

Radiographic interpretation of caries lesions and periodontal disease

Lecture 9

Imad Brinjikji

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Caries

- Bitewing Film primarily.
- Periapical film also used (parallel technique), bisecting angle technique is NOT recommended.
- Low kVp, high contrast (short scale).

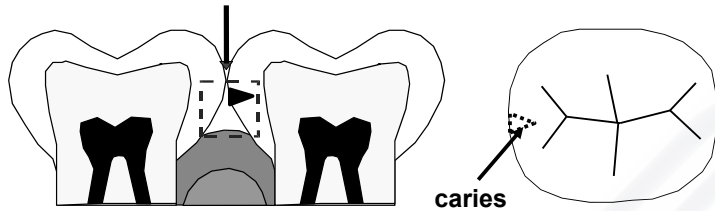
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Caries

- The higher the KV, the less the contrast on the radiograph.
- Radiographs aid in the detection of some caries lesions (but NOT all caries may be detected radiographically).
- If appeared, caries is shown on radiographs as a radiolucency.
- The area between contact and free gingival margin is susceptible for caries.

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Caries



- Approximately 30% demineralization is required for radiographic detection of a lesion.
- The thickness of the tooth buccolingually masks the carious lesion when it is small.
- The actual depth of penetration of a carious lesion is deeper clinically than radiographically.

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Caries

Factors affecting caries diagnosis:

- Buccolingual thickness of tooth.
- Two-dimensional film.
- X-ray beam angle.
- Exposure factors.

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Carious lesions may be classified as:

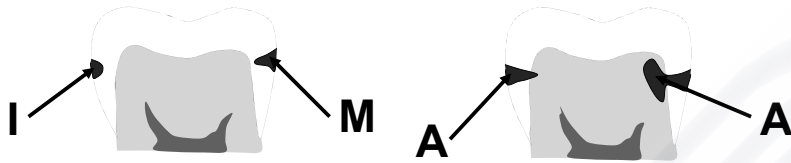
- I. Proximal caries
- II. Occlusal caries
- III. Buccal / lingual caries
- IV. Root caries
- V. Recurrent caries
- VI. Radiation caries

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I. Proximal caries

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I. Proximal caries

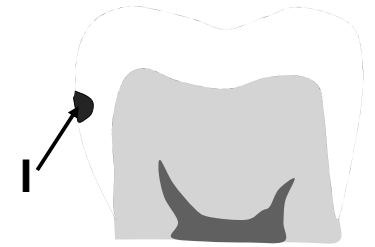


I = Incipient
M = Moderate
A = Advanced
S = Severe



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I. Proximal caries

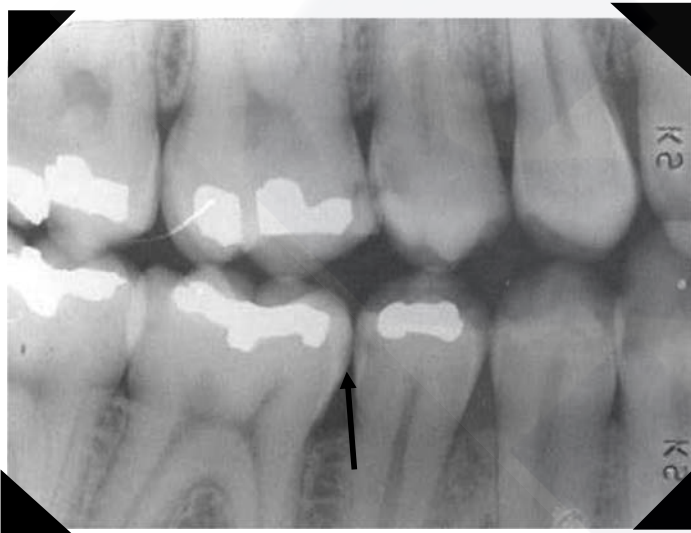


Incipient Interproximal Caries

- Up to half the thickness of enamel.
- Usually not restored unless patient has high caries activity.

