Radiographical interpretations of common diseases

Dr. Ahmed Jamal

collage of dentistry / university of Al-Maarif

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COMMON DENTAL DISEASES

1-Dental caries

2-Periodontal Diseases

1-Dental caries

Dental caries, the most common disease in the mouth, is also the most common disease of the entire body, 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 (more radiolucent) than the unaffected portion and may be detected on radiographs.

A clinical examination may be able to identify carious lesions on the occlusal and exposed smooth surfaces of the teeth.

However, it is nearly impossible to clinically identify caries occurring on the proximal surfaces of teeth (interproximal caries) unless there has been cavitation.

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.

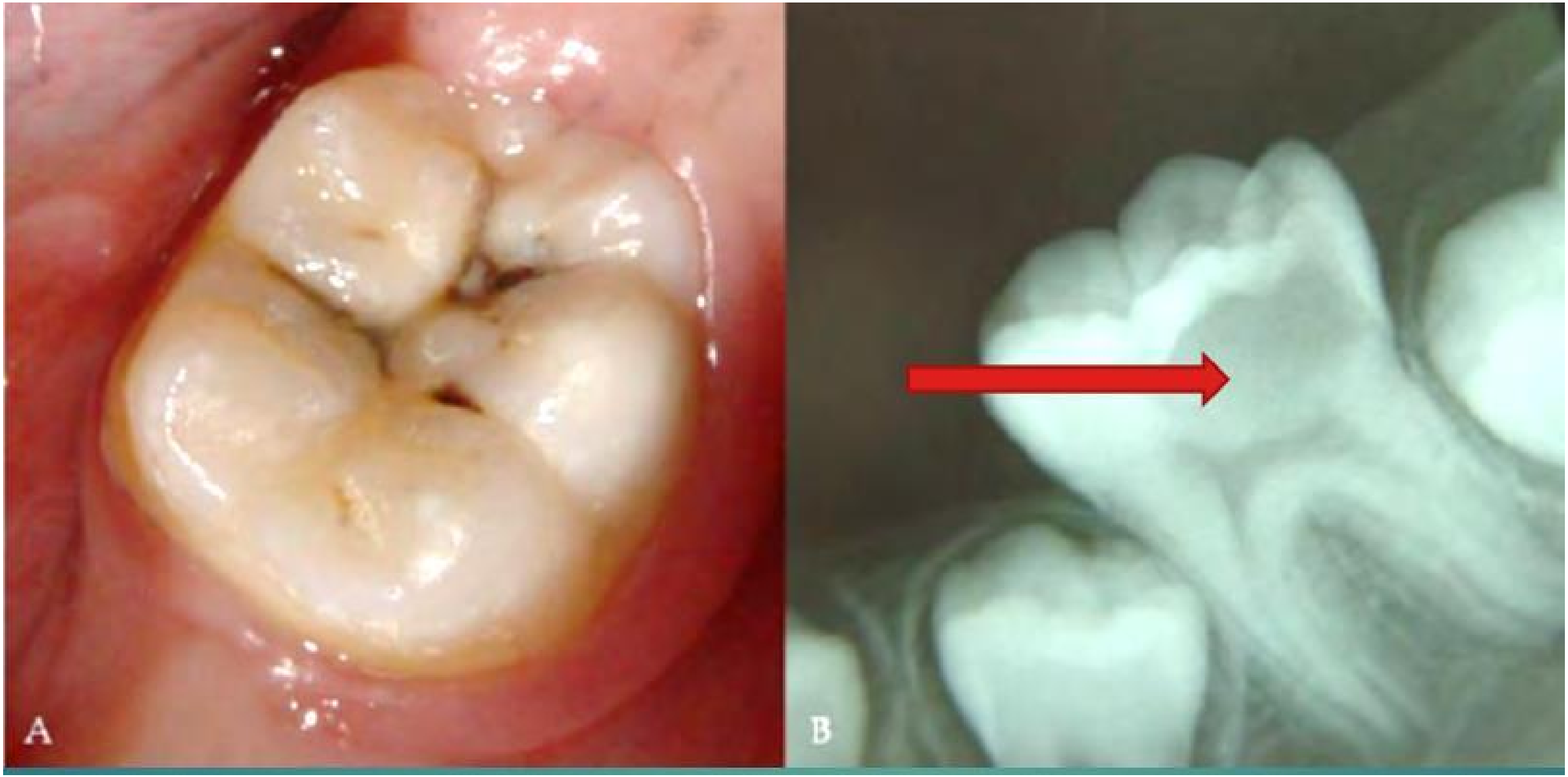
1. Interpretation of Dental Caries (DC) regarding to its location

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

Moderate Occlusal DC:

The moderate occlusal lesion is usually the first to induce specific radiographic changes.

