WINSPERT

RADIOLOGY

ANATOMICAL LANDMARKS ON RADIOGRAPHS

MIND MAP & CUE CARDS

BY DR. JIGYASA SHARMA

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MIND MAP

ANATOMICAL LANDMARKS ON RADIOGRAPHS

Enamel-Dentin Junction and Cementum Visibility

- The junction between enamel and dentin is distinct and visible on radiographs.
- Cementum layer is thin with low contrast and usually not visible radiographically.

Supporting Structures: Lamina Dura

- Lamina dura is a thin, radiopaque bone layer lining the tooth socket, continuous with alveolar cortical bone.
- Its appearance varies with x-ray angle; intact lamina dura suggests a vital pulp.

Periodontal Ligament Space (PDL)

- PDL appears as a radiolucent space between the tooth root and lamina dura.
- Its width varies among individuals, teeth, and locations around a tooth.

Anterior Nasal Spine and Nasal Aperture

- Anterior nasal spine is V-shaped and radiopaque near the maxillary central incisors.
- Nasal aperture is air-filled and appears as a radiopaque line extending bilaterall from the anterior nasal spine.

Nasal Soft Tissue and Maxillary Sinus

- Soft tissue of the nose appears as a uniform, slightly opaque shadow over maxillary incisors.
- Maxillary sinus is a large air cavity with thin radiopaque borders; its floor may vary in position relative to posterior teeth.

Pterygoid Plates and Hamular Process

- Medial and lateral pterygoid plates lie behind the maxillary tuberosity; often seen as a single radiopaque shadow.
- The hamular process extends inferiorly from the medial pterygoid plate and may show trabeculation on close inspection.

Teeth Composition and Radiographic Appearance

- Teeth mainly consist of dentin with an enamel cap and a thin cementum layer.
- Enamel appears most radiopaque due to its high density; dentin is homogeneous and smooth on radiographs.

Pulp and Cervical Burnout Phenomenon

- Pulp is soft tissue and appears radiolucent on radiographs.
- Cervical burnout shows as difuse radiolucent areas near the cervical regions caused by normal tooth shape, not pathology.

Alveolar Crest Characteristics

- Alveolar crest shows as a radiopaque line between teeth, normally within 1.5 mm of the cementoenamel junction.
- It may recede with age or periodontal disease.

Maxillary Anatomical Variants: Intermaxillary Suture

- Intermaxillary suture appears as a thin radiolucent line at the midline of the premaxilla.
- It may end near the alveolar crest in a small rounded or V-shaped enlargement.

Incisive Foramen and Lateral Fossa

- Incisive foramen is a midline opening behind central incisors, transmitting nerves and vessels; important in diagnosing cysts.
- Lateral fossa is a radiolucent depression near the lateral incisor apex, distinguishable from pathology by intact lamina dura.

Zygomatic Process and Zygomatic Bone

- Zygomatic process of maxilla appears as a U-shaped radiopaque line near the first and second molars.
- The zygomatic bone extends posteriorly, visible as uniform radiopacity over molar apices.

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MIND MAP

RADIOGRAPHIC ANATOMY AND RESTORATIVE MATERIALS OF THE MANDIBLE

Genial Tubercles

- Located on lingual surface above the inferior border in the midline
- Appear as small radiopaque projections on occlusal radiographs; variable on periapical films

Mental Fossa

- Depression on labial surface above mental ridge, lateral from midline
- May mimic submandibular fossa or periapical pathology due to thin bone

Mandibular Canal

- Dark linear shadow bordered by thin radiopaque bone lamellae
- Width varies between patients but fairly constant anterior to third molars

Submandibular Gland Fossa

- A bony concavity below mylohyoid ridge in molar region
- Appears as radiolucent area with sparse trabecular pattern

Inferior Border of Mandible

- Dense, broad radiopaque band sometimes visible on periapical projections

Radiographic Appearance of Restorative Materials

- Silver amalgam and gold: completely radiopaque
- Stainless steel pins and crowns: radiopaque
- Calcium hydroxide bases and gutta-percha: mostly radiopaque
- Composite materials: variable, from radiolucent to radiopaque depending on type
- Older materials like silicates: usually radiolucent; stainless steel orthodontic appliances: radiopaque

Mandibular Symphysis

- Radiolucent midline suture seen in infants between central incisors
- Usually fuses by the end of the first year, then disappears radiographically

Lingual Foramen

- Small round radiolucent canal with opaque border on the lingual midline
- Located below the apices of mandibular incisors

Mental Foramen

- Usually marks anterior end of inferior dental canal on periapical films
- Variable visibility; can mimic periapical lesions especially when overlapping premolar roots

Mylohyoid Ridge

- Irregular bony crest on lingual mandibular body from third molars to chin
- Radiographically runs diagonally downward-forward near posterior tooth apices

External Oblique Ridge

- Continuation of anterior mandibular ramus border
- Radiopaque line blending into alveolar bone shadow anteriorly

Coronoid Process

- Triangular radiopacity seen on maxillary molar periapicals
- Apex directed superiorly and anteriorly, superimposed over third molar region

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ANATOMICAL LANDMARKS ON RADIOGRAPHS

Question 1

What are the primary components of teeth and how do they appear on radiographs?

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ANATOMICAL LANDMARKS ON RADIOGRAPHS

Answer 1

Teeth are primarily composed of dentin, with an enamel cap over the crown and a thin layer of cementum over the root. Enamel appears the most radiopaque due to its high density, dentin appears smooth and homogeneous, and cementum is usually not visible because it is thin and similar in density to dentin.

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ANATOMICAL LANDMARKS ON RADIOGRAPHS

Question 2

What is cervical burnout in dental radiographs and how can it be identified?

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Answer 2

Cervical burnout is a diffuse radiolucent area with ill-defined borders near the cervical region of teeth, caused by decreased x-ray absorption due to the tooth's normal shape. It appears between the enamel edge and the alveolar crest and can be identified by intact edges of proximal surfaces and its common presence on almost all teeth.

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Question 3

Describe the lamina dura and its significance on dental radiographs.

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Answer 3

The lamina dura is a thin radiopaque layer of dense bone lining the tooth socket, continuous with cortical bone at the alveolar crest. Its presence, especially around the tooth apex, suggests a healthy, vital pulp. Its appearance varies depending on x-ray beam angle and occlusal forces.

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Question 4

What is the normal position of the alveolar crest relative to the cementoenamel junction?