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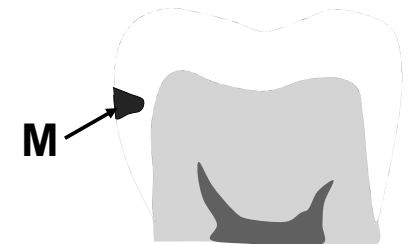
I. Proximal caries



Incipient

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I. Proximal caries

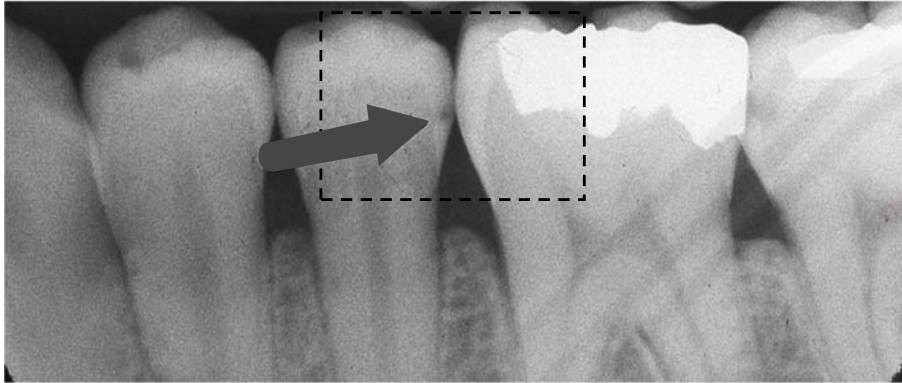


Moderate Interproximal Caries

- More than half-way through the enamel (up to DEJ).

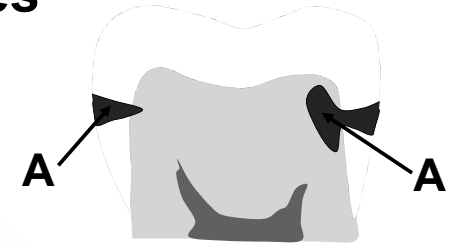
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I. Proximal caries



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I. Proximal caries

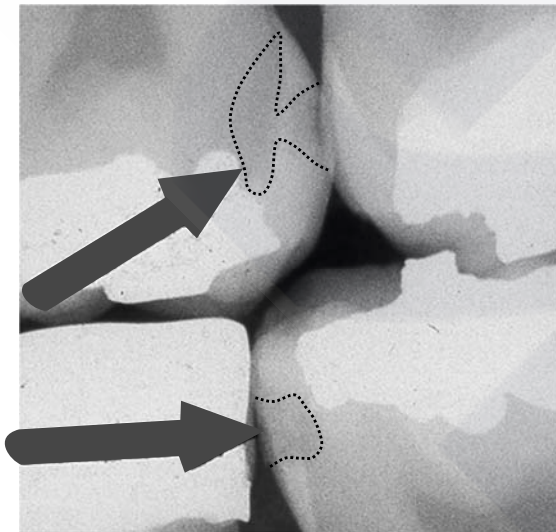


Advanced Interproximal Caries

- From DEJ to half-way through the dentin

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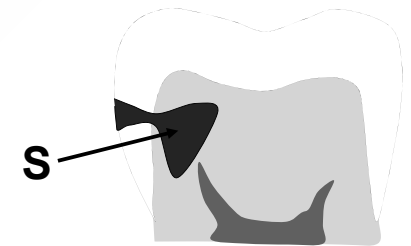
I. Proximal caries



Advanced

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I. Proximal caries



Severe Interproximal Caries

- More than halfway through the dentin.

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I. Proximal caries



Severe

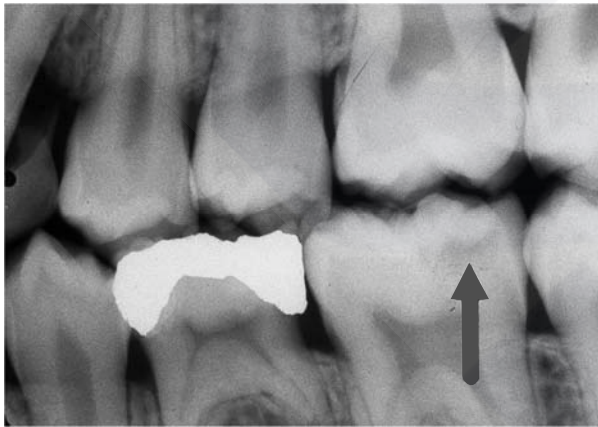
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II. Occlusal Caries

- Must have penetrated into dentin, or more than 1/3 of the buccolingual thickness of the enamel is involved.
- Diagnosed from clinical exam
- Sharp explorer may contribute to spread of caries

