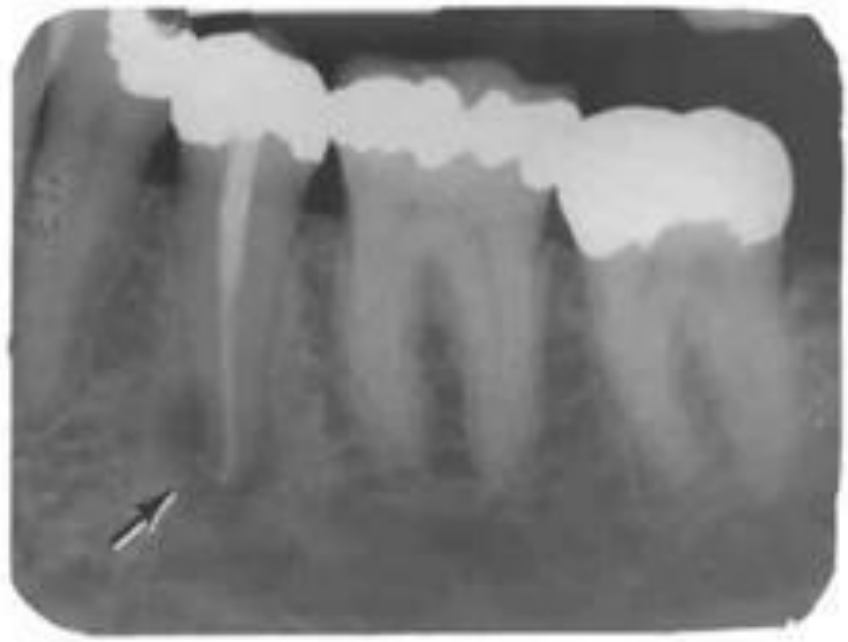
- ***Traumatic bone cyst***-associated with vital tooth,90% of cases seen in mand premolar-molar area,intact lamina dura
- ***Periodontal diseases***-Moderate to severe crestal bone loss
- ***Systemic disorders***-hyperparathyroidism,Multiple myeloma,Malignant tumors

Periapical lucency



Periapical scar

- Composed - dense fibrous tissue, Apex of non vital tooth, in teeth - undergone successful R.C.T.
- Previous Periapical granuloma or cyst or abscess where healing has terminated leading to formation - scar tissue
- 2-5% of Periapical Radiolucencies
- Radiographically-Well circumscribed R.L, Round, resembling Periapical cyst / granuloma, but smaller in size
- Associated R.L remains constant in size or shrinks slightly
- Occurs most commonly in Ant.region of maxilla



Dentoalveolar Abscess

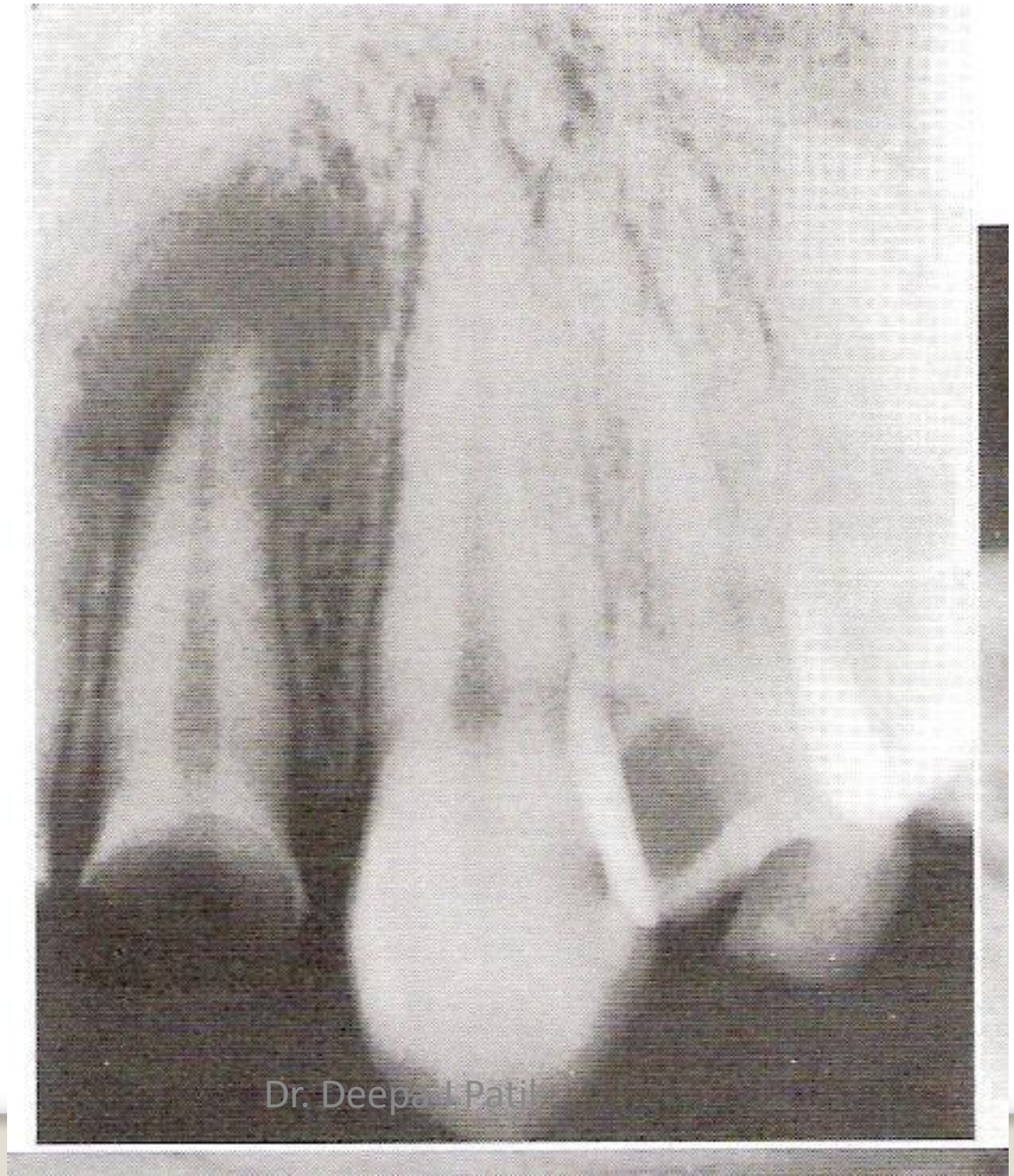
- 2% of all pathological periapical R.L.
- Acute alveolar abscess-No radiographic findings
- Chronic-ill defined or occassionally well defined R.L

  ,Irregular,sometimes with a hyperostotic border,root

  resorption maybe present
- Seen as blurred region of lessened density
- Affected tooth usually shows deep restorations,non vital,extensive caries

Differentialdiagnosis

- ***Periodontal abscess***-Originates from deep periodontal pocket,vital tooth,presence of R.L. in interdental area
- ***Secondarily infected tumors/cysts***
- ***Non Odontogenic cysts***-associated with vital pulps