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Answer 4

The alveolar crest is considered normal when it is no more than 1.5 mm apical to the cementoenamel junction of adjacent teeth. It appears as a radiopaque line on radiographs and may recede with age or periodontal disease.

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ANATOMICAL LANDMARKS ON RADIOGRAPHS

Question 5

How does the periodontal ligament (PDL) space appear on radiographs and what factors influence its width?

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Answer 5

The PDL space appears as a radiolucent gap between the tooth root and lamina dura. Its width varies between patients, between different teeth in the same patient, and around different parts of a single tooth.

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Question 6

What is the intermaxillary suture and how does it appear on maxillary radiographs?

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Answer 6

The intermaxillary suture is the median suture between the two halves of the premaxilla. On radiographs, it appears as a thin radiolucent line in the midline and may end near the alveolar crest with a small rounded or V-shaped enlargement.

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Question 7

Where is the incisive foramen located and why is it clinically important?

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Answer 7

The incisive foramen is located in the midline of the palate behind the maxillary central incisors at the junction of the median palatine and incisive sutures. It transmits nasopalatine vessels and nerves and is important because it can be a site for cyst formation, which appears as enlargement on radiographs.

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Question 8

What radiographic features characterize the maxillary sinus and its relation to adjacent teeth?

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Answer 8

The maxillary sinus appears on radiographs as a thin radiopaque line representing its cortical borders. Its floor may extend variably, sometimes overlapping the apices of posterior teeth, and the sinus is pyramid-shaped with walls adjacent to the orbit, premolars, molars, and maxillary tuberosity.

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Question 9

Describe the mental foramen and how it can be differentiated from periapical pathology on radiographs.

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Answer 9

The mental foramen is an opening on the anterior border of the mandibular canal, often seen near premolar apices as a radiolucent area. It can mimic periapical pathology but is differentiated by the continuity of the inferior dental canal and sometimes the presence of lamina dura; additional radiographs from different angles help confirm its identity.

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Question 10

What are the typical radiographic appearances of common restorative materials?

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Answer 10

Silver amalgam and gold restorations are completely radiopaque. Stainless steel pins and crowns are radiopaque. Calcium hydroxide bases may be radiolucent or radiopaque. Gutta-percha is radiopaque. Composite materials vary from radiolucent to radiopaque depending on type. Silicates are usually radiolucent.

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OPG ERRORS

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MIND MAP

OPG ERRORS AND PANORAMIC TECHNIQUE ERRORS

Effects of Incorrect Anterior Positioning

- Less horizontal magnification due to closeness to the film.
- Blurred images because teeth are out of the focal trough.

Head Not Centered (Head Turned)

- Structures closer to the film appear smaller; those farther appear larger.
- Unequal magnification causes distortion on one side of the image.

Head Tipped Up (Chin Up)

- Squared-off mandible with hard palate superimposed over maxillary roots.
- "Reverse smile" occlusal plane and loss of sharpness in maxillary incisors.

Vertical (Spinal) Shadow Errors

- Patient slouching causes vertebral column shadow in center of film.
- Radiopaque area extends through middle, potentially obscuring structures.

Lip Space Error

- Failure to close lips on bite block results in radiolucent shadow masking anterior crowns.
- Ghost images like earrings appear larger and on opposite side of actual object.

Patient Positioning Errors in OPG

- Teeth too anterior: Patient positioned too far forward, causing narrower and blurred anterior teeth.
- Teeth too posterior: Patient positioned too far back, causing wider and blurred anterior teeth.

Effects of Incorrect Posterior Positioning

- Increased horizontal magnification due to distance from the film.
- Blurred images because teeth are outside the focal trough.

Head Tipped Down (Chin Down)

- V-shaped mandible and shortened mandibular incisor roots.
- "Smiling" occlusal plane and fuzzy apices of mandibular incisors.

Lead Apron Shadow Errors

- Lead apron placed too high blocks the x-ray beam.
- Results in radiopaque shadows obscuring mandibular anatomy.

Palatoglossal Air Space Error

- Failure to keep tongue against palate creates radiolucent band above maxillary roots.
- This air space can mask periapical radiolucencies.

Summary of Common OPG Errors

- Positioning errors cause distortion and blurring.
- Improper use of lead apron causes radiopaque shadows.
- Air spaces from tongue or lips create radiolucent bands masking details.
- Head alignment critical for accurate panoramic radiographs.

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MIND MAP

PANORAMIC TECHNIQUE ERRORS IN OPG

Failure to Remove Metallic Objects

- Metallic appliances should be removed during patient preparation to avoid image obstruction.
- Metallic partial dentures obscure diagnostic areas and may create ghost images (e.g., hearing aids causing overlapping shadows)

Failure to Remove Glasses

- Glasses should be removed to prevent obscuring the maxillary anterior teeth area.
- Improper positioning (e.g., chin tipped up) combined with glasses can cause distorted panoramic images (e.g., squared mandible, reverse "smile").

Patient Movement

- Patients must remain still to avoid image distortion during panoramic exposure.
- Excessive movement causes blurred images; slight movement may mimic fractures due to uneven mandible borders.

Reversed Cassette Errors

- Reversing the cassette exposes the wrong film side, producing blurry or incomplete images.
- Effects include lack of contrast, light leaks causing fogging, and overall poor image quality.

Double Exposure

- Using previously exposed cassettes causes double exposure, resulting in overlapping images.
- Films should be processed immediately to avoid reuse errors and static electricity artifacts.

Ghost Images

- Ghost images resemble real images but are projected on the opposite side of the film and appear higher.
- Ghost images are larger, blurred, and have the same shape and orientation as the real object, caused by x-ray beam passing around dense objects like jewelry.

Failure to Remove Acrylic Complete Denture

- Acrylic dentures are usually not dense enough to block bone images but should ideally be removed before exposure.
- Images show acrylic dentures remaining in place, which can affect image clarity

Failure to Remove Tongue Rings

- Tongue rings block teeth in panoramic x-rays and should be removed.
- Tongue rings do not affect properly positioned periapical radiographs as they remain behind the film.

Static Electricity Image Errors

- Static electricity causes black lines or dots with a tree branch pattern on the film.
- It results from quickly removing film from the box or cassette, creating static discharge.

Incorrect Exposure Settings

- Underexposure (too light) or overexposure (too dark) arises from incorrect kVpor mA settings.
- Proper exposure is critical for clear, diagnostic images.