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II. Occlusal caries



Occlusal

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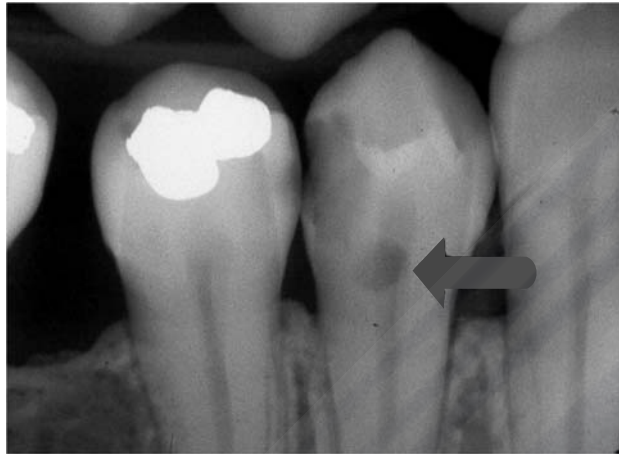
Buccal/Lingual Caries

Use clinical exam

Can't determine depth

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III. Buccal/lingual caries



Buccal/lingual

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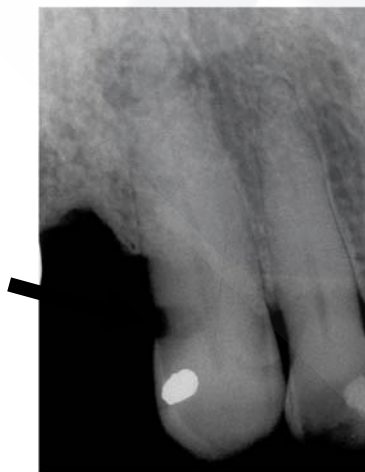
Root Caries

Older patients with recession or periodontitis

Xerostomia may be present

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IV. Root caries



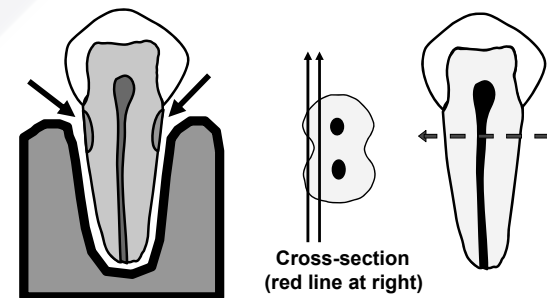
Root caries

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IV. Root caries

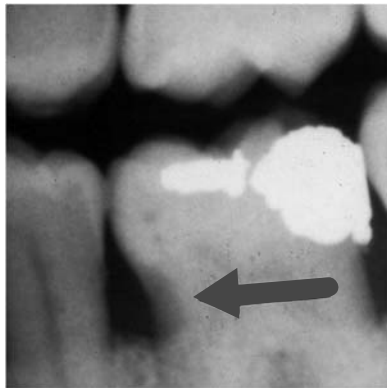
Root caries may be confused with cervical burnout (see below).

Cervical Burnout



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IV. Root caries



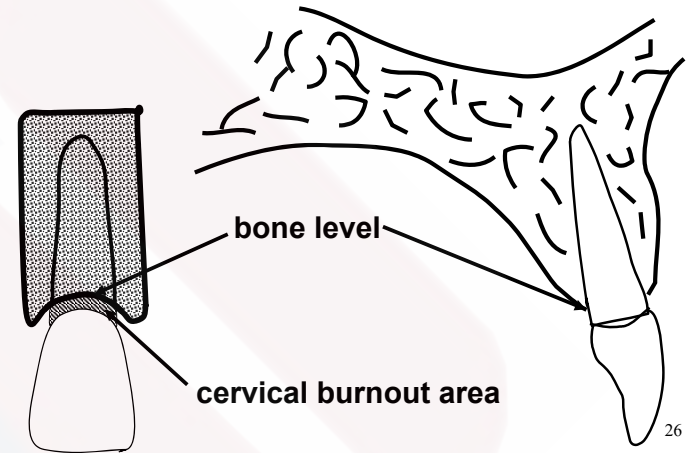
Cervical burnout



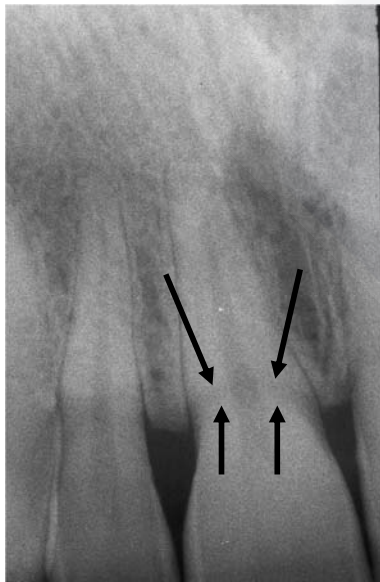
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IV. Root caries

