

**RADIOGRAPHIC
APPEARANCE OF
COMMON DENTAL
DISEASE**

COMMON DENTAL DISEASES

1-Dental caries

2-Periodontal Diseases

3-Inflammatory lesions of the jaws:

4-Fractures

5- Impacted tooth



1-Dental caries: dental caries is the common infectious disease strongly influenced by diet, affecting 95% of population. Radiography is useful for detecting dental caries because the carious process causes tooth demineralization. The carious lesion (the demineralized area of the tooth that allows greater infiltration of x-rays) is darker (i.e., more radiolucent) than the unaffected portion and may be detected on radiographs. An early carious lesion may not have yet caused sufficient demineralization to be detected radiographically. Intraoral radiography can reveal carious lesions that otherwise might go undetected during a thorough clinical examination. A number of studies have shown the value of dental radiographs by repeatedly demonstrating that approximately half of all proximal surface lesions cannot be seen clinically and may be detected only with radiographs.

Interpretation of Incipient Occlusal Lesions

Radiographs are usually not effective for the detection of an occlusal carious lesion until it reaches the dentin.

Interpretation of Moderate Occlusal Lesions

The moderate occlusal lesion is usually the first to induce specific radiographic changes, prompting a definitive decision regarding the presence of caries. The classic radiographic change is a broad-based, thin radiolucent zone in the dentin with little or no changes apparent in the enamel.





PROXIMAL CARIES

Radiographic detection of carious lesions on the proximal surfaces of teeth depends on loss of enough mineral to result in a detectable change in radiographic density.

Because the proximal surfaces of posterior teeth are often broad, the loss of small amounts of mineral from incipient lesions or the advancing front of more advanced lesions is often difficult to detect on a radiograph. For this reason, the actual depth of penetration of a carious lesion is deeper than may be detected radiographically.

Approximately 40% demineralization is required for radiographic detection of a lesion

Facial, buccal, and lingual caries

Facial, buccal, and lingual carious lesions occur in enamel pits and fissures of teeth. When small, these lesions are usually round; as they enlarge, they become elliptic or semilunar. They demonstrate sharp, well-defined borders. It is difficult to differentiate between buccal and lingual caries on a radiograph.

ROOT SURFACE CARIES

Root surface caries (also called *cemental caries*) involves both cementum and dentin. Its prevalence is approximately 40% to 70% in an aged population. The tooth surfaces most frequently affected are, in order, buccal, lingual, and proximal.

RECURRENT CARIES

Recurrent caries is that occurring immediately next to a restoration. It may result from poor adaptation of a restoration, which allows for marginal leakage, or from inadequate extension of a restoration.

In addition, caries may remain if the original lesion is not completely evacuated, which later may appear as residual or recurrent caries.

Approximately 16% of restored tooth surfaces have recurrent caries.

The radiographic appearance of recurrent caries depends on the amount of decalcification present and whether a restoration is obscuring the lesion.



2-Periodontal Diseases

several distinct yet related disorders of the periodontium are collectively known as periodontal disease. The most common of these are gingivitis and periodontitis. **Gingivitis** is a sequela of infection. It is limited to the marginal gingiva and usually is seen as a common, nonspecific form of the disease. **Periodontitis** is also the result of infection, but it differs from gingivitis in that loss of alveolar bone also occurs. The various types of periodontal disease are caused by different specific infections, which are classified according to their distinctive clinical manifestations. **Some examples are **localized and generalized forms of prepubertal periodontitis (patients 1 to 12 years), **localized and generalized forms of juvenile periodontitis (patients 13 to 20), **a rapidly progressing periodontitis, and **localized and generalized forms of adult periodontitis (usually occurring after 30 years).** These various periodontal diseases all are caused by an infection and all result in deleterious changes in the supporting tissues of the dentition. They differ with respect to cause, pathogenesis, progression, natural history, and response to treatment.