Summary of Positioning Errors

- Common errors include ghost images, failure to remove objects, patient movement, static, reversed cassette, exposure errors, and double exposure.
- Reference: Positioning errors and quality assessment in panoramic radiography
- (https://pmc.ncbi.nlm.nih.gov/articles/PMC3534173/)

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OPG ERRORS

Question 1

What happens to anterior teeth appearance if the patient is positioned too far forward in an OPG?

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Answer 1

If the patient is too far forward (anterior to the focal trough), the anterior teeth will appear narrower and blurred because they are closer to the film, causing less horizontal magnification and reduced sharpness.

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OPG ERRORS

Question 2

How does patient positioning too far back affect the panoramic radiograph?

Answer 2

If the patient is too far back (posterior to the focal trough), the anterior teeth appear wider and blurred due to being farther from the film, which causes more horizontal magnification and decreased image sharpness.

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OPG ERRORS

Question 3

What is the effect on OPG images if the patient’s head is turned to one side during exposure?

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OPG ERRORS

Answer 3

When the head is turned, the teeth closer to the film appear smaller due to less magnification, while the teeth farther from the film appear wider because of increased horizontal magnification.

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OPG ERRORS

Question 4

Describe the radiographic changes when the patient’s chin is tipped down excessively.

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OPG ERRORS

Answer 4

Excessive chin down positioning causes a V-shaped mandible and shortening of the mandibular incisor roots; the occlusal plane appears “smiling,” and the apices of mandibular incisors become fuzzy.

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OPG ERRORS

Question 5

What are the radiographic consequences of tipping the patient’s head up too much during OPG exposure?

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OPG ERRORS

Answer 5

Chin tipped up too much results in a squared-off mandible, superimposition of the hard palate over maxillary roots, a "reverse smile" occlusal plane, and loss of sharpness in maxillary incisor images.

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OPG ERRORS

Question 6

Why should the lead apron be placed low on the patient’s neck during panoramic radiographs?

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OPG ERRORS

Answer 6

The lead apron should be placed low on the neck to avoid blocking the x-ray beam; if placed too high, it causes a radiopaque shadow on the film that obscures a portion of the mandible with no visible teeth or bone.

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OPG ERRORS

Question 7

What causes the palatoglossal air space in a panoramic radiograph and how can it be prevented?

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OPG ERRORS

Answer 7

The palatoglossal air space is caused by failure to keep the tongue against the palate during exposure, resulting in a radiolucent band above maxillary roots. It can be prevented by asking the patient to swallow and maintain tongue contact with the palate throughout the exposure.

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OPG ERRORS

Question 8

What kind of image artifact is created by ghost images in panoramic radiography?

Answer 8

Ghost images are blurred, larger, and projected higher on the opposite side of the film from the real object (such as jewelry), having the same shape and orientation as the real image but appearing as a secondary artifact.

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Question 9

What are the effects of patient movement during panoramic radiography?

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OPG ERRORS

Answer 9

Patient movement causes image blurring and distortion; excessive movement requires retaking the film, while slight movement can create uneven mandibular borders that may mimic fractures.

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Question 10

What problems can arise from using a reversed cassette in panoramic radiography?

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Answer 10

A reversed cassette can produce blurry or incomplete images, lack of contrast, light leaks causing film fogging, and overall poor image quality due to exposure of the wrong side of the film.

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BITEWING AND IOPA ERRORS

MIND MAP & CUE CARDS

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MIND MAP

IOPA AND BITEWING ERRORS IN INTRAORAL RADIOGRAPHY

Intraoral Radiographic Image Acquisition

- Intraoral images use digital receptors or traditional radiographic film.
- Digital receptors include rigid sensors (sizes 0, 1, 2) and phosphor plates (sizes 0 to 4).

Infection Control for Digital Receptors

- Digital receptors cannot be sterilized; proper barrier techniques are essential.
- Barriers must be removed carefully after the radiographic procedure.

Patient Preparation and Consent

- Patients must be informed about the procedure.
- Obtain patient consent prior to taking radiographs.

Technique & Projection Errors: Patient Preparation

- Radiopaque artifacts caused by dental appliances, jewelry, or glasses.
- Remove all such items before imaging to avoid artifacts.

Gag Reflex and Patient Comfort

- Gag reflex triggered by receptor placement in soft palate or pharynx area.
- Start imaging in anterior region to reduce gagging; encourage patient to swallow before receptor placement.

Reversed Film and Dot Artifacts

- Reversed films show herringbone pattern due to film exposed from wrong side.
- Dot artifacts appear as circular radiolucencies; dot should face occlusal surface.

Bending, Creasing, and Damage to Receptors

- Bending or creasing damages the receptor emulsion and compromises image quality.
- Ensure receptor fits properly and avoid flexing.

Horizontal Alignment Errors

- Incorrect horizontal angulation causes overlapping of proximal contacts.
- X-ray beam should be directed between contact points for clear interproximal images.

Summary of Technical Errors

- Errors mainly arise from patient

Common Intraoral Radiographic Techniques.

- Bisecting angle technique: still used in certain cases.
- Paralleling technique: preferred method for intraoral radiography.

Categories of Radiographic Errors

- Technique & Projection errors
- Exposure errors
- Processing errors

Image Blurring Causes and Corrections

- Movement of patient, film, or X-ray tube causes blurred images.
- Instruct patients to remain still; ensure comfortable receptor placement.

Film and Receptor Placement Errors

- Apices cut-off due to insufficient vertical angulation or poor film positioning.
- Tilted occlusal plane appears if receptor is not perpendicular to teeth.

Double Exposure and Dropped Film Corners

- Double exposure occurs if the film is exposed twice; keep films separated.
- Dropped film corners cause part of image to be missing or distorted.

Vertical Alignment Errors

- Elongation caused by under-angulation of the x-ray beam.
- Foreshortening caused by over-angulation of the x-ray beam.
- Adjust vertical angulation accordingly based on arch and technique.

Beam Centering and Cone-cut Errors

- Cone-cuts occur when central ray is not aligned with receptor center.
- Cone-cut appears as clear or white zone depending on receptor type.
- Re-center the beam and check receptor holder assembly to avoid cone-cuts.

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MIND MAP

EXPOSURE ARTIFACTS IN FILM RADIOGRAPHY

Double Exposure
- Film used twice, producing overlapping images
- Avoid by careful film handling and exposure procedure

Underexposure
- Image too light or low density
- Causes: short exposure time, increased source-object distance, low Kvp/mA
- Correction: verify exposure time, Kvp, mA settings before exposure

Processing Artifacts - Time and Temperature Errors
- Underdeveloped film: light image due to inadequate developing time or low temperature
- Overdeveloped film: dark image from excessive developing time or high temperature

Chemical Contamination Errors
- Developer spots: dark spots from developer contacting film before processing
- Fixer spots: white spots from fixer contamination before processing
- Correction: maintain clean work area; use paper towels before unwrapping films

Film Fog
- Dull gray, low contrast image
- Causes: outdated film, improper storage, stray radiation, poor safelight, temperature issues
- Correction: check safelight filters and bulbs; store films properly.