Anterior Cervical Burnout



IV. Root caries



Cervical burnout in the anterior region due to gap between enamel and alveolar bone over root.

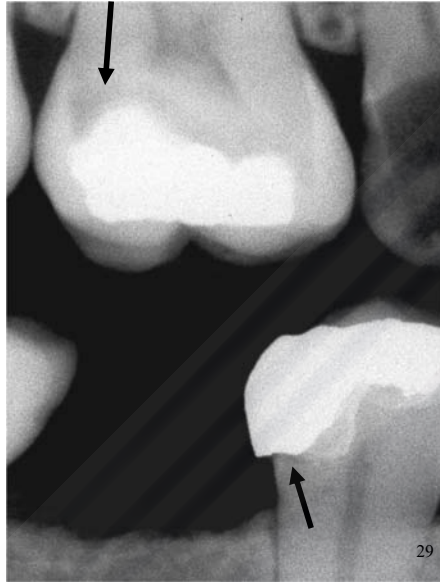
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Recurrent Caries

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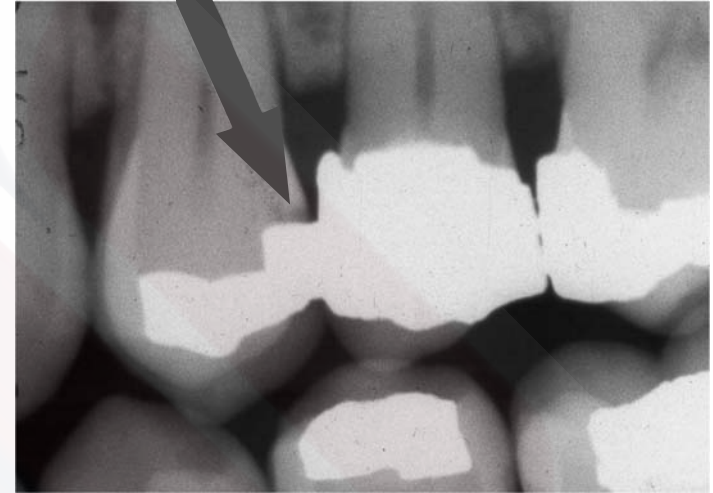
V. Recurrent caries