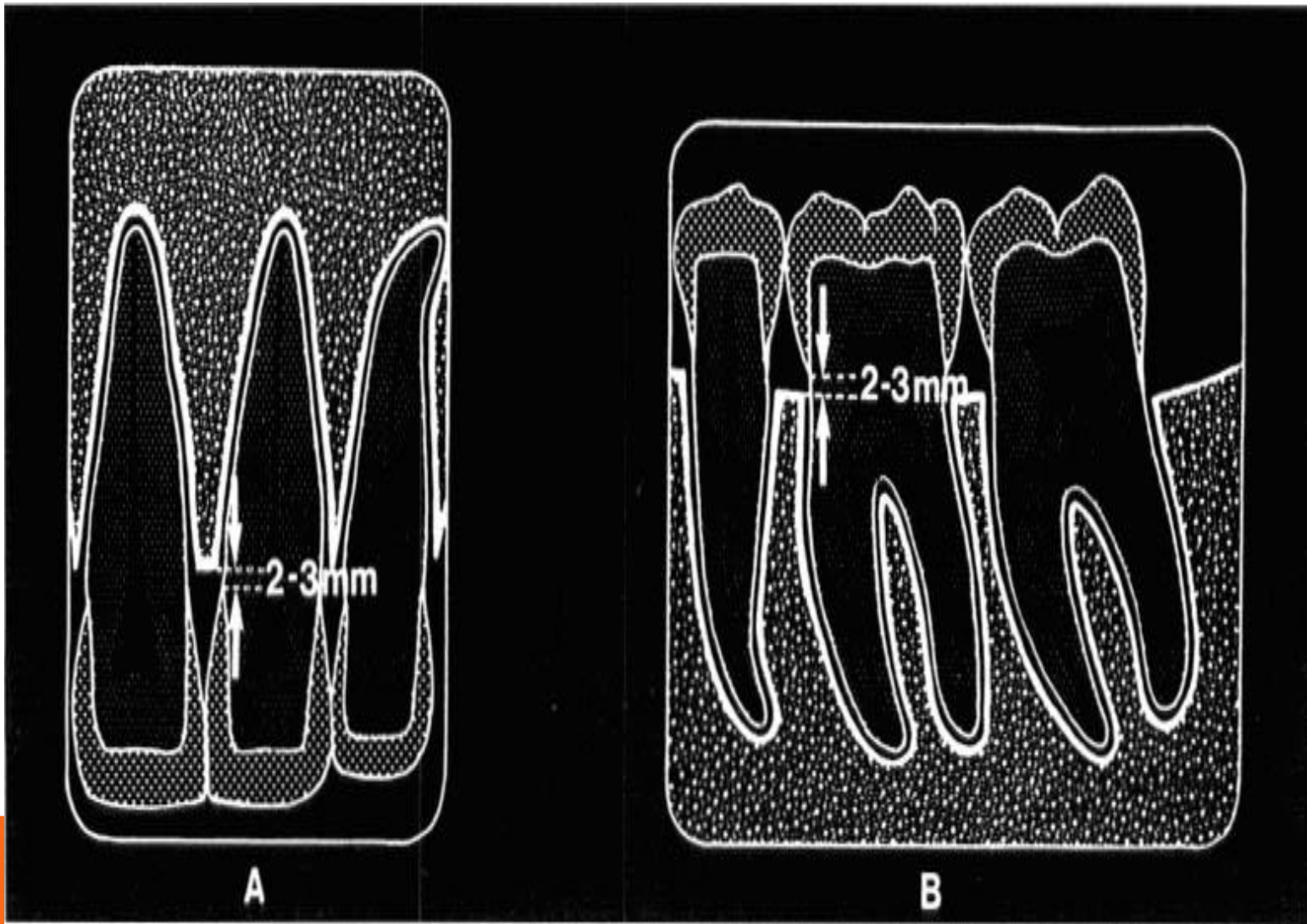
Assessment of Periodontal Disease, contributions of radiographs

Radiographs play an integral role in the assessment of periodontal disease. They provide unique information about the status of the periodontium and a permanent record of the condition of the bone throughout the course of the disease. **Radiographs aid the clinician in identifying the extent of destruction of alveolar bone, local contributing factors, and features of the periodontium that influence the prognosis.** It is important to emphasize that the clinical and radiographic examinations are complementary. The clinical examination should include periodontal probing, a gingival index, mobility charting, and an evaluation of the amount of attached gingiva. Features that are not well delineated by the radiograph are most apparent clinically, and those that the radiograph best demonstrates are difficult to identify and evaluate clinically. Radiographs are an adjunct to the diagnostic process. Although a radiograph demonstrates advanced periodontal lesions well, other equally important changes in the periodontium may not be seen radiographically.