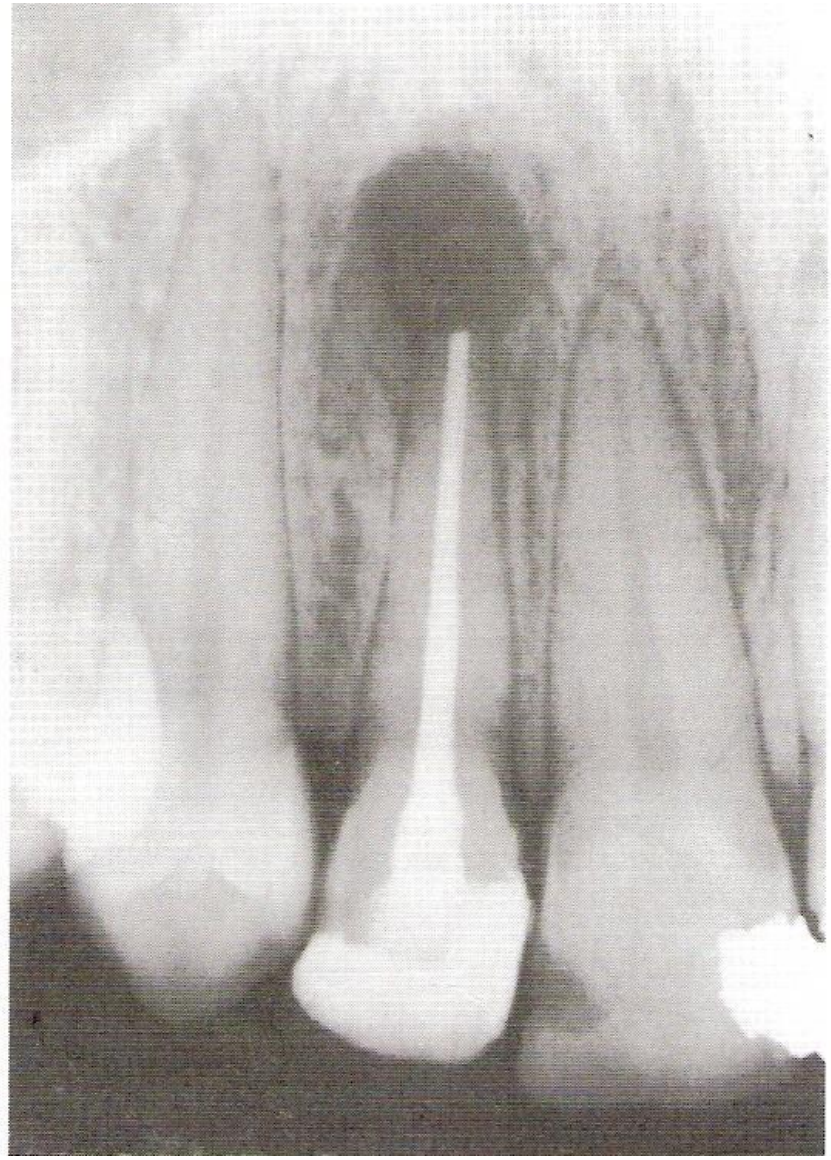


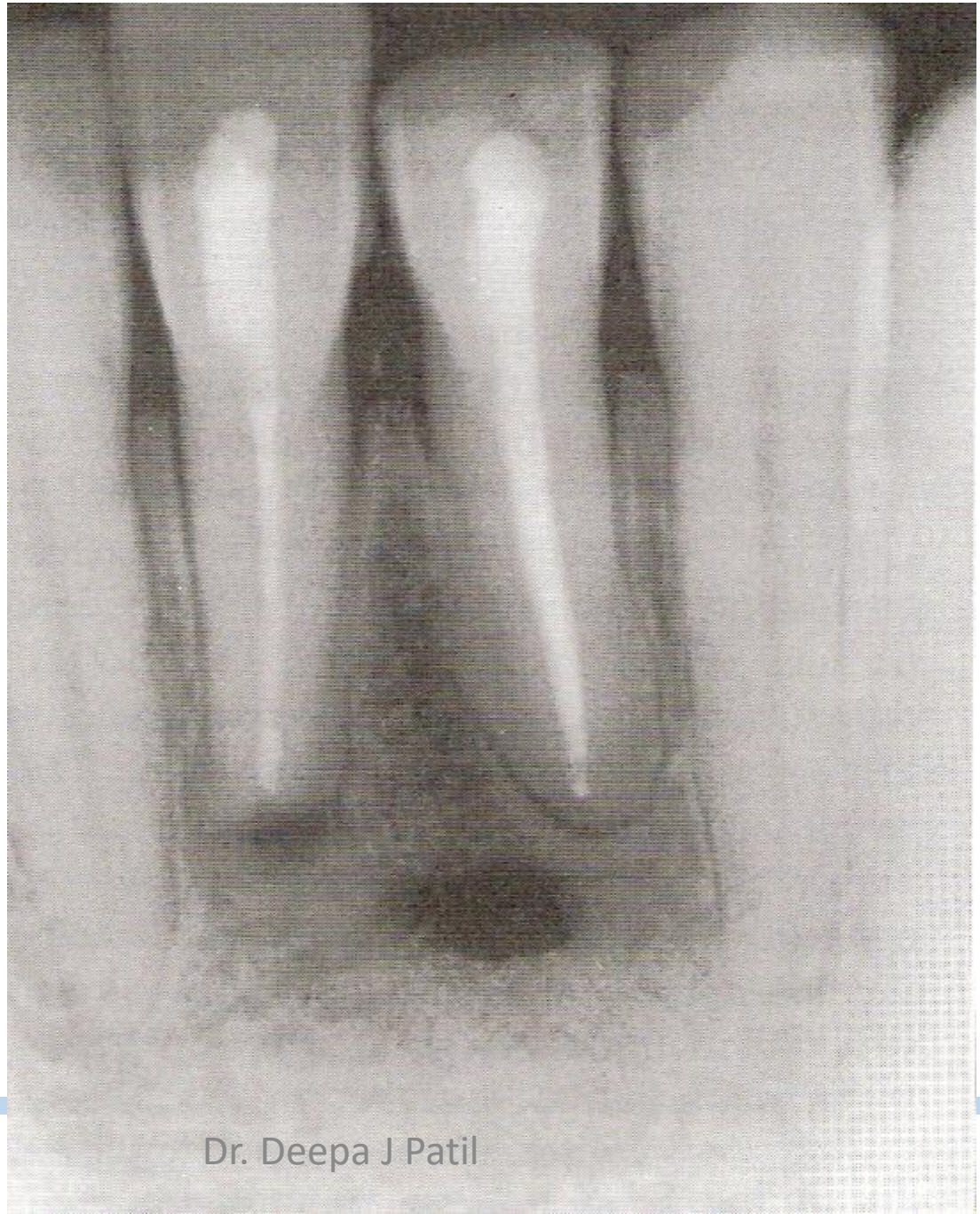
Surgical defects

- 2-3% of all periapical R.L
- An area that fails to fill with osseous tissue after surgery
- Commonly seen in root resection procedures where
  both labial and lingual plates have been destroyed
- Radiographically-rounded R.L, smoothly contoured,well defined borders,Approx 1 cm in size
- R.L usually decreases in size over period of time &
  resolves to a certain size and then remains constant
- Associated tooth is non vital
- If defect is large, can be palpated

Differential diagnosis

- ***Pulpoperiapical lesions***-Surgical defect-H/o root resection, Asymptomatic, endodontically treated tooth,well defined R.L not >1cm
- Small depression in mucosa over periapical area
- If R.L. shadow caused by surgical defect-shows reduction in size over period of time





Pericoronitis

- Inflammation of the tissues surrounding the crown of a partially erupted tooth

Radiographic features

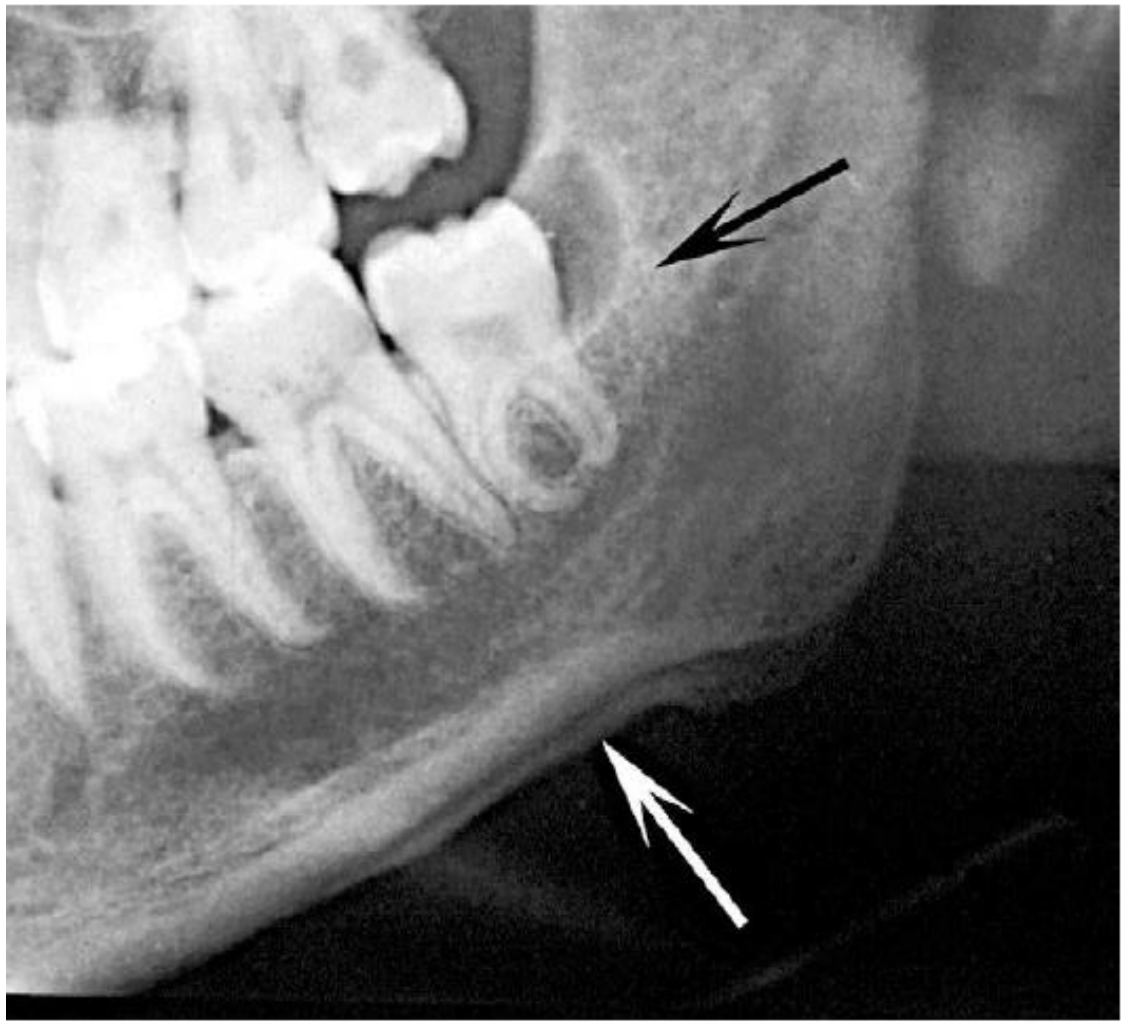
No changes……

localized rarefaction and sclerosis……..