The classic radiographic change is a broad-based, thin radiolucent zone in the dentin with little or no changes apparent in the enamel.


A
B

PROXIMAL CARIES

Interproximal carious lesions are most commonly found in a region that extends between the contact points of teeth apically to near the free gingival margin. 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. Approximately 40% demineralization is required for radiographic detection of a lesion. Bitwing intra oral film used to detect the proximal caries.

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.

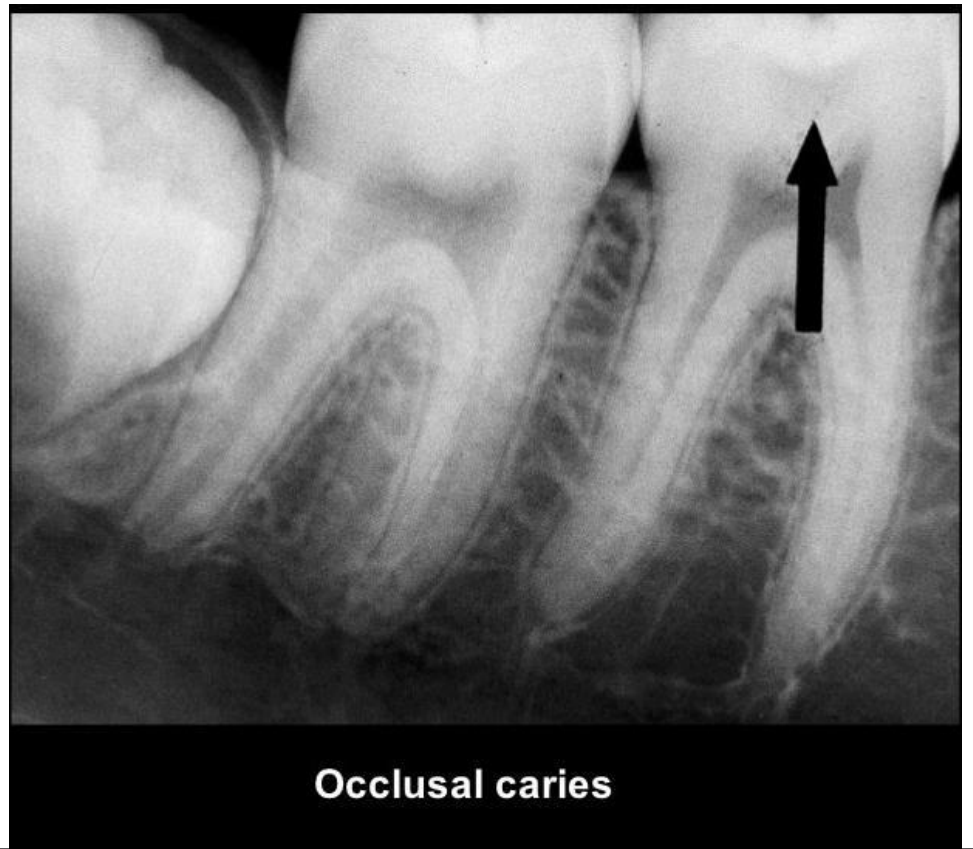
It is difficult to differentiate between buccal and lingual caries on a radiograph.

PROXIMAL CARIES

occlusal caries

A thorough clinical examination is the method of choices for detection of occlusal caries.