Developer and Fixer Cut Off
- Developer cut off: white straight border due to low developer level
- Fixer cut off: black straight border due to low fixer level
- Correction: ensure solutions cover entire film during processing

Preventive Measures
- Regular equipment checks and calibrations
- Proper darkroom maintenance and lighting
- Careful film handling and processing protocols
- Correct exposure settings tailored to patient and equipment.

Blank Image
- Film receives no radiation, appears clear
- Causes: X-ray machine off, misaligned PID, timer not pressed

Film Exposed to Light
- Film appears black due to exposure to white light
- Correction: unwrap films only under safe lighting; check darkroom leaks

Overexposure
- Image too dark or high density.
- Causes: excessive exposure time, high Kvp/mA, incorrect patient size assessment.
- Correction: check exposure factors; digital images can sometimes be corrected by software.

Reticulation of Emulsion
- Film appears cracked due to sudden temperature changes between developer and water bath
- Avoid drastic temperature differences during processing

Film Handling Errors
- Fingerprint artifacts: black marks from contaminated fingers
- Fingernail marks: black crescent marks from rough film handling
- Bend marks: thin black lines from creasing film
- Static electricity: black branching lines from rapid packet opening or low humidity.
- Correction: handle by edges only, wash hands, open packets slowly, touch conductive objects first.

Air Bubbles
- White spots due to trapped air on film surface during processing
- Correction: gently agitate film racks after immersion

Summary of Film Density Errors
- Film too dark: overexposure, overdevelopment, fogging, faulty equipment or processing
- Film too pale: underexposure, incorrect timer use, faulty equipment

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BITEWING AND IOPA ERRORS

Question 1

What are the two main types of intraoral radiographic receptors?

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Answer 1

The two main types of intraoral radiographic receptors are digital receptors and radiographic film.

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Question 2

What sizes are rigid digital receptors typically available in?

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Answer 2

Rigid digital receptors are typically available in sizes 0, 1, and 2.

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Question 3

Why can digital receptors not be sterilized, and what must be done because of this?

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Answer 3

Digital receptors cannot be sterilized because of their material composition; therefore, proper infection control techniques must be used, including preparing and covering the receptors with barriers and removing them effectively after use.

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BITEWING AND IOPA ERRORS

Question 4

Which two intraoral radiographic techniques are most commonly used?

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Answer 4

The two most commonly used techniques are the bisecting angle technique and the paralleling technique.

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Question 5

Which intraoral radiographic technique is considered the method of choice?

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Answer 5

The paralleling technique is the method of choice for intraoral radiography.

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BITEWING AND IOPA ERRORS

Question 6

What are the three main categories of errors in intraoral radiography?

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BITEWING AND IOPA ERRORS

Answer 6

The three main categories of errors are technique and projection errors, exposure errors, and processing errors.

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BITEWING AND IOPA ERRORS

Question 7

What causes radiopaque artifacts on intraoral radiographs, and how can they be corrected?

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Answer 7

Radiopaque artifacts are caused by dental appliances, jewelry, or eyeglasses left in the mouth during exposure. Correction involves removing all such items before placing the receptor.

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Question 8

What is the most common cause of a blurred image in intraoral radiographs?

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Answer 8

The most common cause of a blurred image is movement of the film, patient, or X-ray tube head during exposure.

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Question 9

How can patient movement during radiographic exposure be minimized?

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Answer 9

Patient movement can be minimized by proper receptor placement, explaining the procedure clearly to the patient, asking them to remain still, and using cushioned receptor edges to reduce discomfort.

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Question 10

What is a common cause of the gag reflex during intraoral radiography, and how can it be managed?

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BITEWING AND IOPA ERRORS

Answer 10

The gag reflex is commonly stimulated when the receptor touches the soft palate, base of the tongue, or posterior pharynx. It can be managed by starting exposures in the anterior region, encouraging the patient to swallow before receptor placement, and being gentle during placement.

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BITEWING AND IOPA ERRORS

Question 11

What is the cause and correction for apices cut off in intraoral radiographs?

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Answer 11

Apices cut off are caused by insufficient vertical angulation or improper film placement that does not cover the apical regions. Correction involves ensuring the film edge extends no more than 1/8 inch beyond the incisal or occlusal surfaces to cover the apices.

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Question 12

What does a reversed film error look like, and what causes it?

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Answer 12

A reversed film error appears as a light image with a herringbone or tire track pattern due to the embossed lead foil backing being exposed to the X-ray beam. It occurs when the film is placed backward in the mouth.

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BITEWING AND IOPA ERRORS

Question 13

How can a dot artifact appear on a radiograph, and what is the correct placement of the dot?

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Answer 13

A dot artifact appears as a circular radiolucent spot on the radiograph. The dot should be placed toward the occlusal portion of the teeth.

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Question 14

What causes elongation in radiographic images, and how can it be corrected?

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Answer 14

Elongation occurs from under-angulation (too little vertical angle) of the X-ray beam. It can be corrected by increasing the vertical angulation: increasing positive angulation for maxillary arch and negative angulation for mandibular arch.

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BITEWING AND IOPA ERRORS

Question 15

What causes foreshortening in radiographic images, and how can it be corrected?

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Answer 15

Foreshortening is caused by over-angulation (too much vertical angle) of the X-ray beam. Correction involves decreasing the positive vertical angulation for maxillary projections and decreasing negative vertical angulation for mandibular projections.

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Question 16

Why is proper horizontal alignment of the X-ray beam important?

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BITEWING AND IOPA ERRORS

Answer 16

Proper horizontal alignment opens interproximal contacts, allowing thorough caries evaluation and assessment of alveolar bone levels by preventing the overlapping of proximal contacts.

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BITEWING AND IOPA ERRORS

Question 17

What causes a cone-cut error, and how does it appear on traditional and digital radiographs?

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BITEWING AND IOPA ERRORS

Answer 17

A cone-cut error is caused by misalignment of the central X-ray beam with the receptor, resulting in a clear zone on traditional radiographs or an opaque white zone on digital images where the beam did not expose the receptor.