osteomyelitis

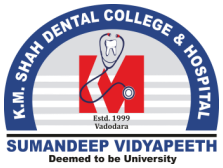
Radiographic features

- Enlargement of follicular space with ill defined periphery and gradual transition of the normal trabecular pattern
- Surrounding bone rarefaction or sclerosis
- Periosteal new bone formation



Differential diagnosis

- Enostosis
- FD
- Oseosarcoma
- SCC



SUMANDEEP VIDYAPEETH
K M SHAH DENTAL COLLEGE AND HOSPITAL

Authors	A Petersson , S Axelsson, T Davidson, F Frisk, M Hakeberg, T Kvist, et al
Title	**Radiological diagnosis of periapical bone tissue lesions in endodontics: a systematic review** Int Endod J 2012 Sep;45(9):783-801 Level 1a
Aim	This systematic review evaluates the diagnostic accuracy of radiographic methods employed to indicate presence/absence and changes over time of periapical bone lesions. Also investigated were the leads radiographic images may give about the nature of the process and the condition of the pulp in non-endodontically treated teeth
Methodology	Electronic literature search included the databases PubMed, Embase and CENTRAL from January 1950 to June 2011. All languages were accepted provided there was an abstract in English. The MeSH terms were 'Cone beam computed tomography (CBCT)', 'Radiography, panoramic', 'Periapical diseases', 'Dental pulp diseases', 'Sensitivity and specificity', 'receiver operating characteristics (ROC) curve', 'Cadaver', 'Endodontics' and 'Radiography dental'..
Results & Conclusion	There is insufficient evidence that the digital intraoral radiographic technique is diagnostically as accurate as the conventional film technique. The same applies to CBCT. No conclusions can be drawn regarding the accuracy of radiological examination in identifying various forms of periapical bone tissue changes or about the pulpal condition.

CCES

1. All are signs of inflammation EXCEPT one. Which one is the EXCEPTION?

- **a. Pain.**
- **b. Nausea.**
- **c. Redness.**
- **d. Swelling.**

2. Which is NOT a sign of a chronic lesion?

- a. Swelling.
- b. Severe pain.
- c. Gradual onset.
- d. Low-grade fever

3.All are characteristics of periapical lesions EXCEPT one. Which one is the EXCEPTION?

- a. Appear radiopaque or radiolucent.
- b. Mostly well-defined periphery.
- c. Lesions are located at the apex of the tooth.
- d. Widening of the periodontal ligament (PDL) space

4. Which finding BEST differentiates periapical cemental dysplasia (PCD) from periapical inflammatory lesions?

- a. Vitality of teeth.
- b. Location of lesions.
- c. Radiographic imaging.
- d. Presence of external root resorption.

5.Radiographic signs of pericoronitis include all EXCEPT one. Which one is the EXCEPTION?

- a. Adjacent bone has fine trabecular plates with multiple small trabecular spaces.
- b. Ill-defined periphery.
- c. Transition from normal to sclerotic bone pattern in severe cases of inflammation.
- d. Radiolucent due to localized rarefaction

Osteomyelitis

- Inflammation of bone (marrow, cortex, cancellous portion & periosteum)

- Source: pyogenic

  hematogenous

Osteomyelitis

Hallmark is **sequestra**

It is a segment of bone that has become necrotic because of ischemic injury caused by inflammation

CONTENTS

- Definitions
- Classifications
- Etiology & Pathogenesis
- Clinical features
- Differential Diagnosis
- Investigations
- Histological features
- Treatment
- Prognosis

DEFINITION:

Osteomyelitis is an extensive inflammation of the medullary portion of the bone
-Topazin 2002

It is an extensive inflammation of the bone. It also involves cancellous bone marrow, cortex and periosteum.

- *Peterson, Oral and Maxillofacial Surgery 4th Edition*

BACKGROUND

- 400 BC-Hippocrates was first person to describe OML of spine.
- 1736,William Hey,described the OML of tibia.
- 1787,Samuel Copper described chronic OML,in tibia
- 1873,Augustec Nelation was the first person to describe chronic OML in mandible

- 1955, Pell described a case in mandible & was first to describe the microbiological etiology associated with it.

CLASSIFICATIONS

Based on course of the disease:

- ✓ Acute
- ✓ Sub acute
- ✓ Chronic

Based on suppuration

Suppurative

- Acute
- Chronic (primary or secondary)
- Infantile

Non suppurative

- Chronic sclerosing (focal/diffuse)
- Garre's sclerosing
- Actinomycotic
- Radiation

CLASSIFICATION

- *Restricted to osteomyelitis of jaws.*

- Acute forms of OML (Suppurative or Non-suppurative forms):
  - *Contiguous focus*: Trauma, Surgery and Odontogenic infections.
  - *Progressive:* burns, sinusitis and Vascular insufficiency.
  - *Hematogenous* (Metastatic): Developing skeleton (children).

B. Chronic form of OML

- *Recurrent multifocal*: Developing skeleton (children)
- *Garre's:* Unique proliferative subperiosteal reaction, Developing skeleton (children to young adults).
- *Suppurative or Non-suppurative*: Inadequately treated forms, Systemically compromised forms, and Refractory forms.
- *Diffuse sclerosing: Fastidious* organisms, and compromised host /pathogen interface.

Suppurative osteomyelitis

- Acute suppurative osteomyelitis.
- Chronic suppurative osteomyelitis.
- Primary osteomyelitis (no acute phase preceding).
- Secondary osteomyelitis (follows acute phase).
- Infantile osteomyelitis.

Non suppurative osteomyelitis

- Chronic sclerosing osteomyelitis.
- Focal sclerosing osteomyelitis
- Diffuse sclerosing osteomyelitis.
- Garre’s sclerosing osteomyelitis
- Osteoradionecrosis

Osteomyelitis accompanying systemic disease

- Tuberculosis.
- Actinomycosis.
- Syphilis.
- Osteonecrosis of jaws may accompany Noma
- Chemical, electro-coagulation and irradiation may also be causative.

Indian J Tuberc 2005; 52:147-150

PREDISPOSING FACTORS

- Conditions that alter the resistance of the host.
- Virulence of microorganisms.
- Conditions that are associated with decreased vascularity of the bone

FACTORS

- Tobacco, alcohol abuse
- Intravenous drug abuse
- Diabetes mellitus
- Anemia
- Malnutrition
- Malignancy
- AIDS
- Bone diseases

OOO,2001,92:392-8

Aerobic & anaerobic organisms (mixed)

Aerobic:

Streptococcus (α-hemolytic streptococcus viridians): mainly

Staphylococcus aureus and staphylococcus albus: due to added infection via wounds & fistulae

Anaerobic organisms

- *Anaerobic streptococcus.*
- *Bacteriodes.*
- *Fusobacterium.*
- *Peptostreptocuccus.*
- *Peptococcus.*
- *Eubacterium.*
- *Actinomyces.*

Other associated bacteria:

- Klebsiella
- Pseudomonas
- Mycobacterium
- Treponema palladium
- MRSA

Topazian R G ; Text book of Oral and Maxillofacial Infections, 2002.

ETIOLOGY

- Contiguous focus of infection (local odontogenic or non -odontogenic).
- Hematogenous (spread) dissemination.
- Osteomyelitis associated with intrinsic bony pathology or peripheral vascular diseases.

Australian Dental Journal 2005;50:(3):200-203

CONTIGUOUS FOCUS OF INFECTION

Odontogenic infections

- Periapical
- Periodontal
- Pericoronal
- Infected cyst/tumor
- Infected extraction wound/fracture site

Specific infection

- Tb
- Syphilis
- Actinomycosis

Other causes

- Local traumatic injuries
- Infected odontomes
- Hematogenous infections

PATHOGENESIS

Persistent source of infection
destruction of the protective barrier

⬇

Organism is introduced deep into underlying tissues

⬇

Acute immflamation

Intense neutrophilic infiltration, hyperemia, increased capillary permeability and infiltration of granulocytes.

⬇

Necrosis of involved bone and tissue

Pus accumulates, intermedullary pressure increases, resulting in vascular collapse, venous stasis and ischemia.