Because of superimposition of dense buccal and lingual enamel cups early occlusal caries is difficult to see on a dental radiograph



Occlusal caries

ROOT SURFACE CARIES

Caries (also called cemental caries) involves both cementum and dentin.
Its prevalence is approximately40% 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,

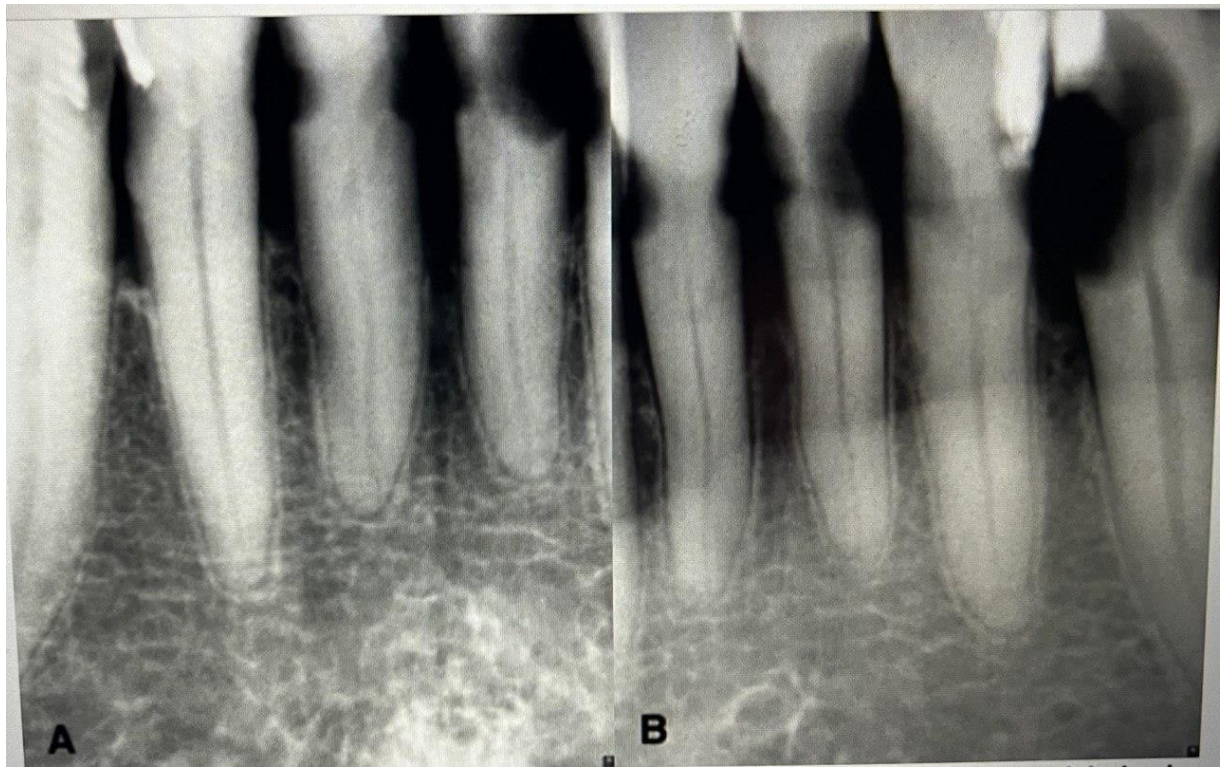
which later may appear as residual or recurrent caries.

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

Rampant caries

is the term used to describe rapid progression with severe and widespread involvement.

This is most often seen in young children who have poor oral hygiene habits coupled with poor dietary habits (e.g., going to sleep with a bottle of milk or juice). Imaging examinationsof these patients can demonstrate advanced, generalized caries, involvingsmooth surfaces and teeth that usually do not present carious lesions.



2-Periodontal Diseases

The most common of periodontal disease are **gingivitis and periodontitis.**

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.

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.