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CUE CARDS

BITEWING AND IOPA ERRORS

Question 18

What are the common causes of an underexposed radiographic image?

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CUE CARDS

BITEWING AND IOPA ERRORS

Answer 18

Underexposure can be caused by inadequate exposure time, low kVp or mA settings, increased source-to-object distance, or the operator releasing the exposure button too soon.

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CUE CARDS

BITEWING AND IOPA ERRORS

Question 19

What are the signs and causes of a film exposed to light, and how can this be prevented?

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BITEWING AND IOPA ERRORS

Answer 19

A film exposed to light appears black due to accidental exposure to white light. Prevention includes unwrapping films only under safe light conditions and checking the darkroom for light leaks.

WINSPERT

RADIOLOGY

JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

MIND MAP & CUE CARDS

BY DR. JIGYASA SHARMA

WINSPERT

MIND MAP

JAW CYSTS, TUMORS, RADIOLUCENT LESIONS (RADIOLOGY)

Pericoronitis (Operculitis)

- Inflammation around the crown of a partially erupted tooth, usually mandibular third molars
- Radiologic signs vary from no change to localized rarefaction, sclerosis, or osteomyelitis

Radicular Cysts

- Located at apex of nonvital tooth or accessory canals
- Well-defined cortical borders, mostly radiolucent; may have calcifications or cause root resorption

Odontogenic Keratocyst (KOT)

- Mostly in posterior mandible and ramus, superior to inferior alveolar nerve canal
- Radiolucent with cortical borders, minimal jaw expansion, sometimes multilocular with internal septa

Calcifying Cystic Odontogenic Tumor (CCOT)

- Occurs mostly anterior to first molar, associated with cuspids and incisors
- Radiolucent with variable calcifications; may cause tooth displacement, root resorption, and cortical perforation

Simple Bone Cyst (SBC)

- Mostly in mandible, especially ramus and posterior body; rare in maxilla
- Radiolucent with smooth, scalloped borders often between roots; may appear multilocular without true septa

Inflammatory Lesions of Jaw

- Inflammatory lesions are the most common jaw pathology
- Often caused by infection or food debris trapping near partially erupted teeth

Osteomyelitis

- Bone inflammation spreading through marrow, cortex, and periosteum
- Early radiographic signs: decreased bone density and trabecular loss, progressing to radiolucency and sclerosis

Dentigerous Cyst

- Epicenter above crown of impacted tooth, commonly mandibular/maxillary third molars or canines
- Well-defined circular cortex attached at cementoenamel junction, radiolucent internally except tooth crown

Lateral Periodontal Cyst

- Typically in mandible between lateral incisor and second premolar
- Well-defined, round or oval radiolucency with cortical borders; botryoid variant may be multilocular

Nasopalatine Duct Cyst

- Located in nasopalatine canal, sometimes extends to hard palate or anterior maxilla
- Well-defined, corticated, circular or oval radiolucency; may show rare internal calcifications and heart-shaped shadow

Summary of Radiologic Features

- Most lesions present as radiolucencies with well-defined cortical borders
- Infection can alter borders, cause sclerosis or rarefaction, and induce bone expansion or resorption
- Location, shape, and internal structure aid diferential diagnosis among cysts and tumors

Map Your Way to ADC Success!

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MIND MAP

TUMORS OF JAW

Ameloblastoma Borders and Definition

- Usually well defined with a cortical border, often curved
- Small lesions may resemble cysts with indistinguishable borders
- Maxillary lesions tend to have more ill-defined peripheries

Ameloblastoma Loculation Patterns

- Larger loculations in posterior mandible
- Smaller loculations in anterior mandible
- Desmoplastic variety shows irregular sclerotic bone resembling bone dysplasia or bone-forming tumor

Imaging Features of Ameloblastoma

- Multilocular lesions with straight or coarse curved septa
- Large lesions often found in mandibular body and ramus

CEOT Internal Features

- May appear unilocular or multilocular
- Contains numerous scattered radiopaque foci near crown of embedded tooth-key diagnostic feature

Benign Cementoblastoma Overview

- More common in mandible (78%), mainly on premolars or first molars (90%)
- Well-defined radiopacity with cortical border and internal radiolucent band

Ameloblastoma Location and Origin

- Most (80%) develop in the molar ramus region of the mandible
- Can also occur in maxilla, mainly third molar area extending to maxillary sinus and nasal floor
- Tumor may originate near a developing tooth in either jaw

Ameloblastoma Internal Structure

- Ranges from totally radiolucent to mixed radiolucent-radiopaque
- Presence of bony septa forming internal compartments
- Septa often remodeled into honeycomb (small locules) or soap bubble (larger locules) patterns

Ameloblastoma Effects on Teeth

- Pronounced root resorption tendency
- Common tooth displacement

Calcifying Epithelial Odontogenic Tumor (CEOT) Characteristic

- Also called Pindborg tumor, similar predilection for mandible in premolar-molar area.
- Often associated with unerupted or impacted teeth
- Borders may be well defined or irregular and ill defined

CEOT Effects on Teeth

- May displace developing tooth or prevent eruption

Benign Cementoblastoma Internal Structure

- Mixed radiolucent-radiopaque lesion, predominantly radiopaque
- Pattern may be amorphous or show characteristic wheel spoke appearance

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CUE CARDS

JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 1

What is pericoronitis and which tooth is it most commonly associated with?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 1

Pericoronitis is inflammation of the tissues surrounding the crown of a partially erupted tooth. It is most commonly associated with the mandibular third molars in young adults.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 2

What radiologic signs can be observed in pericoronitis when bone changes are present?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 2

When bone changes occur in pericoronitis, they are centered on the follicular space or the portion of the crown still embedded in or near bone. The lesion's periphery is ill-defined with a gradual transition into a sclerotic region, and the adjacent bone shows sclerosis with thick trabeculae. Radiolucency enlarging the follicular space may also be seen.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 3

What are the first radiographic signs of acute osteomyelitis in the jaw?

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Answer 3

The first radiographic evidence of acute osteomyelitis is a slight decrease in bone density with a loss of sharpness in the existing trabeculae.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 4

How can sequestra be identified radiographically in chronic osteomyelitis?

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Answer 4

Sequestra appear as islands of nonvital bone within areas of radiolucency. They vary in size from small dots (more common in young patients) to larger segments of radiopaque bone.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 5

Where is the epicenter of a radicular cyst typically located?