↓

Pus travels through the haversian and nutrient canals

↓

Subperiosteal abscess

↓

Ischemic necrosis of bone

↓

Compression of neurovascular bundle

↓

Mucosal and cutaneous abscess and fistula may develop .

CHRONIC

OSTEOMYELITIS

Inflammation regresses, granulation tissue is formed, new blood vessels

↓

lysis of bone, thus separating fragments of residual necrotic bone termed sequestra from viable bone

↓

Involucrum

↓

Cloacae

Acute Osteomyelitis

- Predominantly neutrophils
- From non vital teeth most commonly

Radiographic features

- Very early ……no change
- Ill defined periphery
- Decrease in density
- Loss of sharpness of trabeculae

CHRONIC OSTEOMYELITIS

It is persistent disease of bone, characterized by the immflammatory process, including necrosis of mineral &the marrow tissue,suppuration,resorption,sclerosis and hyperplasia.

Causes of chronic osteomyelitis:

- Mainly by odontogenic microorganisms.
- Complication of dental extractions & surgery, maxillofacial trauma
- Inadequate treatment of a fracture, and/or irradiation to the mandible.
- Inadequate antibiotic treatment

CLINICAL FEATURES

- Localized tenderness & pain
- Swelling
- Non healing soft tissue wounds with induration
- Low grade fever
- Lymphadenopathy
- Intraoral & extra oral sinuses with purulent discharge.
- Pathological fractures.

PRIMARY CHRONIC OSTEOMYELITIS

- Occurs due to long standing virulent microorganism
- Insidious in onset.
- Slight pain.
- Often without fistulae.

SECONDARY CHRONIC OM

- Fistulas.
- Induration of soft tissue.
- Wooden or thickened character of affected areas.
- Pains and tenderness to palpation.
- Pathologic fracture

Neelima Malik; Text book of Oral and Maxillofacial Surgery, 2002

CLINICAL DIFFERENTIAL DIAGNOSIS

- Actinomycotic OML.
- Tuberculous OML.
- Malignancy of jaws (Squamous cell carcinoma).
- Osteoradionecrosis.

INVESTIGATIONS

- Vitality tests
- Culture & sensitivity tests
- Cytosmear
- Blood investigations
- Bone marrow aspiration
- Imaging
- Bone biopsy

OTHER MODALITIES

- *Computed tomography.*
- *Magnetic resonance (MRI).*
- *Radio-nucleotide bone scanning*
- *Cone beam CT*
- *Scintigraphy*