Radiographic features of healthy periodontium

A *healthy* periodontium can be regarded as *periodontal tissue exhibiting no evidence of disease*. Unfortunately, *health* cannot be ascertained from radiographs alone, clinical information is also required. However, to be able to interpret radiographs successfully clinicians need to know the usual radiographic features of healthy tissues where there has been no bone loss.

The only reliable radiographic feature is the relationship between the crestal bone margin and the cemento-enamel junction (CEJ). If this distance is within normal limits (2-3 mm) and there are no clinical signs of loss of attachment., then it can be said that there has been no periodontitis.



Radiographic features of periodontal disease and the assessment of bone loss and furcation involvement

-Acute and chronic gingivitis.:

Radiographs provide no direct evidence of the soft tissue involvement in gingivitis. However, in severe cases of acute ulcerative gingivitis (AUG) where there has been extensive cratering of the interdental papilla, inflammatory destruction of the underlying crystal bone may be observed.

-Periodontitis:

Periodontitis is the name given to periodontal disease when the superficial inflammation in the gingival tissues extends into the underlying alveolar bone and there has been loss of attachment. The destruction of the bone can be either **localized** affecting a few areas of the mouth, or **generalized** affecting all areas.

The rate of this progression and subsequent bone destruction is usually slow and continues intermittently over many years or it may be rapid.


The radiographic features of the different forms of periodontitis are similar; it is the distribution and the rate of bone destruction that varies.

The terms used to describe the various appearances of bone destruction include:

- **Horizontal bone loss**
- **Vertical bone loss**
- **Furcation involvements.**

The terms **horizontal** and vertical have been used traditionally to describe the direction or pattern of bone loss using the line joining two adjacent teeth at their cemento-enamel junctions as a line of reference. The amount of bone loss is then assessed as mild, moderate or severe.

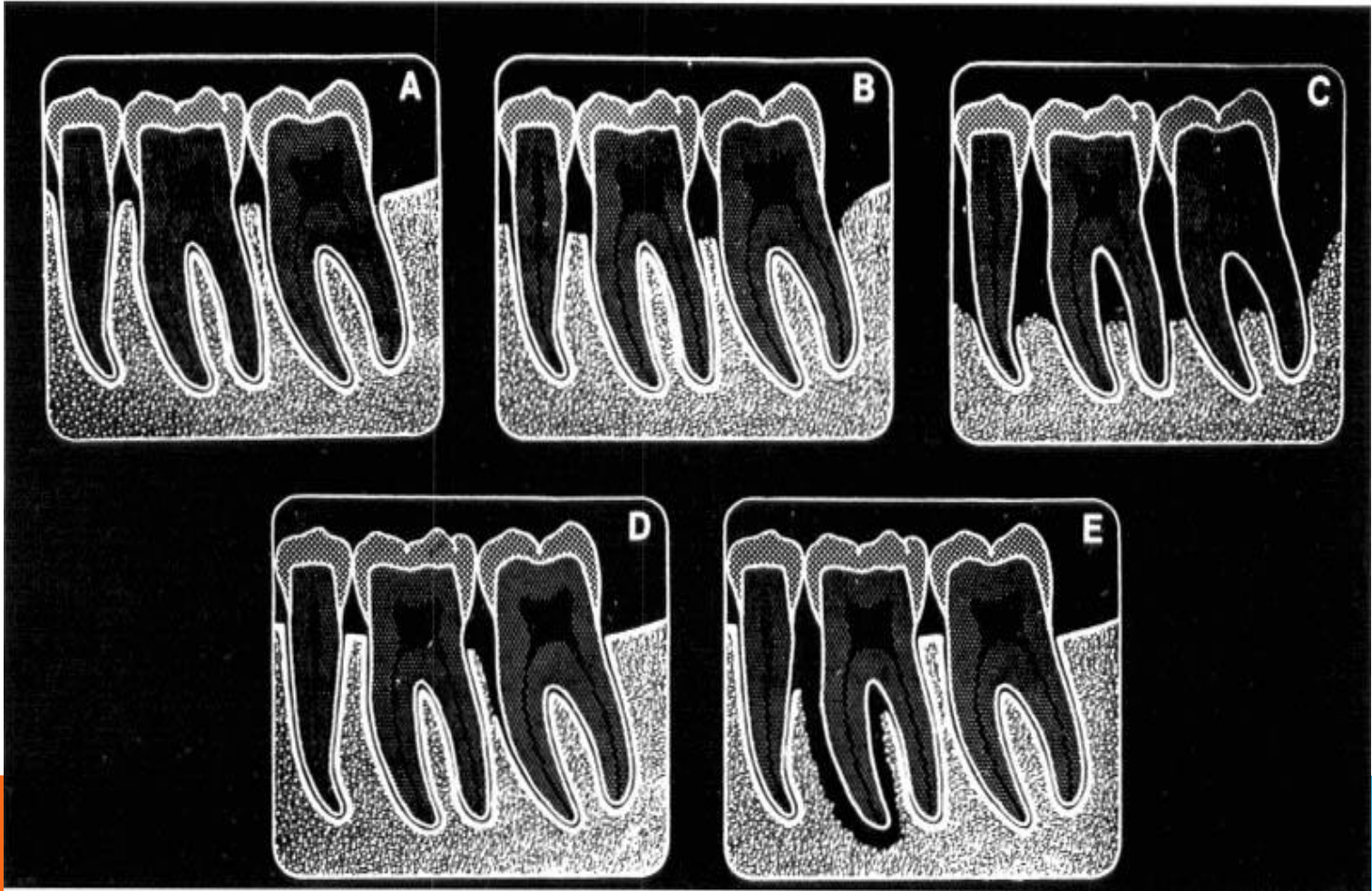
Severe **vertical** bone loss, extending from the alveolar crest and involving the tooth apex, in which necrosis of pulp tissue is also believed to be a contributory factor, is described as a **perio-endo lesion.**