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Answer 5

The epicenter of a radicular cyst is usually located at the apex of a nonvital tooth. Occasionally, it may be found at the mesial or distal root surface, accessory canal openings, or deep periodontal pockets.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 6

What distinguishes a dentigerous cyst radiographically and where is it most commonly found?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 6

A dentigerous cyst typically has a well-defined cortex with a curved or circular outline and attaches at the cementoenamel junction above the crown of an involved tooth. It is most commonly found around mandibular or maxillary third molars and maxillary canines.

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CUE CARDS

JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 7

What is a keratocystic odontogenic tumor (KOT) and what is its common location?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 7

A keratocystic odontogenic tumor (KOT) is a cystic lesion commonly found in the posterior body and ramus of the mandible, usually superior to the inferior alveolar nerve canal. It often shows a radiolucent internal structure and may have curved internal septa, giving it a multilocular appearance.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 8

Where do lateral periodontal cysts most frequently develop and how do they appear radiographically?

JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 8

Lateral periodontal cysts most frequently develop in the mandible, from the lateral incisor to the second premolar region. Radiographically, they appear as well-defined, round or oval radiolucencies with a prominent cortical boundary.

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CUE CARDS

JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 9

What are the typical features of a calcifying cystic odontogenic tumor (CCOT) on radiographs?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 9

CCOTs often occur anterior to the first molar, with a periphery that can be well-defined or ill-defined. Internally, they may appear completely radiolucent or contain small calcified flecks or larger amorphous masses. They can be associated with tooth displacement, root resorption, and cortical plate perforation.

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Question 10

What radiographic patterns are characteristic of ameloblastomas in the jaw?

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JAW CYSTS, TUMORS, RADIOLUCENT LESSIONS

Answer 10

Ameloblastomas typically show a well-defined, often curved cortical border with internal compartments created by bony septa. These septa can produce honeycomb (many small loculations) or soap bubble (larger loculations) radiographic patterns. Root resorption and tooth displacement are common.

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RADIOLOGY

DENTAL CARIES RADIOLOGY

MIND MAP & CUE CARDS

BY DR. JIGYASA SHARMA

WINSPERT

MIND MAP

DENTAL CARIES RADIOLOGY

Limitations of Clinical Examination

- Intact tooth surfaces may hide demineralization not visible clinically.
- Radiology uncovers occlusal and proximal lesions that clinical exams may miss.

Proximal Surface Lesions

- Early lesions appear as triangular radiolucencies near the contact point and free gingival margin.
- Lesions spread along the dentino-enamel junction, forming a second triangular shape toward the pulp.

Occlusal Surface Caries

- Common in children and adolescents, starting in enamel pits and fissures.
- Lesions often begin on fissure walls and extend perpendicularly to the dentino-enamel junction.

Buccal and Lingual Surface Lesions

- Usually round when small, becoming elliptical or semilunar as they enlarge.
- Difficult to distinguish buccal from lingual lesions radiographically; clinical evaluation is crucial.

Secondary (Recurrent) Caries

- Caries developing at margins of restorations due to faulty shaping or plaque accumulation.
- Detection requires multiple radiographic angles and careful clinical examination.

Radiation-Induced Caries

- Radiation therapy causes xerostomia and bacterial changes, resulting in aggressive cervical caries.
- Radiographs show characteristic radiolucent shadows around tooth necks, often encircling crowns.

Multifactorial Nature of Dental Caries

- Dental caries results from the interaction of three factors: the tooth, microflora, and diet.
- Radiography complements clinical examinations in detecting caries.

Radiographic Techniques for Detecting Caries

- Bitewing projections are most effective for caries detection..
- Periapical radiographs, especially with paralleling technique, help detect caries in anterior and posterior teeth.

Morphologic Mimics of Caries

- Pits, fissures, cervical burnout, and Mach band effects can resemble carious lesions.
- Thorough clinical correlation is essential to avoid misdiagnosis.

Radiographic Appearance of Occlusal Lesions

- Early lesions show discoloration; deeper lesions appear as broad-based radiolucencies beneath fissures.
- Advanced lesions undermine enamel, leading to cavitation from masticatory forces.

Root Surface Caries

- Involve cementum and dentin, linked with gingival recession.
- Often diagnosed clinically; radiographs help detect proximal root lesions.

Radiographic Challenges with Restorations

- Radiopaque restorations may obscure caries.
- Differentiation between restorative materials and caries depends on shape, borders, and radiopacity.

Radiographic Classification of Caries

- Caries categorized by a 5-level radiolucency system (C1-C5) to standardize assessment.
- Radiographic images help illustrate lesion depth and severity, including root caries.

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DENTAL CARIES
RADIOLOGY

Question 1

What are the three factors involved in the development of dental caries?

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Answer 1

Dental caries is a multifactorial disease involving the interaction between the tooth, the microflora, and the diet.

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Question 2

Why is radiography considered valuable in detecting dental caries?

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Answer 2

Radiography is a valuable supplement to clinical examination because it can reveal demineralizations beneath intact surfaces, especially in occlusal and proximal areas, that may not be visible during a clinical exam.

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Question 3

Which radiographic projection is most useful for detecting dental caries?

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Answer 3

The bitewing projection is the most useful radiologic examination for detecting caries.

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Question 4

What is the classic radiographic appearance of early proximal enamel carious lesions?

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Answer 4

Early proximal enamel carious lesions typically appear as a triangular radiolucency with the broad base at the tooth surface, spreading along the enamel rods.

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Question 5

How do carious lesions progress when they reach the dentino-enamel junction (DEJ)?

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Answer 5

When lesions reach the DEJ, they spread along the junction forming a second triangle with its apex directed toward the pulp, progressing deeper through the dentinal tubules.

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RADIOLOGY

Question 6

Where do occlusal carious lesions commonly start, and how do they appear clinically?

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RADIOLOGY

Answer 6

Occlusal lesions commonly start on the sides of fissure walls rather than the base and appear as chalky white, yellow, brown, or black discolorations of the occlusal fissures.

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Question 7

What challenges exist in radiographically detecting buccal and lingual carious lesions?

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Answer 7

It can be difficult to differentiate buccal from lingual lesions on radiographs, and these lesions often present as round or elliptical radiolucencies with sharp, well-defined borders surrounded by non-carious enamel.

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DENTAL CARIES
RADIOLOGY

Question 8

What characterizes root surface caries, and how are they typically diagnosed?

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RADIOLOGY

Answer 8

Root surface caries involve cementum and dentin, are associated with gingival recession, and are usually diagnosed clinically since radiographs are often not necessary, except in proximal root surfaces.