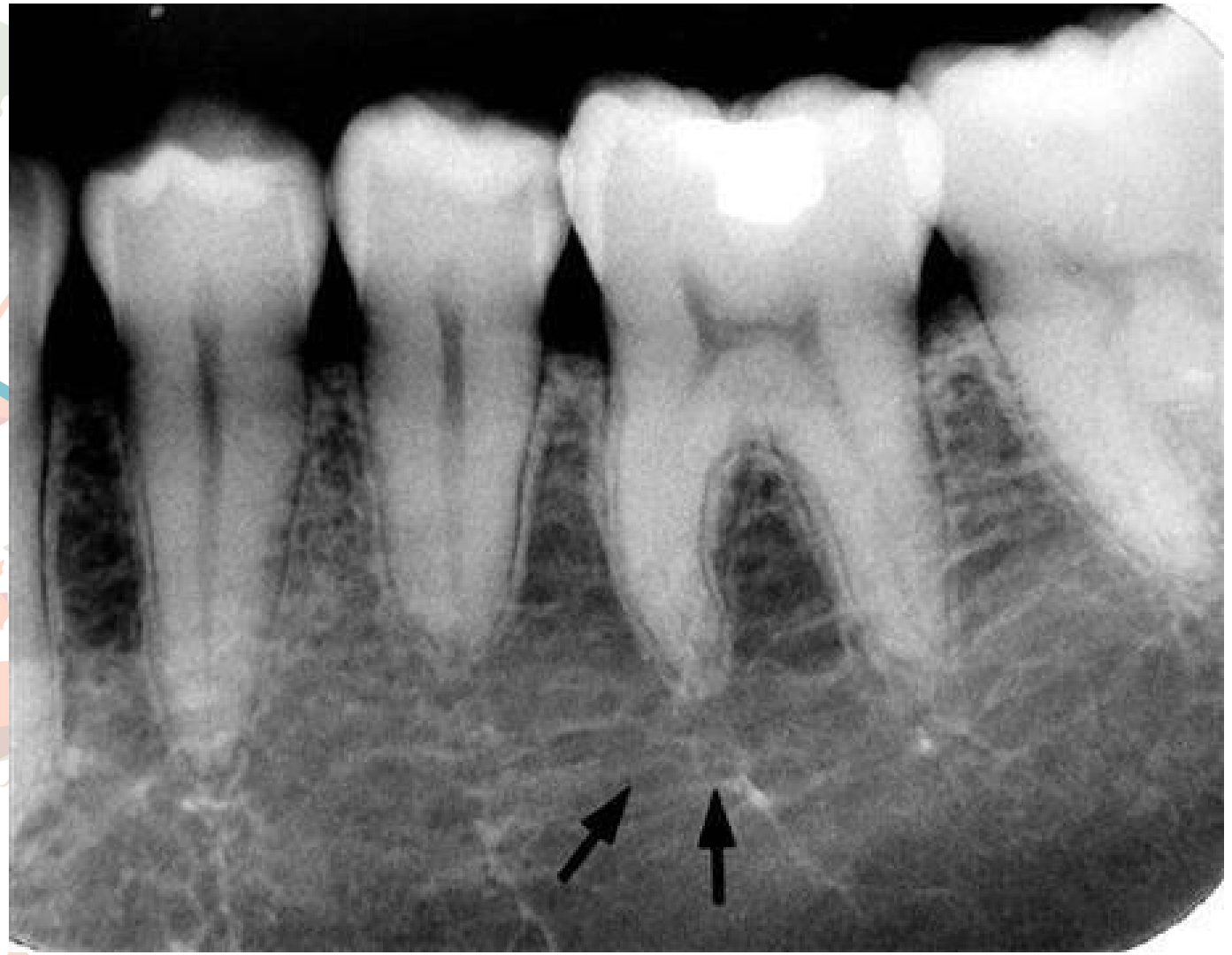
Radiographic features of healthy periodontium

A healthy periodontium can be regarded as periodontal tissue exhibiting no evidence of disease.

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

Acute and chronic gingivitis

Radiographs provide no direct evidence of the soft tissue involvement in gingivitis.