Ref:OOO,2001;92:394-8

CONVENTIONAL RADIOGRAPHS

- Radiographic changes ---30-60% of mineralized bone is destroyed

Iopa's

Opg's

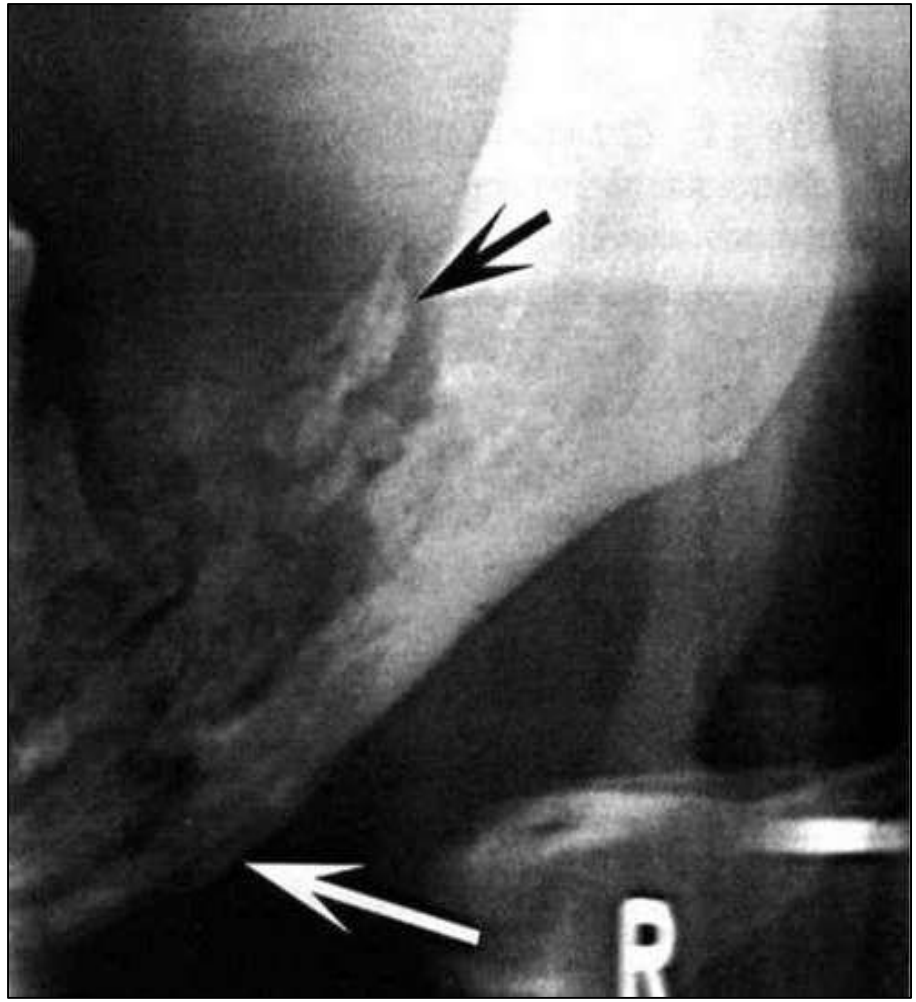
Occlusal

Lateral oblique

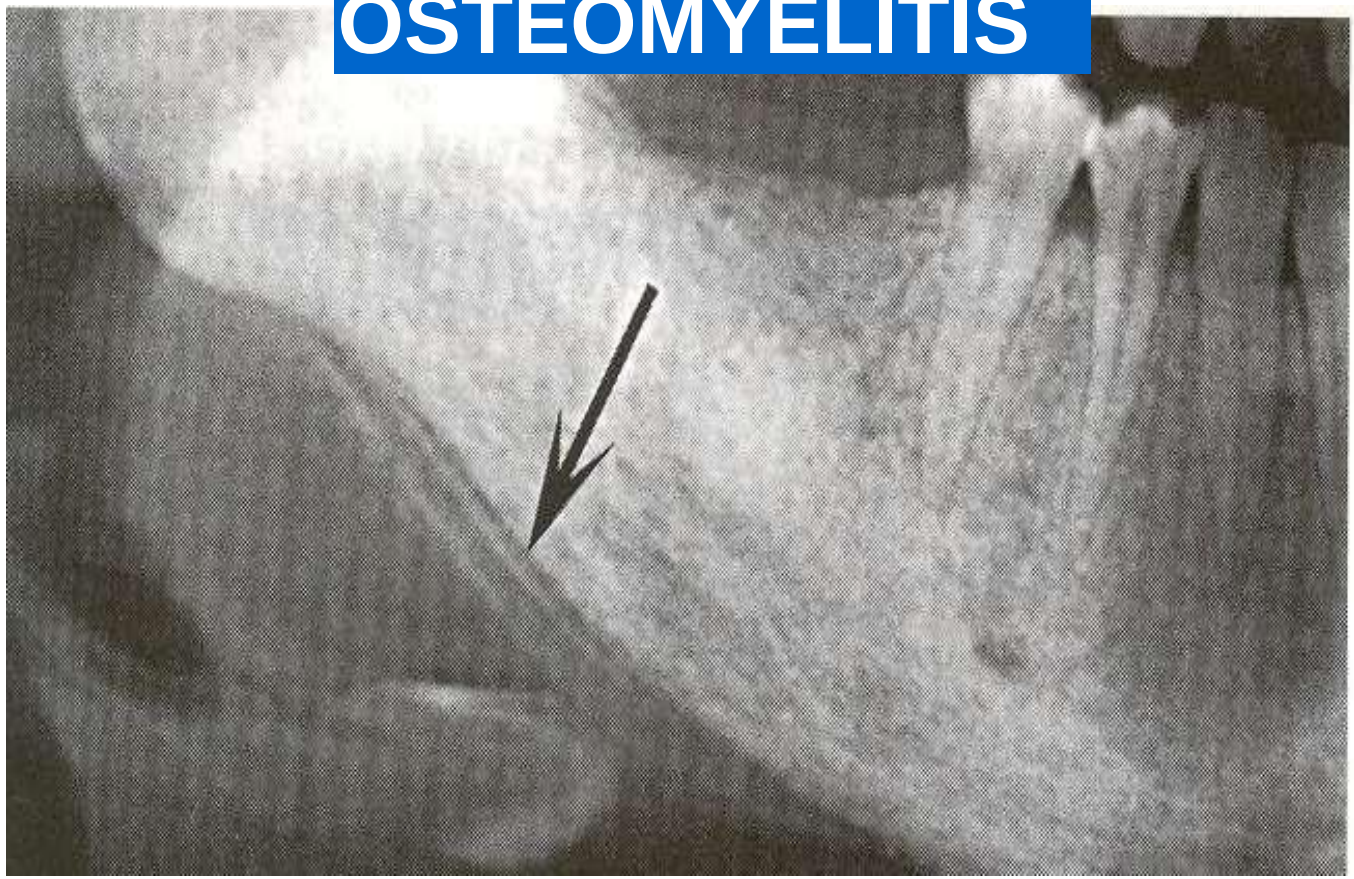
WORTH 'S DESCRIPTION

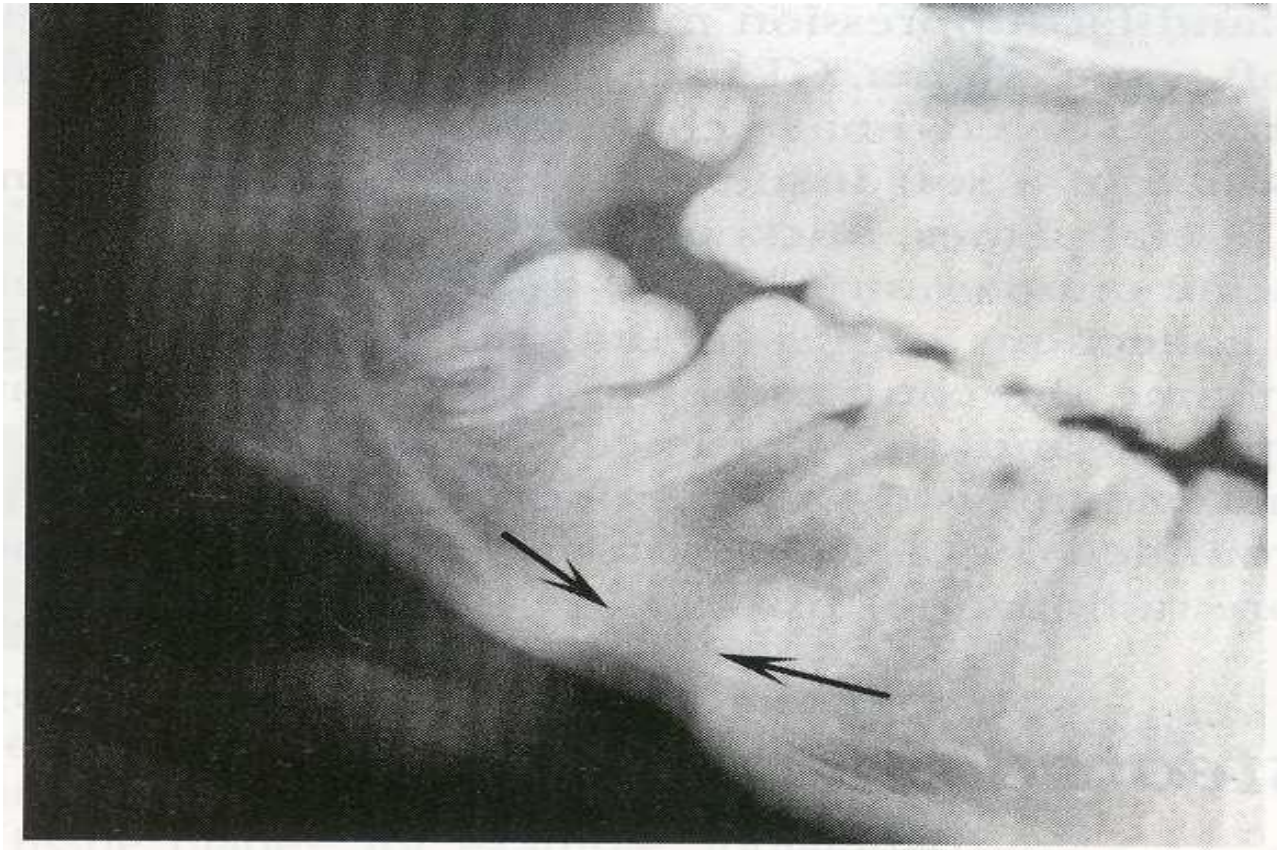
- Scattered areas of the bone destruction "***moth eaten***" appearance due to enlargement of medullary spaces & widening of Volkmann's canal.
- Bone destruction with islands i.e. sequestra, with a trabecular pattern. Sheath of new-bone (involucrum) is often found separated from the sequestra by zone of radiolucency.
- Subperiosteal deposition of bone giving stippled /granular appearance

MOTH EATEN APPEARANCE



CHRONIC OSTEOMYELITIS





COMPUTED TOMOGRAPHY

- High resolution CT picks up early bone changes before they are noted on conventional radiographs

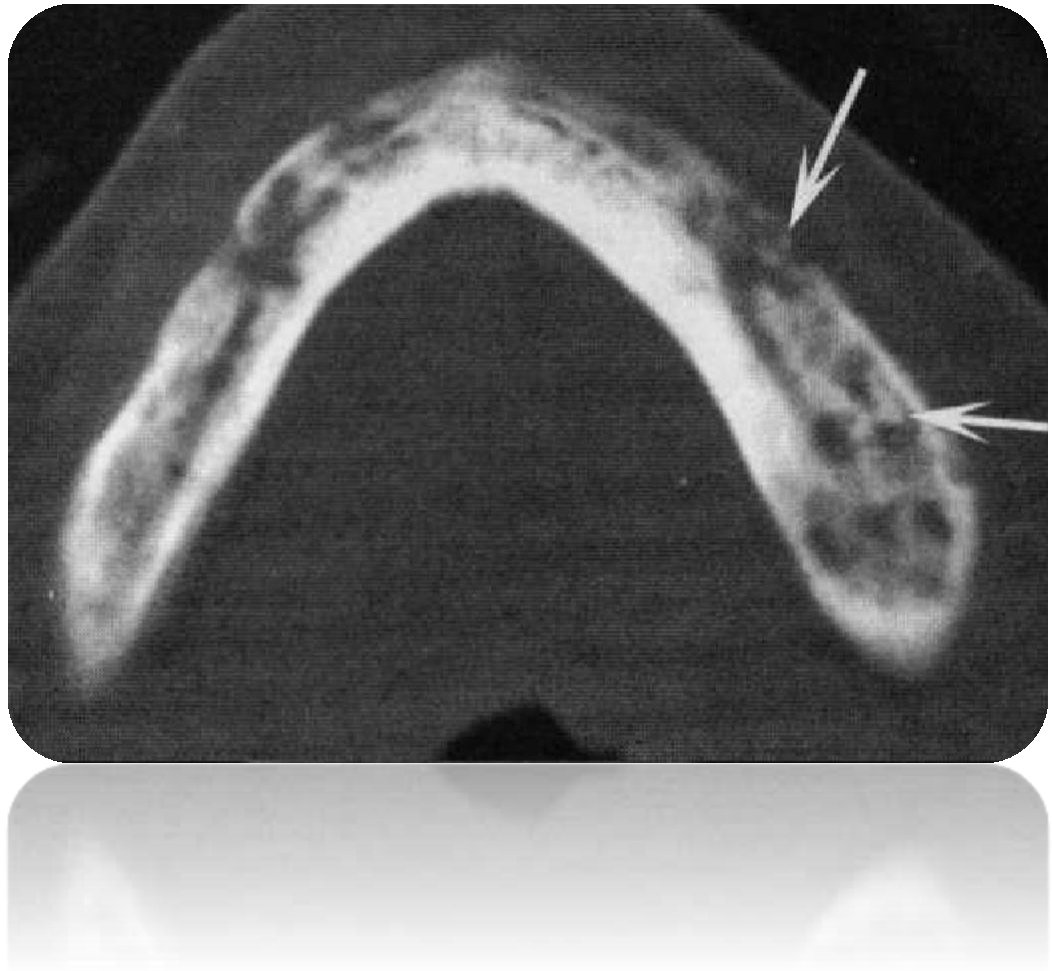
CBCT: Cone beam CT- 3d Imaging modality

Adv:

High contrast

Detects sequestrum and periosteal bone formation

Dent maxillofacial Radiology,2006;35:232-35.