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DENTAL CARIES
RADIOLOGY

Question 9

What are secondary or recurrent caries, and how can they be detected radiographically?

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DENTAL CARIES
RADIOLOGY

Answer 9

Secondary or recurrent caries develop at the margins of existing restorations, often due to plaque accumulation from faulty restoration shaping. They can be obscured by radiopaque restorations but may be detected using radiographs taken at different angulations.

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RADIOLOGY

Question 10

What are the typical features and radiographic appearance of radiation caries?

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RADIOLOGY

Answer 10

Radiation caries occur after therapeutic head and neck radiation causing xerostomia and changes in tooth structure; they begin at the cervical region and aggressively encircle the tooth. Radiographically, they appear as radiolucent shadows at the necks of teeth, especially on mesial and distal aspects.

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RADIOLOGY

PERIODONTITIS RADIOLOGY

MIND MAP & CUE CARDS

BY DR. JIGYASA SHARMA

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MIND MAP

PERIODONTAL RADIOLOGY

Gingival Diseases

- Gingivitis presents as inflammation with swelling, edema, and erythema of soft tissues around teeth.
- Can be plaque-induced (more common) or non-plaque-induced (viral, fungal, allergic, traumatic).

Role of Radiographs in Periodontal Disease

- Radiographs provide critical information about alveolar bone status and disease progression.
- Serve as a permanent record and help identify bone destruction, contributing factors, and prognosis indicators.

Radiographic Patterns of Bone Loss in Periodontitis

- Early chronic periodontitis shows localized erosion at interproximal alveolar bone crest.
- Bone loss patterns include horizontal, vertical/angular defects, interdental craters, cortical plate loss, and furcation involvement.

Vertical (Angular) Bone Defects.

- Localized vertical bone loss along the root, classified by the number of bony walls remaining (three-, two-, or one-walled defects).
- Important for treatment planning; clinical and surgical inspection necessary for accurate assessment.

Furcation Involvement in Multirooted Teeth

- Periodontal bone loss may extend into furcation areas of multirooted teeth, complicating disease progression and treatment.

Staging and Grading of Periodontitis

- Stage I: Bone loss in coronal third (<50%), vertical/angular bone loss pattern, mild disease.
- Stage II: Bone loss up to mid-third of roots (50%-70%), mixed horizontal and vertical bone loss, may require endodontic therapy.
- Stage III: Extensive bone loss (>70%), mostly horizontal pattern, multiple teeth lost or hopeless, widened periodontal ligament space, and periapical changes.

Overview of Periodontal Diseases

- Periodontal diseases involve inflammatory responses in periodontal tissues leading to soft tissue changes, bone loss, and potentially tooth loss.
- Classified broadly into gingival diseases and periodontitis, with distinct characteristics and progression.

Periodontitis Characteristics

- Distinguished by destruction of soft tissue attachment and supporting bone around teeth.
- Always preceded by gingivitis but not all gingivitis cases progress to periodontitis.

Normal Radiographic Features of Periodontal Tissues

- Alveolar bone crest covered by a thin opaque cortical bone layer indicating healthy periodontium.
- The alveolar crest and lamina dura form a sharp angle near tooth roots in healthy states.

Horizontal Bone Loss

- Loss of alveolar bone height while the crest remains parallel to CEJS of adjacent teeth.
- Bone level is apically positioned several millimeters below the CEJ line.

Interdental Craters and Cortical Plate Loss

- Interdental craters are two-walled, trough-like defects between adjacent teeth visible as radiolucent bands.
- Buccal or lingual cortical plate loss appears as semicircular radiolucencies near the alveolar crest, indicating localized bone loss.

Local Irritating Factors Contributing to Periodontitis

- Calculus deposits promote plaque retention and disease progression, frequently on mandibular incisors.
- Defective restorations with overhanging margins foster plaque accumulation and periodontal inflammation.
- Misaligned teeth with open contacts trap food debris, increasing risk for localized periodontal disease.

Summary

- Radiology is essential for diagnosing, monitoring, and planning treatment in periodontal diseases.
- Understanding bone loss patterns and contributing factors aids in precise staging and prognosis of periodontitis.
- Early detection and management can prevent severe periodontal destruction and tooth loss.

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PERIODONTITIS
RADIOLOGY

Question 1

What are periodontal diseases and what tissues do they affect?

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PERIODONTITIS RADIOLOGY

Answer 1

Periodontal diseases are a set of conditions characterized by an inflammatory host response in the periodontal tissues that may lead to localized or generalized changes in the soft tissues around the teeth, loss of supporting bone, and ultimately, tooth loss.

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PERIODONTITIS
RADIOLOGY

Question 2

How are periodontal diseases broadly classified?

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PERIODONTITIS
RADIOLOGY

Answer 2

Periodontal diseases are broadly classified as gingival diseases and periodontitis.

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Question 3

What distinguishes gingivitis from periodontitis clinically?

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Answer 3

Gingivitis presents as inflammation of soft tissue around the teeth with swelling, edema, and erythema, while periodontitis is distinguished by clinically detectable destruction of host tissues seen as loss of soft tissue attachment and supporting bone.

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Question 4

What role do radiographs play in periodontal disease assessment?

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Answer 4

Radiographs provide unique information about the status of the periodontium, offer a permanent record of bone condition, help identify the extent of alveolar bone destruction, local contributing factors, and features influencing prognosis.

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Question 5

Describe the radiographic appearance of normal alveolar bone.

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Answer 5

Normal alveolar bone shows a thin layer of opaque cortical bone covering the alveolar crest, a well-mineralized cortical outline indicating no periodontitis activity, and a sharp angle where the alveolar crest meets the lamina dura of adjacent teeth.

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PERIODONTITIS
RADIOLOGY

Question 6

What are the general radiographic patterns of bone loss seen in periodontitis?

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RADIOLOGY

Answer 6

Bone loss patterns include horizontal bone loss, vertical (angular) defects, interdental craters, buccal or lingual cortical plate loss, and furcation involvement in multirooted teeth.

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PERIODONTITIS
RADIOLOGY

Question 7

What is horizontal bone loss in periodontal radiographs?

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Answer 7

Horizontal bone loss is the radiographic loss in height of alveolar bone where the crest remains horizontal and parallel to a line joining the cementoenamel junctions (CEJs) of adjacent teeth but is positioned apically more than a few millimeters from the CEJs.

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PERIODONTITIS
RADIOLOGY

Question 8

How are vertical (angular) bone defects described and classified?