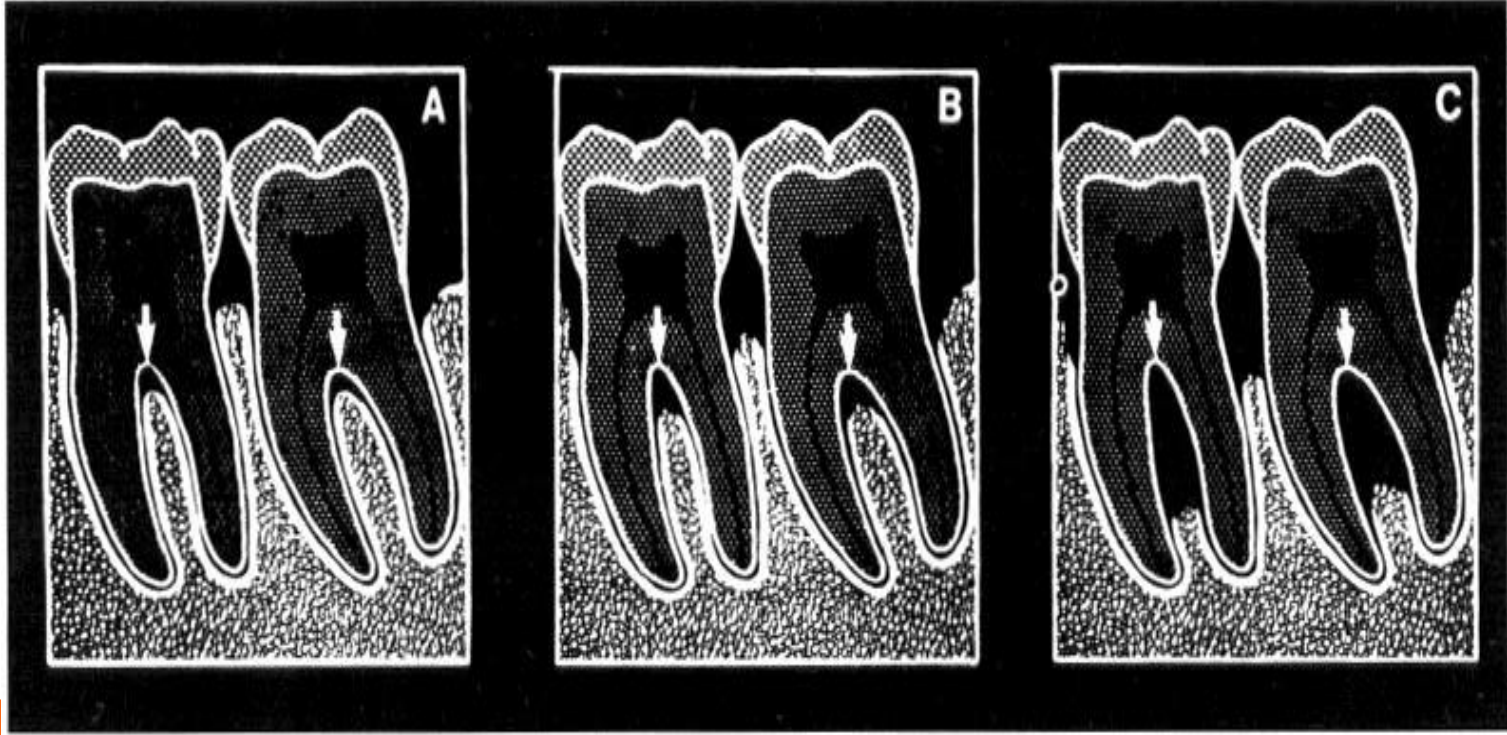


The term **furcation involvement** describes the radiographic appearance of bone loss in the furcation area of the roots which is evidence of advanced disease in this zone.

Although central furcation involvements are seen more readily in mandibular molars, they can also be seen in maxillary molars despite the superimposed shadow of the overlying palatal root. In addition, early maxillary molar furcation involvement between the mesiobuccal or distobuccal roots and the palatal.