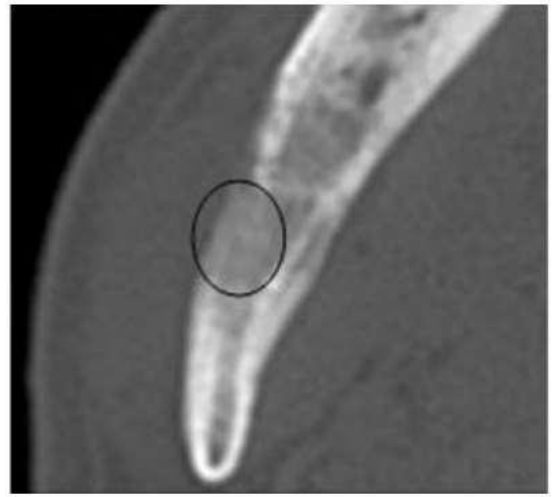
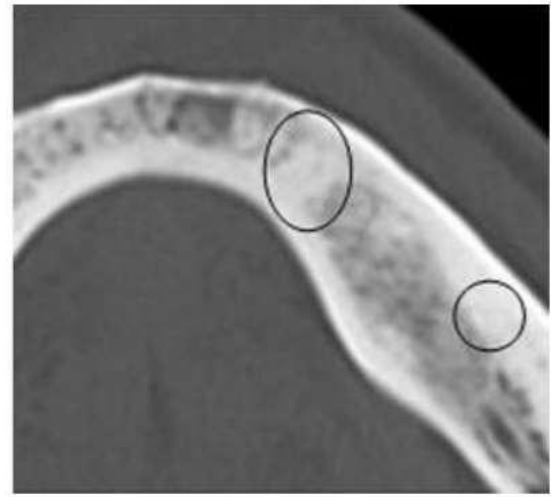


CT FINDINGS

- Tanaka et al 2008 described CT findings of chronic osteomyelitis of the mandible: three types

- the bone-defect pattern
- frosted-glass pattern
- compact-bone pattern

Dent maxillofacial Radiology (2008) 37, 94-103

Dent maxillofacial Radiology (2008) 37, 94-103

SCINTIGRAPHY

- Radionucleide scanning changes are seen as early as 3 days.
- Technetium (Tc-99m) labeled phosphate compound are given intravenously
- Tc-99m concentrate in areas of increased osteoblastic activity and later imaged with a scintillation camera or scanner
- Scintigraphy can confirm a diagnosis of very early osteomyelitis.

Dent maxillofacial Radiology,2006;35:232-35.

- ^{99m}Tc labels the phosphate ions of the bone and reveals any osteoblastic or osteoclastic activity within the affected bone.

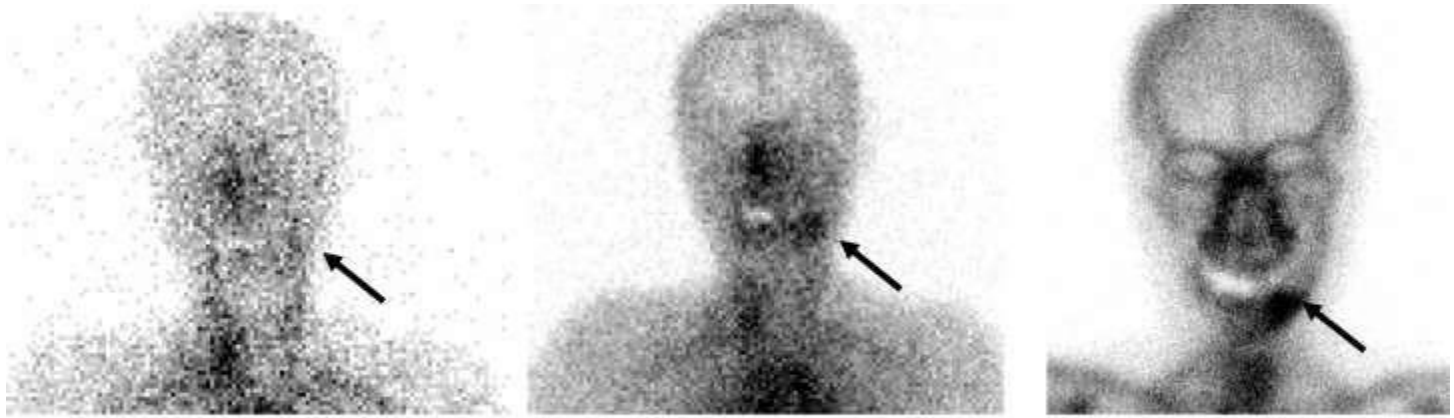
- ^{67}Ga images the infective focus, as radiogallium bound to granulocytes and the osteoclasts. Positive Gallium scan confirm the presence of infective process.

- ^{99m}Tc scan with ^{67}Ga aids in distinguishing OML from malignancy and trauma. Positive findings on both scan indicates infectious disease.

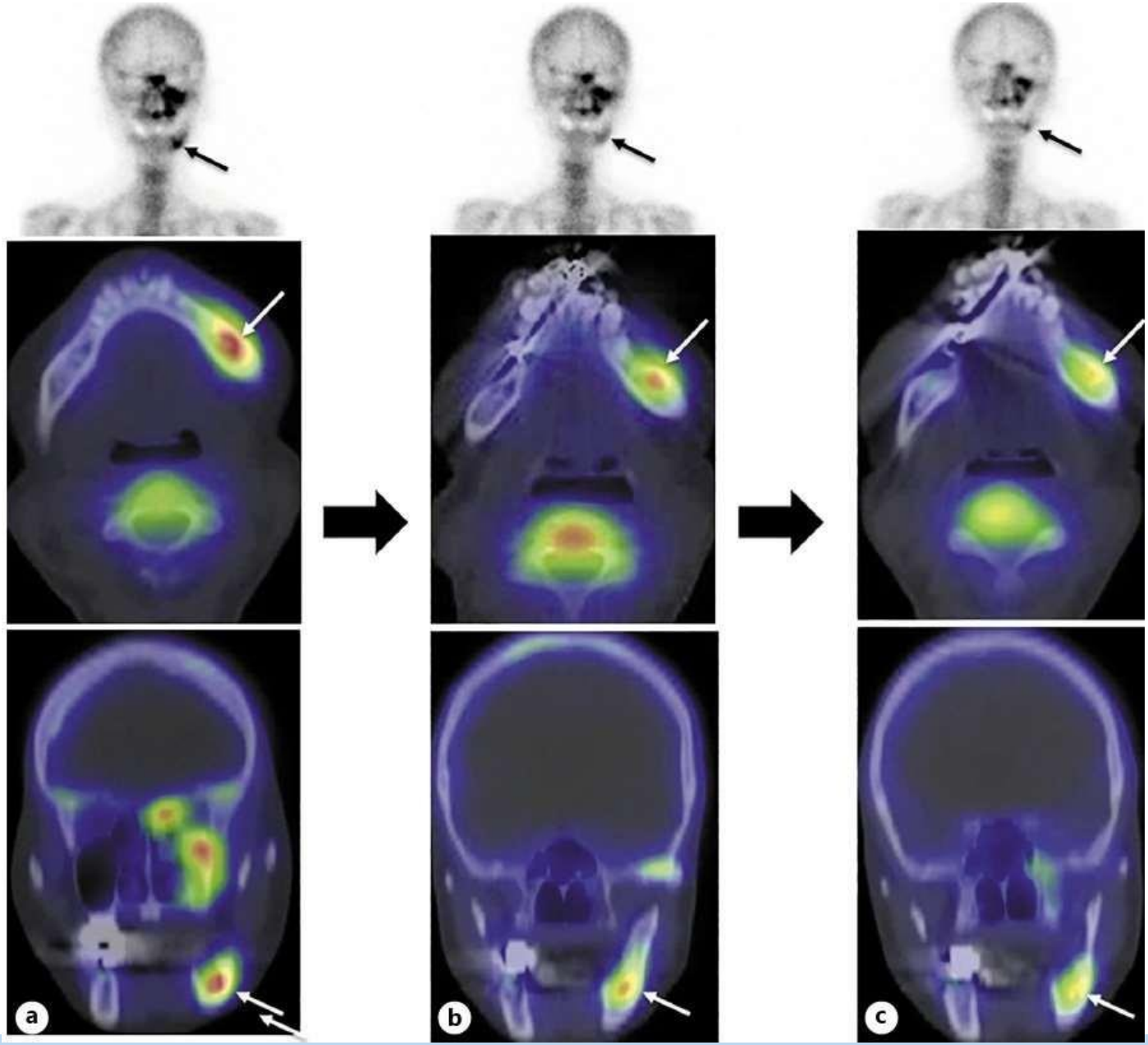
- When Tc scan is positive and Ga scan is negative then OML is not the primary disease

- If ^{67}Ga uptake exceeds ^{99mTc} uptake it indicates active inflammatory disease.

- In chronic OML ^{67}Ga uptake is reduced in the follow up scans is useful indicator for termination of the therapy of OML.



Jpn Dent Sci Rev. 2019 Nov; 55(1): 65–70.