Periodontitis

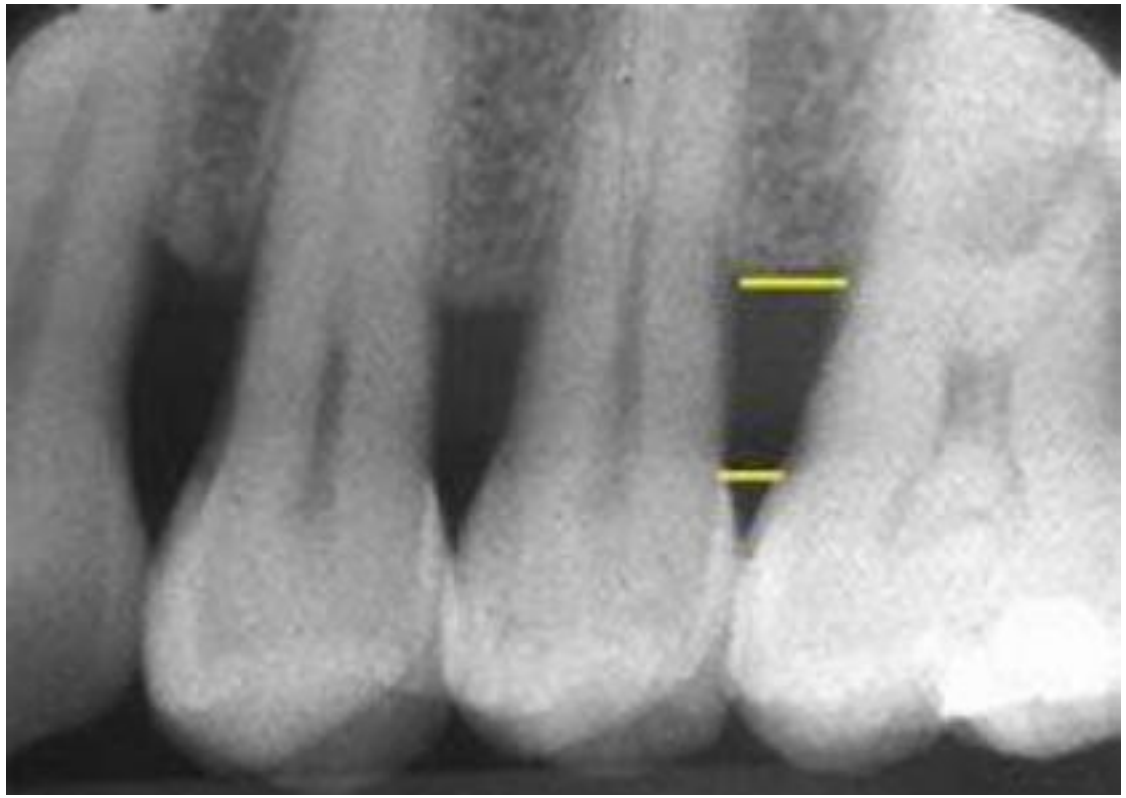
Periodontitis is the name given to periodontal disease when the superficial inflammation in the gingival tissues extends into the underlying alveolar bone and there has been loss of attachment.

The destruction of the bone can be either localized affecting a few areas of the mouth, or generalized affecting all areas.

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

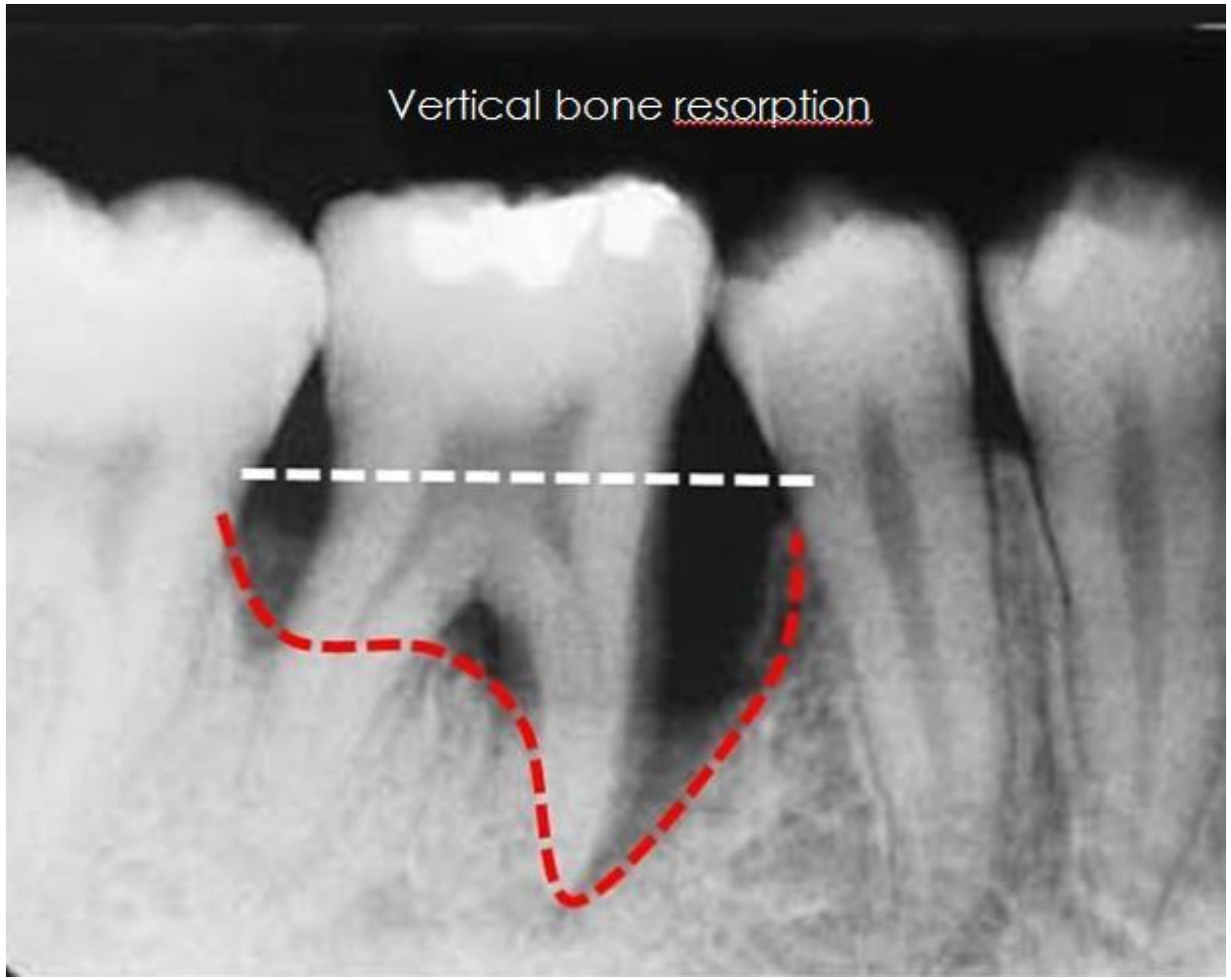
- **Horizontal bone loss**
- **Vertical bone loss**
- **Furcation involvements.**