3-Inflammatory lesions of the jaws:

inflammatory lesions are by far the most common pathologic condition of the jaws.

The jaws are unique from other bones of the body in that the presence of teeth creates a direct pathway for infectious and inflammatory agents to invade bone by means of caries and periodontal disease.

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.

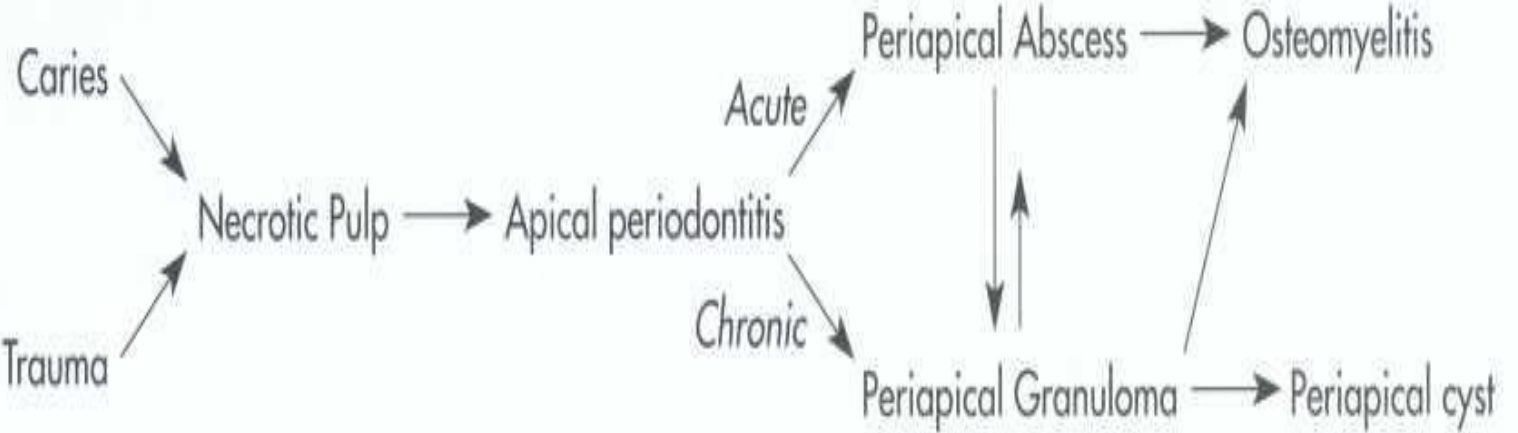


When the infection spreads in the bone marrow and is no longer contained, it is called osteomyelitis.