Case Rep Oncol 2021;14:820–825

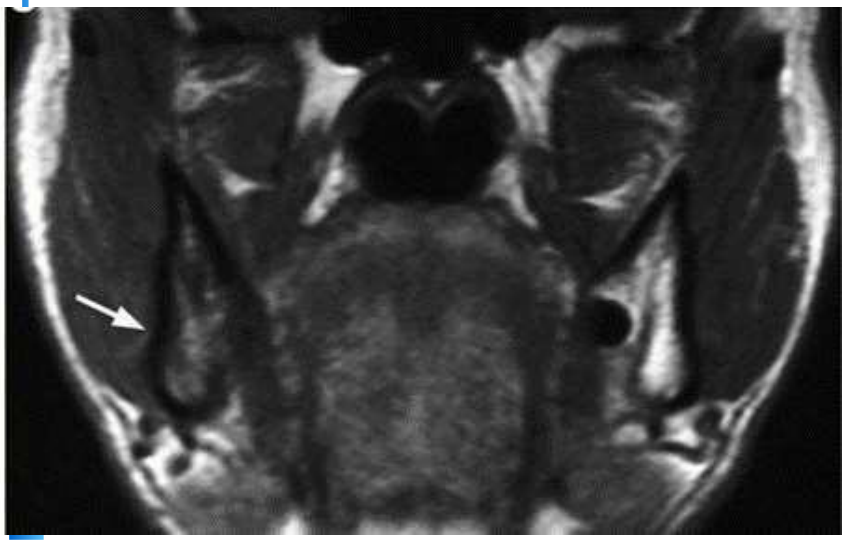
MRI

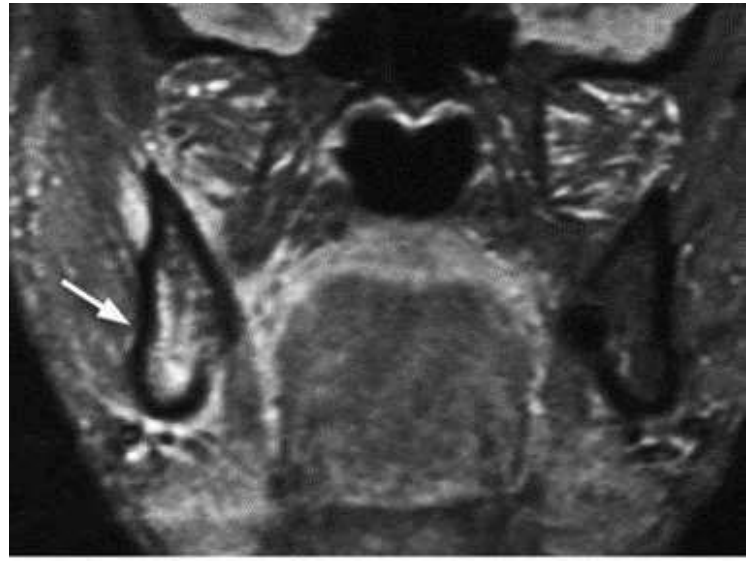
- Depicts bone marrow inflammation & extent of it.
- Distinguishes osteomyelitis from cellulitis

LOW SIGNAL INTENSITY ON T1

MILD HYPER INTENSITY ON T2

Bone sequestrum - well defined dark area





Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008;105:503-11)

OSTEOMYELITIS FINDINGS IN DIFFERENT IMAGING TECHNIQUES

Technique	Advantages	Disadvantages	Sensitivity/ specifity	Main findings
Conventional X-ray	Inexpensive	Late diagnosis	43-75%, 75-83%	Lytic lesions, osteopenia, periosteal thickening, loss of trabecular architecture, new bone apposition
Computed Tomography	Excellent spatial resolution	Cost Availability Radiation	67%/50%	Blurring of fat planes, increased density of fatty marrow, periosteal reaction, sequestra, involucra
MRI	Excellent spatial resolution, early detection, assessment of extent of tissue affected	Cost, availability	82-100%/75-96%	Acute-T1-weighted: low-signal-intensity medullary space. T2-weighted: high signal intensity surrounding inflammatory processes, edema Gadolinium: enhances areas of necrosis Chronic T1- and T2-weighted: low-signal-intensity areas of devascularized fibrotic scarring in the marrow
Three-phase bone scintigraphy	Sensitive, Availability	Nonspecific Further imaging evaluation required	85%/25%	Focal hyperfusion, focal hyperemia, focal bone uptake
Combined bone and gallium scintigraphy	Reliable when clearly positive or negative	Need for two isotopes with multiple imaging sessions over several days	60%/~80%	Localized area of increased uptake

Semin Plast Surg. 2009 May; 23(2): 80–89.

Authors	P. Tiwari [a], R.N. Bera [b], S. Kanojia [c], N. Chauhan [c], M.S. Hirani
Title	Assessing the optimal imaging modality in the diagnosis of jaw osteomyelitis. A meta-analysis British Journal of Oral and Maxillofacial Surgery 2021;59:982-992 Level 1a
Abstract	Osteomyelitis is an inflammatory infectious disease that affects bone and bone marrow. Histopathology remains the gold standard method for diagnosis, but imaging modalities also play an important role. We systematically reviewed five articles with comparative studies on plain films, computed tomography (CT) scan, magnetic resonance imaging (MRI), cone beam computed tomography (CBCT), positron emission tomography (PET), single photon-emission computed tomography (SPECT), scintigraphy, and SPECT/CT. Scintigraphy and SPECT/CT has the highest sensitivity of 100%. PET is only to be used in cases of follow up. Orthopantomography (OPG) is the most common initial diagnostic tool despite its low sensitivity. CT provides the necessary specificity needed for radionuclide imaging, which has the highest negative predictive value of 100% and a positive predictive value >95%. SPECT/CT with 100% sensitivity and 85% specificity can be considered as the imaging modality of choice for initial diagnosis and follow up.

RADIOLOGICAL D/D

- Fibrous dysplasia
- Malignant neoplasm's like

  Osteosarcoma, Squamous cell carcinoma.
- Langerhann’s cell histiocytosis
- Leukemia and Lymphoma

MANAGEMENT

- **Conservative management**
- **Surgical management**

***Goals of the treatment*:**

- Attenuate & eradicate pathological organisms.
- To promote healing.
- Reestablish vascular permeability.

CONSERVATIVE MANAGEMENT

- Complete bed rest
- Supportive therapy includes nutritional support, High protein and caloric diet and adequate multivitamins.
- Dehydration: oral or I/V fluids are given.
- Blood transfusion in cases RBC's and Hemoglobin is low.
- Control of pain with analgesics. Sedation may be employed for keeping patient comfortable and allow to sleep.
- Antimicrobial agents.
- Hyperbaric oxygen (HBO) therapy.
- Special treatment for specific needs.

RECOMMENDED REGIMES

ANTIBIOTIC

- **Regimen I: empirical therapy**

  Aqueous Penicillin, 2 million U IV q4h, plus Metronidazole 500mg

When asymptomatic for 48-72 hrs switch to:

Pencillin V,500mg,post op for 2-4wks.

Regimen II:initial therapy with gram stain results

- *Smear suggestive of mixed infection*: Regimen 1

- *Smear suggestive of Staph infection*:

  Regimen 1 +Oxacillin1g q4h,48-72 hrs,when asymptomatic for 48-72hrs,switch to Dicloxacillin,500mg post op q6h for 2-4 wks or clindamycin,600mgq6h post op

- *Smear suggestive of anaerobic infection:*

  Aqueous Penicillin, 2 million U IV q4h, plus Metronidazole 500mg

  When asymptomatic for 48-72 hrs switch to:

  Pencillin V,500mg,post op for 2-4wks.

For Penicillin allergic patients

Clindamycin 600- 900mg q6h IV then,

Clindamycin 300- 450mg q6h PO.

Cefazolin :,1g q8h IV or IM

Cephalexin :,500 mg q6h post op

THERAPY

- **Closed wound irrigation suction**
- **Antibiotic impregnated beads**

YPERBARIC OXYGEN THERAPY

Marx protocol:

- 100% oxygen is given by mask or hood at 2.4 ATM absolute pressure.
- Each dive is 90 minutes in length and given 5 days in a week for 30 to 60 dives ,twice daily

EFFECTS OF HBO

- Aids in healing
- Improves ontogenesis in lytic areas.
- Rapid dissolution of the sequestra without suppuration.
- Promotes rapid healing

SURGICAL MANAGEMENT

- Incision & drainage
- Extraction of offended teeth
- Debridement with H_2O_2
- Closed catheter irrigation
- Sequestrectomy
- Saucerisation
- Decortication
- Trephenation or fenestration
- Resection and Reconstruction

Topazian Text book of Oral and Maxillofacial Infections, 2002.

COMPLICATIONS OF OML

- *Neoplastic transformation*:

  conversion of immflamation to metaplasia-squamous cell carcinoma 0.2-1.5%

- *Discontinuity defects*

  Spontaneous

  Surgically induced

- *Progressive diffuse sclerosis*

PROGNOSIS:

- Good if proper aggressive and comprehensive therapy as instituted on time.
- Poor in presence of regional or systemic disease.