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.



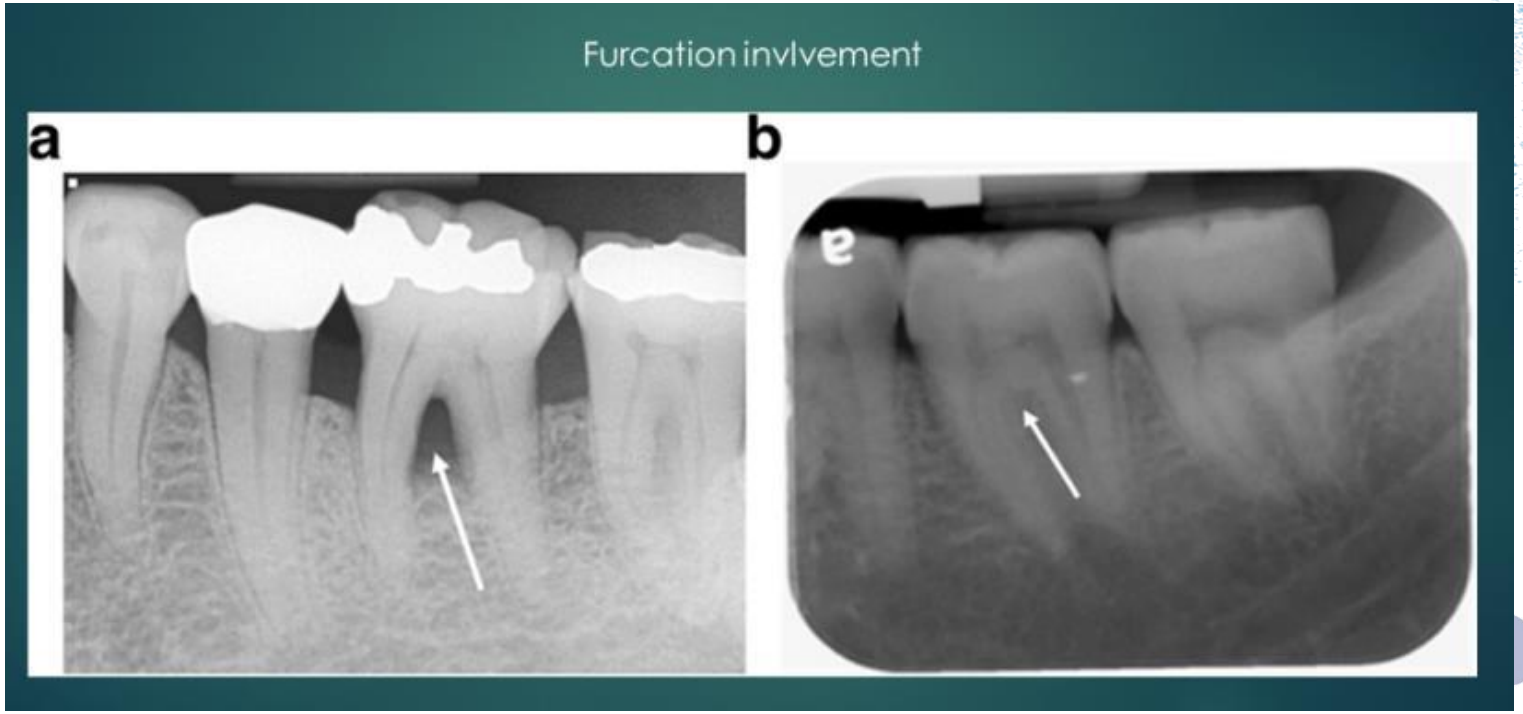
Horizontal bone loss

Severe vertical bone loss, extending from the alveolar crest and involving the tooth apex,