Another type of inflammatory lesion in bone is characterized by extension of inflammation into the overlying soft tissues; this type of lesion includes periodontal lesions and, an inflammation that arises in the tissues surrounding the crown of a partially erupted tooth.

It must be emphasized that the names of the various inflammatory lesions tend to describe their clinical and radiologic presentations and behavior; however, all have the same underlying disease mechanism.





Radiographic Features

The radiographic features of periapical inflammatory lesions vary depending on the time course of the lesion. Because very early lesions may not show any radiographic changes. More chronic lesions may show lytic or sclerotic changes, or both.

Normal radiographic appearances

A reminder of the complex three-dimensional anatomy of the hard tissues surrounding the teeth in the maxilla and mandible, which contribute to the two-dimensional periapical radiographic image.

The appearances of normal, healthy, periapical tissues vary from one patient to another, from one area of the mouth to another and at different stages in the development of the dentition.

Radiographic Features of periapical lesion

The radiographic features of periapical inflammatory lesions vary depending on the time course of the lesion.



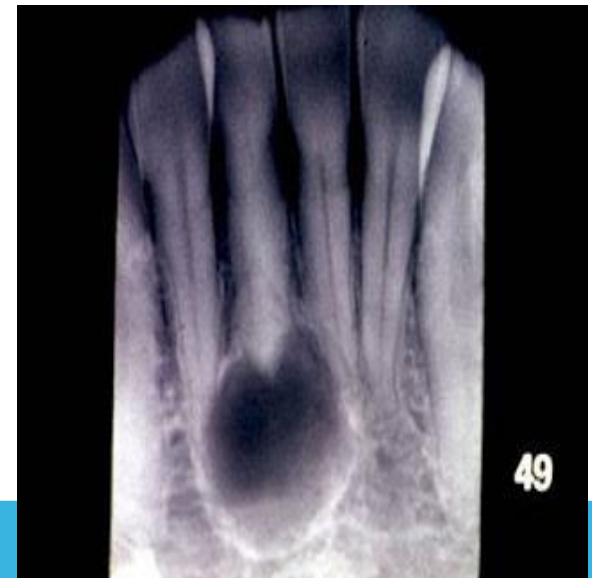
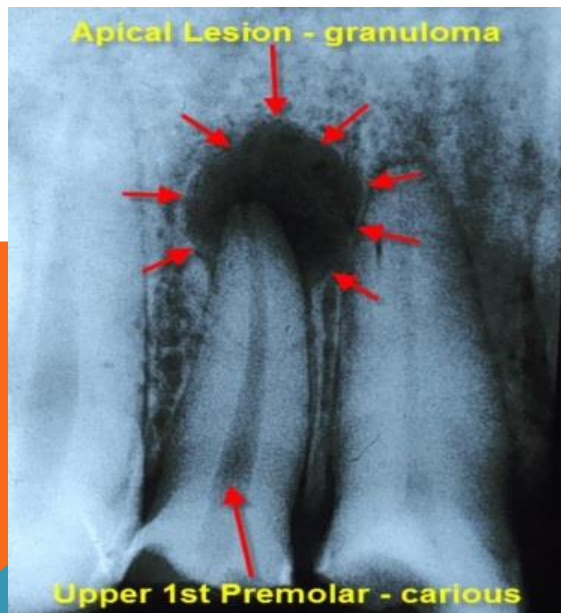
A-Early lesion

Early periapical inflammatory lesions may show no radiographic change in the normal bone pattern. The earliest detectable change is loss of bone density, which usually results in widening of the periodontal ligament space at the apex of the tooth and later involves a larger diameter of surrounding bone. At this early stage no evidence may be seen of a sclerotic bone reaction.