Recurrent caries



V. Recurrent caries

Recurrent caries



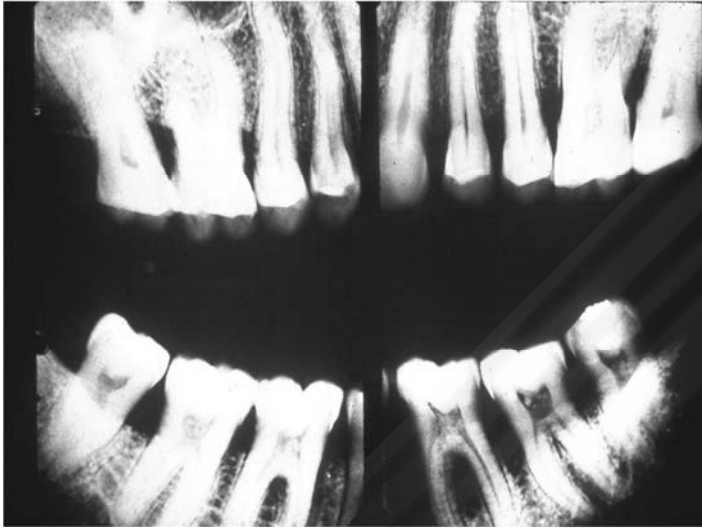
VI. Radiation Caries

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VI. Radiation caries



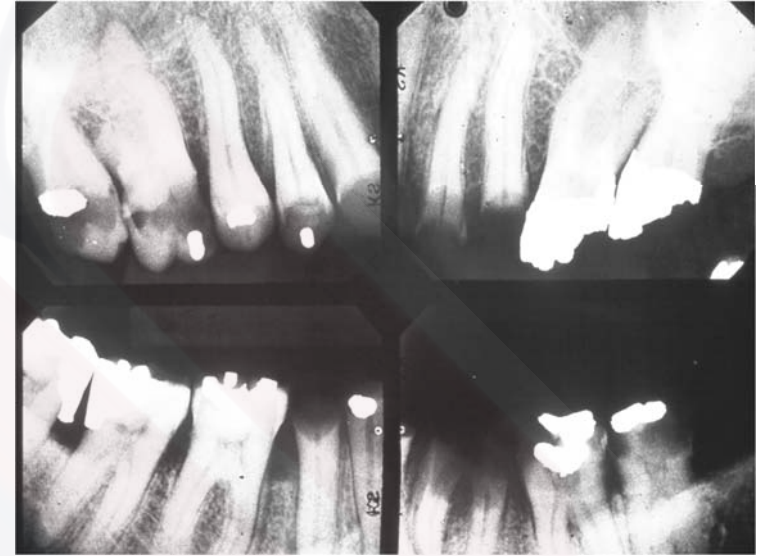
VI. Radiation caries



Before radiation

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VI. Radiation caries



1 year after radiation

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Periodontal Disease

- Bitewings best for diagnosis.
- Some feel that paralleling PA's are best.
- Higher kVp recommended (long scale, low contrast).

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Periodontal Disease

- Compare images from different visits (using same technique).
- May be classified into gingival diseases and periodontal disease.

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Limitation of Radiographs

- Two-dimensional film with overlapping bony walls, superimposed roots
- Clinical diagnosis is the main.
- Soft tissue alterations (bleeding, inflammation, etc) cannot be detected on radiographs.

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Periodontitis

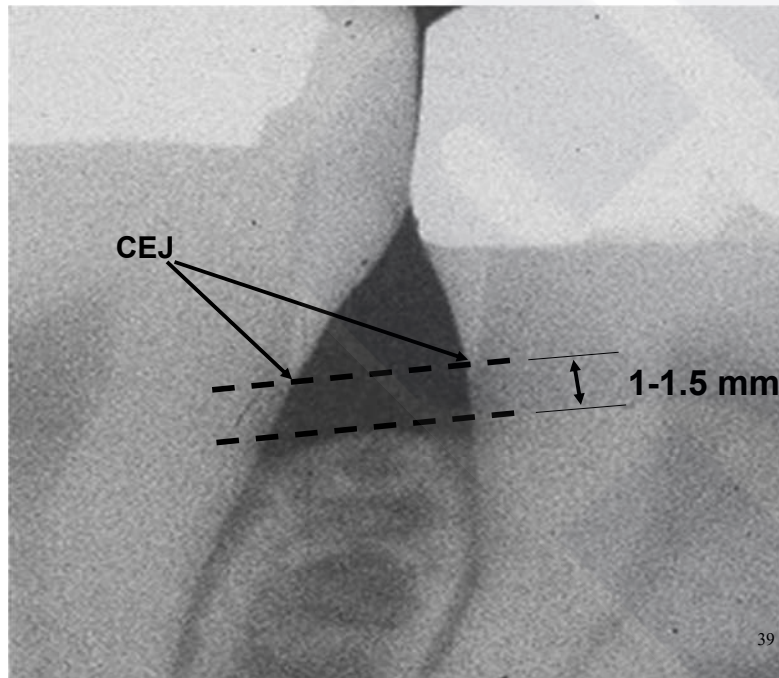
Normal Anatomy:

Alveolar crest corticated

1-1.5 mm from crest to CEJ

Crest is pointed anteriorly

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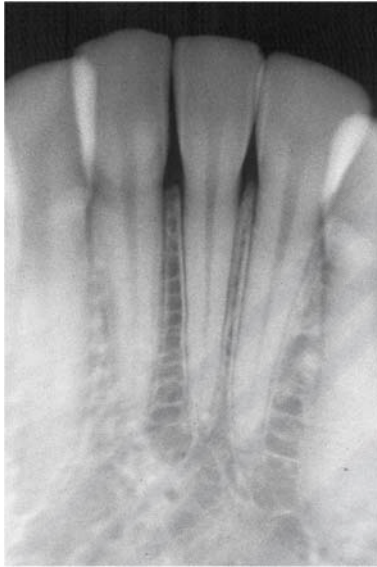
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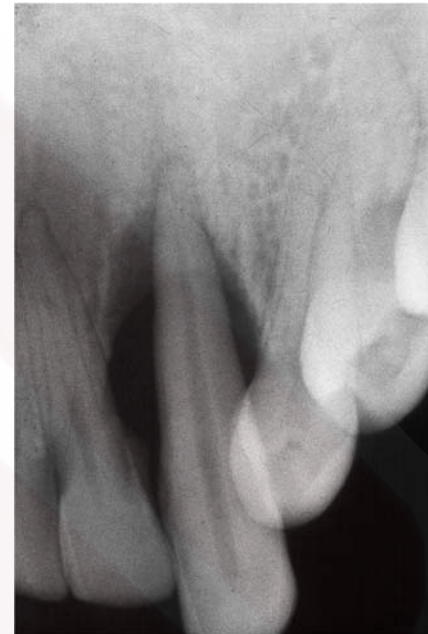
Corticated alveolar crests

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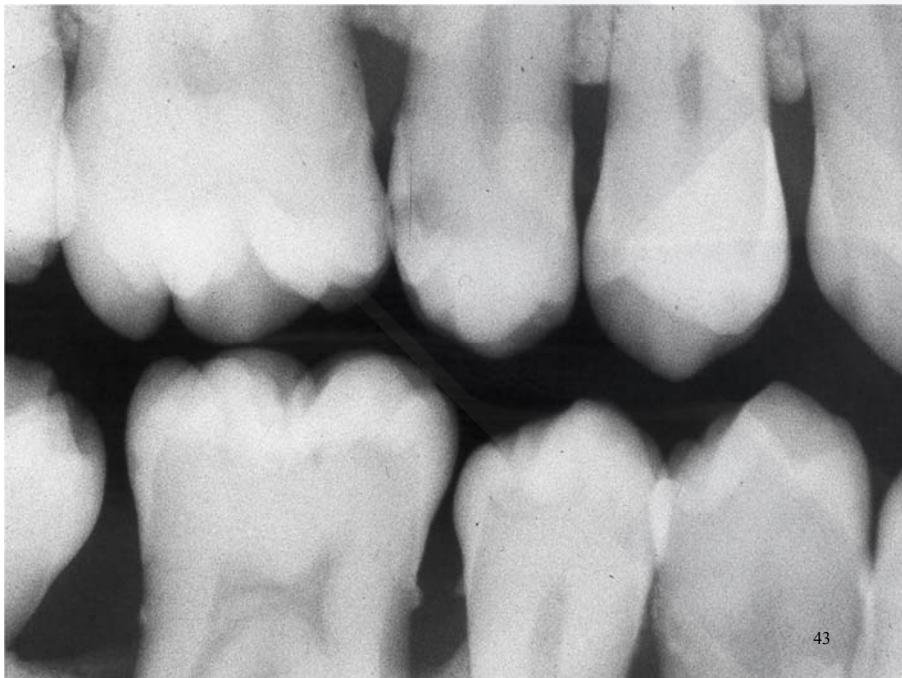
Alveolar crests more pointed anteriorly



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Types of bone loss

Horizontal bone loss: Parallel to line drawn between adjacent CEJ's

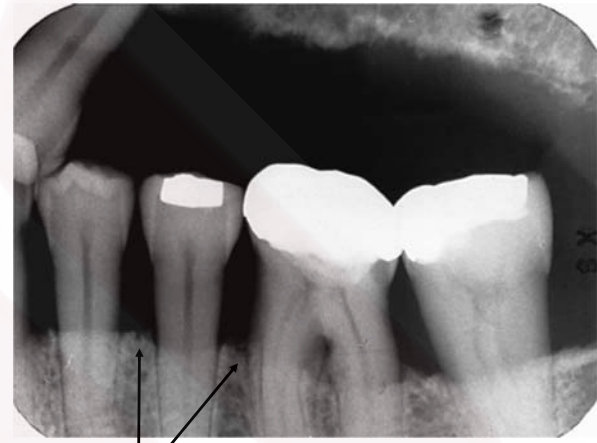
Vertical (Angular) bone loss: More bone destruction on interproximal aspect of one tooth than on the adjacent tooth

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Vertical bone loss

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Horizontal bone loss

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Gingivitis

No bone loss

No radiographic signs

The end

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