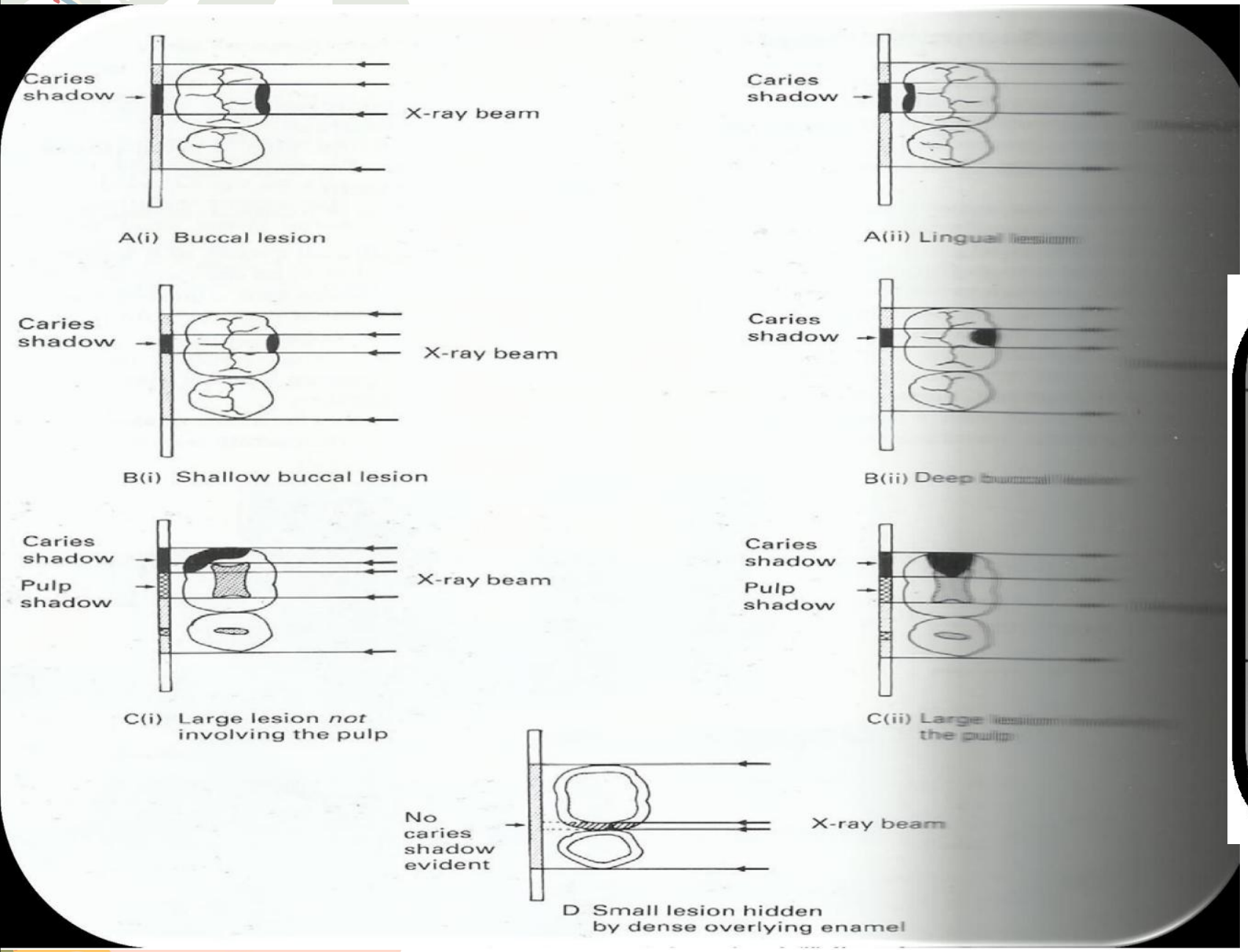
The term furcation involvement describes the radiographic appearance of bone loss in the furcation area of the roots which is evidence of advanced disease in this zone.