B-Periapical granuloma

Periapical granuloma are the most common periapical radiolucencies encountered in dental practice . radiographically the lesion is not fully dark but it has greyish appearance , there is a loss of lamina dura in relation with the affected tooth , the size of radiolucency is less than 1.5 cm in diameter if the size larger so it consider periapical cyst



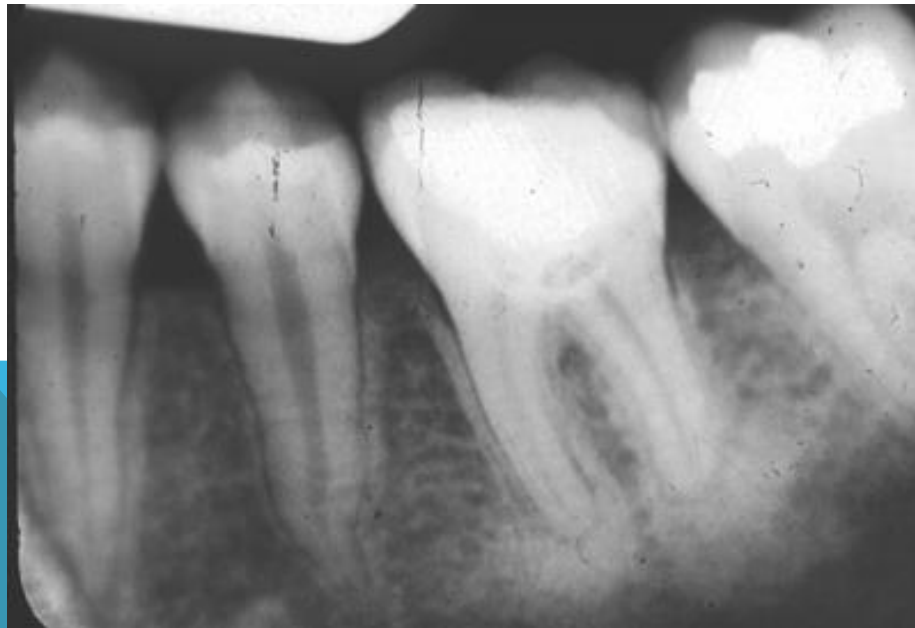
C-Chronic periapical abscess

Radiographic appearance of the lesion may be quite variable, the lesion may have radiolucent appearance with ill-defined borders and in this time it impossible to differentiate from granuloma or cyst.



D-Condensing ostitis

Lesion is localized and present as increased band of radio-opacity associated with root of the tooth



4-FRUCTURES:

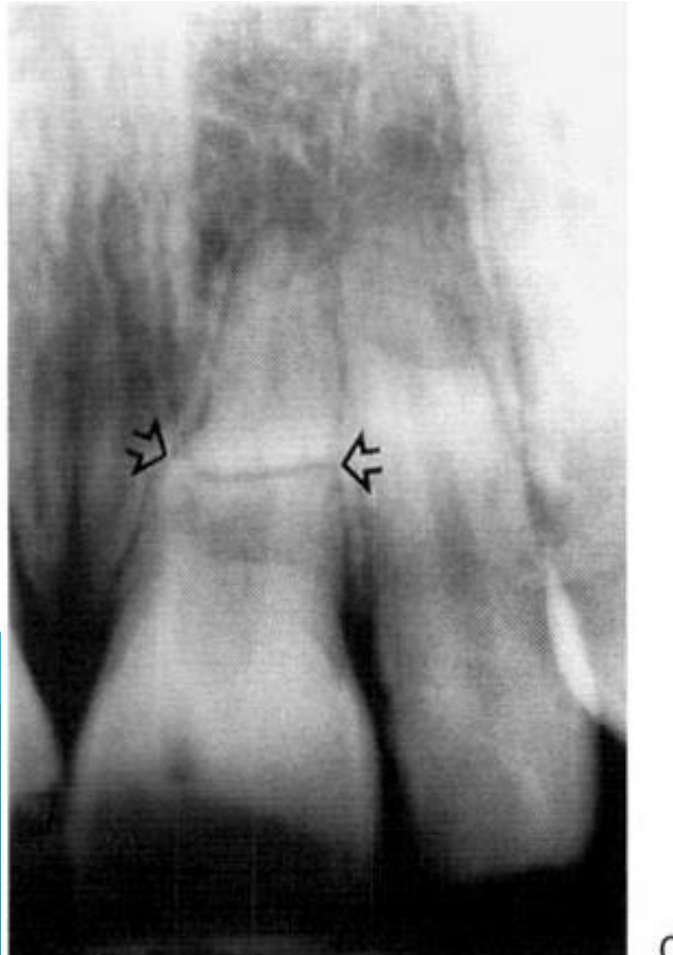
Radiographic signs of fractures

The following are general signs that may indicate the presence of a fracture of bone or tooth:

1. The presence of a radiolucent line (usually sharply defined) w
2. A change in the normal anatomic outline or shape of the structure.
3. A defect in the outer cortical boundary, which may appear as a deviation in the smooth outline.
4. An increase in the density of the bone, which may be caused by the overlapping of two fragments of bone

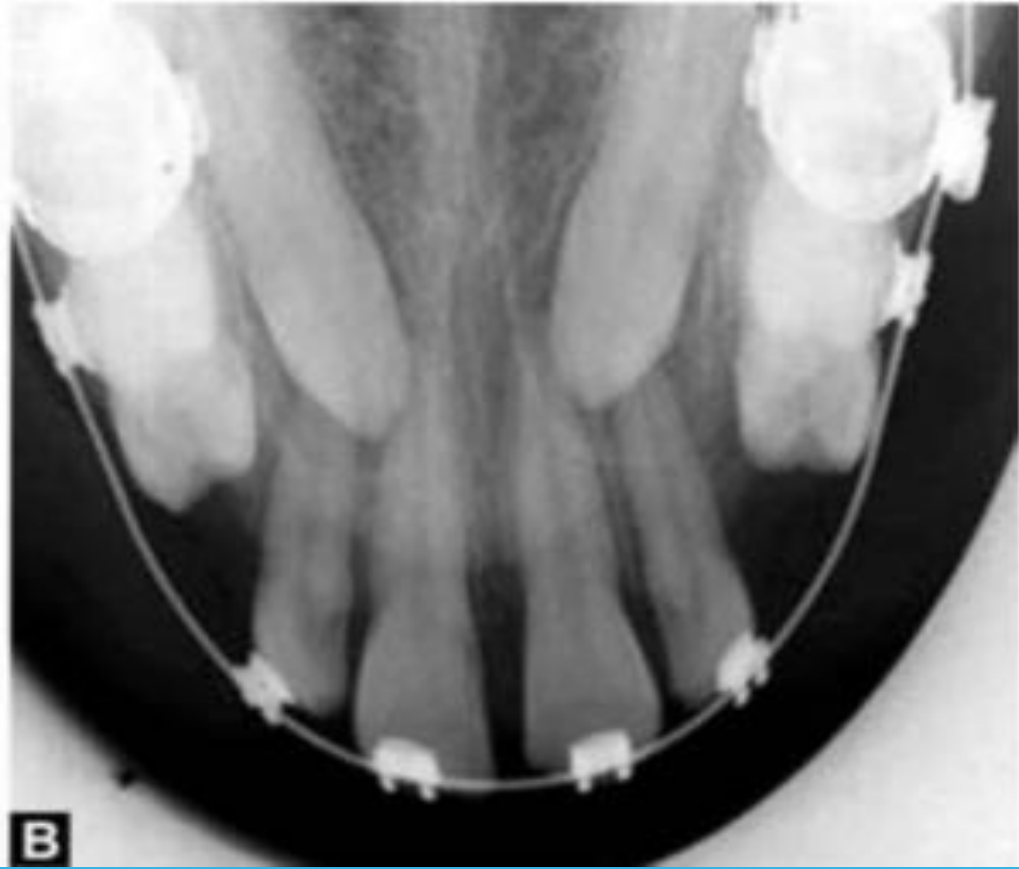
Tooth Fracture

Intraoral periapical films (a minimum of two) should be taken at differing horizontal angulations of the x-ray beam. A panoramic film may serve as a survey film, but it may not have the image detail to reveal a non-displaced root fracture



5- Impacted tooth is one that fails to erupt into the dental arch within the expected developmental window. Because impacted teeth do not erupt, they are retained throughout the individual's lifetime unless extracted or exposed surgically. Mandibular third molars are more commonly impacted than their maxillary counterparts. As a general rule, all impacted teeth must be removed, except canine teeth; canines do not need surgery and may just remain buried and give no further problems.

Accurate diagnostic imaging is an essential requirement to derive the correct diagnosis and optimal treatment plan, as well as monitor and document the treatment progress and final outcome. Intra oral periapical and occlusal films can provide this.



THANK YOU