R

GARRE'S OSTEOMYELITIS

OSTEORADIONECROSIS

- Osteoradionecrosis refers to an inflammatory condition of bone that occurs after the bone has been exposed to therapeutic doses of radiation
- It is characterized by the presence of exposed bone for a period of at least 3 months after the delivery of radiation therapy
- The exposed bone is hypocellular and hypovascular

Clinical and radiographic features

- Posterior mandible…
- Bone exposure…
- Pathologic fracture
- Pain or no pain
- Delayed healing

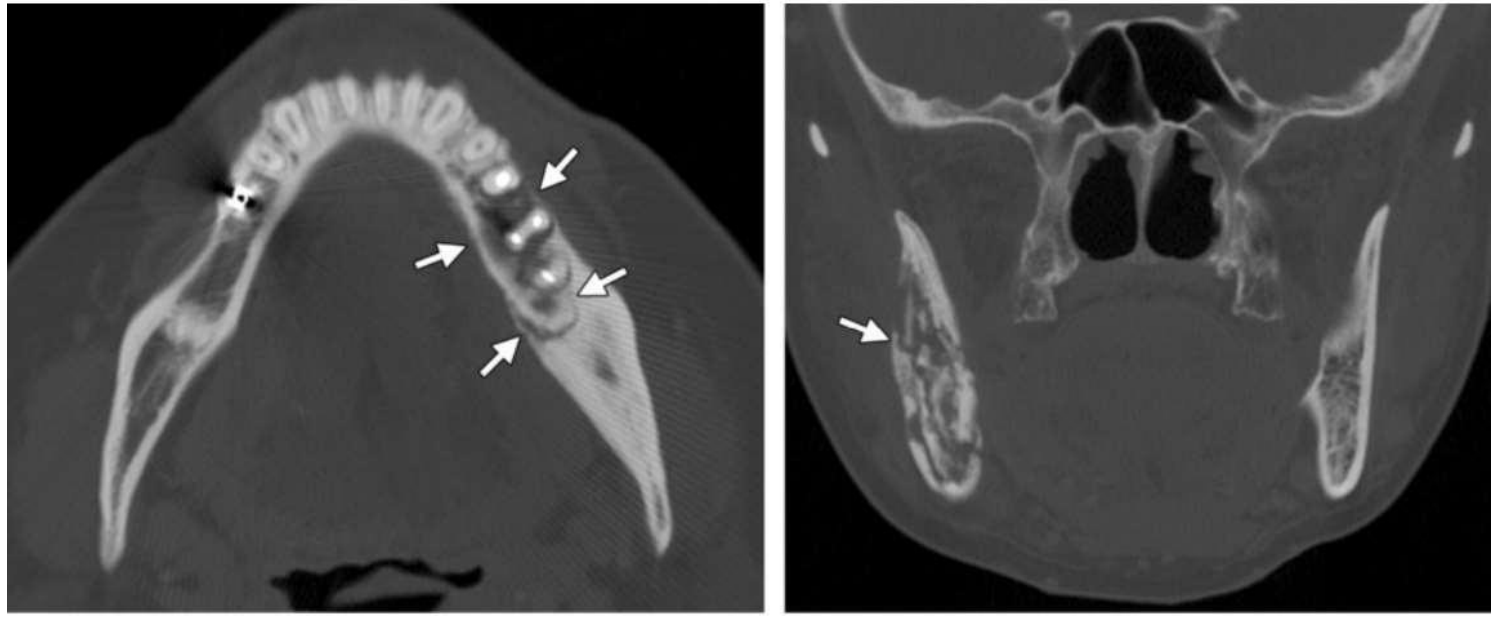
Radiographic features

- Similar to chronic osteomyelitis
- Ill defined periphery
- More bone formation → sclerotic appearance…

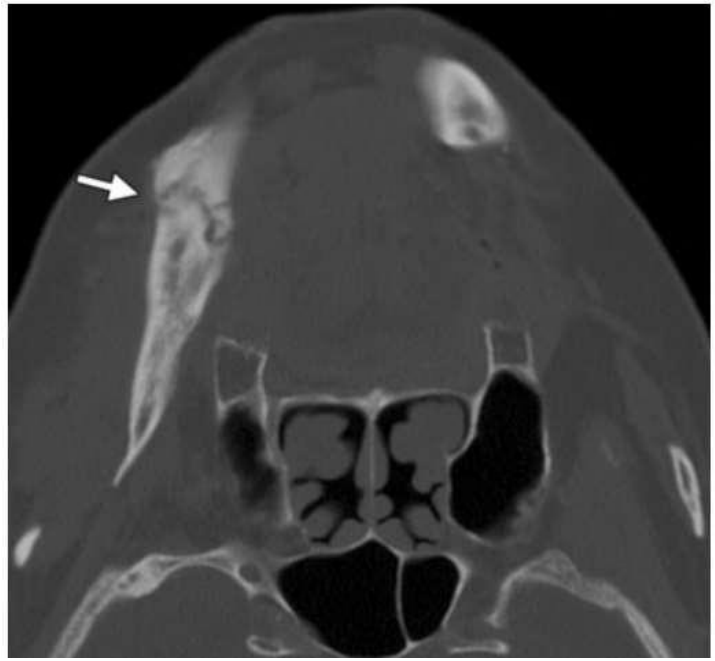
Radiographic features

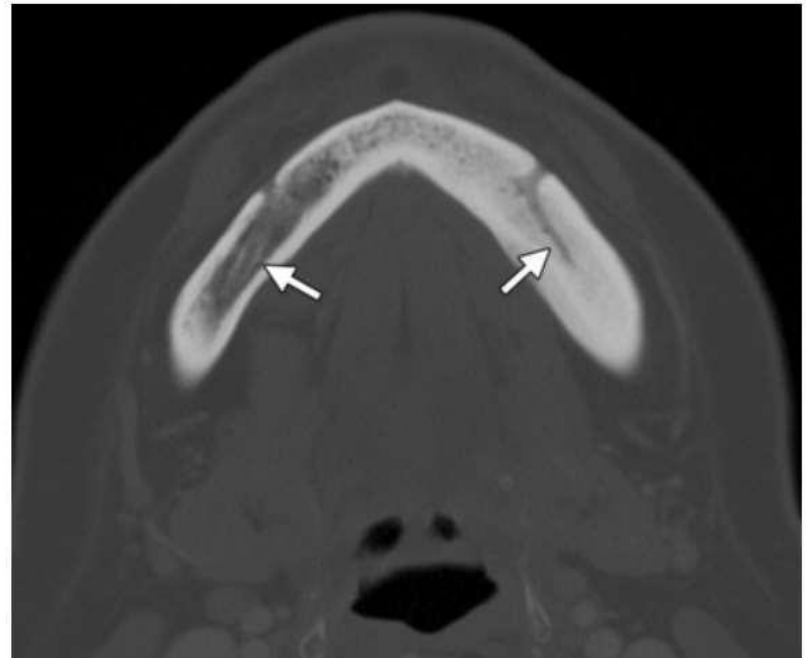
- Scattered regions of radiolucency w, w/o central sequestra
- Uncommon inflammatory new bone….
- Rare bone formation on outer cortex


L



Journal of Medical Case Reports 2011, 5:477





Differential diagnosis

- Malignant neoplasm
- Chronic osteomyelitis (history)

Differential diagnosis

- FD
- Malignancies (OS, SCC)
- LCH
- Lymphoma, luekemia

Diffuse sclerosing osteomyelitis

- Bone metabolism shifts toward increased bone formation…..
- Symptoms are less severe ….

Radiographic features

- Posterior mandible most commonly
- Periphery better defined…..
- Regions of greater and lesser radiopacity…
- More chronic lesions are exceedingly radiopaque…

Radiographic features

- Sequestrum….
- Periosteal new bone (similar to onion skin)
- Outer contour of mandible altered
- External resorption, LD less apparent, PDL enlarged
- May develop draining fistula

CCES

1.All are characteristics of osteomyelitis EXCEPT one. Which one is the EXCEPTION?

a. Development of sequestra.

b. Predominant bacteria are basophils.

c. Acute and chronic phases.

d. Resolves with antibiotic treatment

2. Which medical condition does NOT contribute to osteomyelitis?

a. Hypertension.

b. Osteopetrosis.

c. Diabetes mellitus.

d. Sickle cell anemia.

3. All are characteristics of acute osteomyelitis EXCEPT one. Which one is the EXCEPTION?

a. Primarily mandibular location.

b. Ill-defined periphery.

c. Sclerotic areas initially.

d. Island of nonvital bone.

4. Which periosteal reaction forms several rows of vital bone that parallel each other and resemble onion skin?

a. Proliferative periostitis.

b. Unifocal periosteal reaction.

c. Periosteal hyperplasia.

d. Sclerosing osteitis

5. Which clinical element is unique to osteoradionecrosis?

a. Pain.

b. Swelling.

c. Exposure of bone.

d. Pathologic fracture