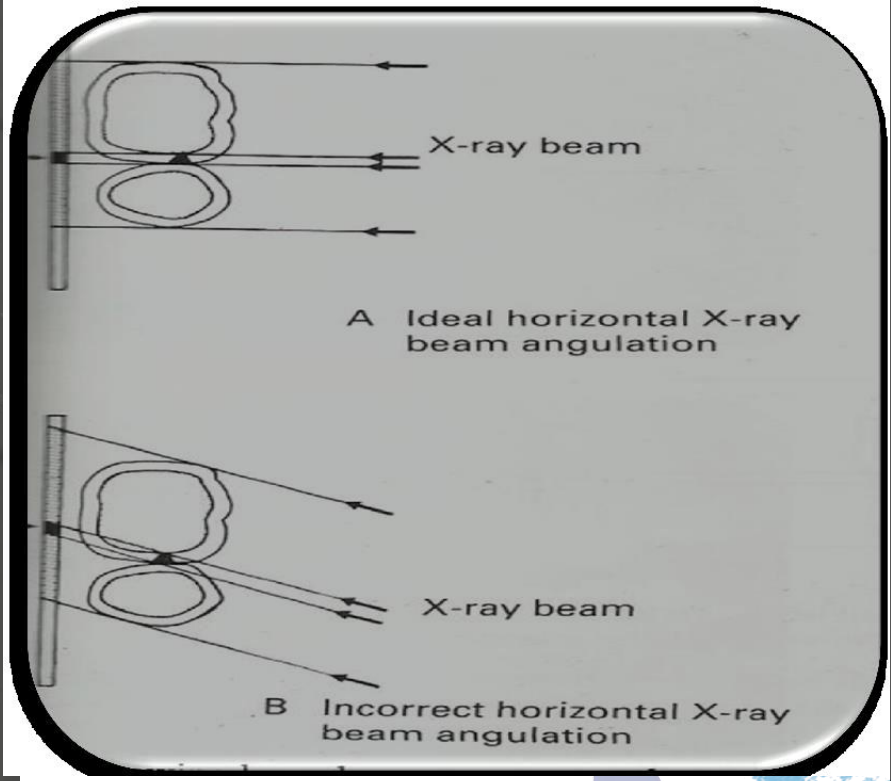
Although central furcation involvements are seen more readily in **mandibular molars**, they can also be seen in maxillary molars l



limitation of radiographic diagnosis of caries.

- Carious lesions are usually larger clinically than they appear radiographically and very early lesions are not evident at all.
- Technique variations in film and x-ray beam position can affect the image of the carious lesions (incorrect horizontal angulations make carious lesion confirm in the enamel to be progressed into dentin).
- Exposure factors can affect the overall radiographic contrast and thus affect the appearance or size of carious lesion on radiograph.
- Superimposition and two dimensional image mean that the following features cannot always be determined:
  - The exact site of a carious lesion e.g. buccal or lingual
  - The bucco-lingual extent of a lesion
  - The distance between the carious lesion and pulp horn
  - The presence of an enamel lesion (density of the overlying enamel may obscure the zone of decalcification).
  - The presence of recurrent caries (existing restorations may completely overlie the carious lesion)


Caries shadow
X-ray beam
A(i) Buccal lesion
Caries shadow
A(ii) Lingual lesion
Caries shadow
X-ray beam
B(i) Shallow buccal lesion
Caries shadow
B(ii) Deep buccal lesion
Caries shadow
Pulp shadow
X-ray beam
C(i) Large lesion not involving the pulp
Caries shadow
Pulp shadow
C(ii) Large lesion involving the pulp
No caries shadow evident
X-ray beam
D Small lesion hidden by dense overlying enamel


X-ray beam
A Ideal horizontal X-ray beam angulation
X-ray beam
B Incorrect horizontal X-ray beam angulation

THANK YOU