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PERIODONTITIS
RADIOLOGY

Answer 8

Vertical osseous defects are localized bony lesions extending apically along the root from the alveolar crest, classified as three-walled, two-walled, or one-walled defects depending on the presence or absence of buccal and lingual cortical plates.

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RADIOLOGY

PERIAPICAL LESIONS

MIND MAP & CUE CARDS

BY DR. JIGYASA SHARMA

WINSPERT

MIND MAP

PERIAPICAL LESIONS

Nomenclature and Classification

- Terms include acute/chronic apical periodontitis, periapical abscess, and periapical granuloma.
- Radiographically, lesions appear as radiolucent (rarefying osteitis) or radiopaque (sclerosing/condensing osteitis).

Histological Characteristics

- Represents apical periodontitis, which may be either a periapical abscess or granuloma.
- Osteomyelitis diagnosis involves detecting sequestra radiographically when lesion extends beyond apex.

Radiographic Features and Progression

- Early lesions may show no radiographic changes; diagnosis relies on clinical signs.
- Chronic lesions show lytic (radiolucent), sclerotic (radiopaque), or mixed bone changes.

Bone and Cortical Involvement

- Lamina dura around apex usually lost; bone resorption or new bone formation may occur.
- Cortical destruction possible, afecting structures like maxillary antrum floor and alveolar plates.

Differential Diagnosis

- Must distinguish from periapical cemental dysplasia (PCD) and enostosis (dense bone island).
- Radiolucent lesions may represent granulomas or radicular cysts; cysts often >1cm and cause cortical expansion.

Distinguishing Features: Enostosis vs Inflammatory Lesions

- Enostosis maintains normal periodontal ligament space width and has well-defined margins.
- Inflammatory lesions show irregular margins and loss of ligament space uniformity.

Definition and Source

- Periapical inflammatory lesions arise from necrotic pulp causing localized bone lesions near the tooth root apex.
- Infection spreading beyond the apex into bone marrow leads to osteomyelitis.

Pathogenesis

- Lesions develop due to pulp necrosis caused by bacterial invasion via caries or trauma.
- The inflammatory response affects bone around the tooth apex or periodontal tissues.

Clinical Symptoms

- Symptoms vary from asymptomatic to severe pain, facial swelling, fever, and lymphadenopathy.
- Symptoms depend on the lesion's stage and severity.

Radiographic Internal Structure

- Earliest sign is widening of periodontal ligament space at the apex without sclerosis initially.
- Later stages show mixed sclerosis and rarefaction; predominance defines sclerosing vs rarefying osteitis.

Periosteal Reaction

- Inflammatory periostitis can cause new bone formation, visible as a "halo shadow" in maxilary sinus.
- This reaction signifies active inflammation spreading beyond bone cortex.

Distinguishing Features: PCD vs Inflammatory Lesions

- PCD diagnosis relies heavily on clinical exam and tooth vitality testing due to overlapping radiographic features.
- PCD commonly affects mandibular anterior teeth; inflammatory lesions can affect any tooth.
- External root resorption: more frequent with inflammatory lesions.
- Mature PCD shows dense radiopaque centers within radiolucent areas, aiding differentiation.

Post-Treatment Radiographic Appearance

- After endodontic treatment or apical surgery, radiolucencies resembling rarefying osteitis may persist.
- These areas may contain dense fibrous scar tissue instead of normal bone.

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PERIAPICAL LESIONS

Question 1

What defines a periapical inflammatory lesion and what is the initial source of inflammation?

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PERIAPICAL LESIONS

Answer 1

A periapical inflammatory lesion is a local response of the bone around the apex of a tooth that occurs due to necrosis of the pulp or destruction of periapical tissues by extensive periodontal disease. The initial source of inflammation is a necrotic pulp.

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PERIAPICAL LESIONS

Question 2

What condition is diagnosed when the infection spreads beyond the tooth root apex into the bone marrow?

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PERIAPICAL LESIONS

Answer 2

When the infection spreads beyond the tooth root apex into the bone marrow and is no longer localized, the condition is called osteomyelitis.

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PERIAPICAL LESIONS

Question 3

What are some alternative names used for periapical inflammatory lesions?

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PERIAPICAL LESIONS

Answer 3

Periapical inflammatory lesions have been called acute apical periodontitis, chronic apical periodontitis, periapical abscess, and periapical granuloma.

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PERIAPICAL LESIONS

Question 4

How are radiolucent and radiopaque presentations of periapical inflammatory lesions termed radiographically?

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PERIAPICAL LESIONS

Answer 4

Radiolucent presentations are called rarefying osteitis, whereas radiopaque presentations are called sclerosing osteitis, condensing osteitis, or focal sclerosing osteitis.

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PERIAPICAL LESIONS

Question 5

What are the earliest radiographic changes seen in periapical inflammatory lesions?

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PERIAPICAL LESIONS

Answer 5

The earliest radiographic change is loss of bone density, usually seen as widening of the periodontal ligament (PDL) space at the apex of the tooth. Early lesions may show no sclerotic bone reaction.

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PERIAPICAL LESIONS

Question 6

How do periapical inflammatory lesions affect bone, and what terms are used depending on whether bone resorption or formation predominates?

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PERIAPICAL LESIONS

Answer 6

Periapical inflammatory lesions may stimulate either bone resorption or new bone formation. When bone formation predominates, the lesion is called periapical sclerosing osteitis; when bone resorption predominates, it is called periapical rarefying osteitis.

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PERIAPICAL LESIONS

Question 7

What are the typical clinical symptoms associated with periapical inflammatory lesions?

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PERIAPICAL LESIONS

Answer 7

Symptoms can range from asymptomatic to occasional toothache, to severe pain with or without facial swelling, fever, and lymphadenopathy.

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PERIAPICAL LESIONS

Question 8

What radiographic feature helps distinguish osteomyelitis from periapical inflammation?

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PERIAPICAL LESIONS

Answer 8

The presence of sequestra (dead bone fragments) detected radiographically helps distinguish osteomyelitis from periapical inflammation.

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PERIAPICAL LESIONS

Question 9

What is the main differential diagnosis for periapical inflammatory lesions, and how can they be distinguished?

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PERIAPICAL LESIONS

Answer 9

The main differential diagnoses are periapical cemental dysplasia (PCD) and enostosis (dense bone island). PCD often occurs at mandibular anterior teeth and shows a dense radiopaque structure in mature lesions, while enostosis has a well-defined border and normal periodontal ligament space. Clinical tests like tooth vitality are crucial for differentiation.