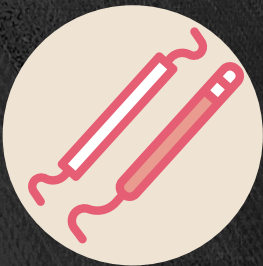


Operative dentistry



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Dental Caries – Definition & Classification According to Type and Location :

Dental Caries Definition :

- Dental caries is an infectious microbiological disease.
- It causes localized demineralization and destruction of calcified tooth tissues.
- Caused mainly by acid-producing bacteria.
- Acids first decalcify the inorganic portion, followed by disintegration of the organic portion.
- Caries involves alternating phases of:
 - Demineralization.
 - Remineralization.
- Calcium and phosphate ions in saliva can contribute to remineralization.
- Understanding the balance between demineralization and remineralization is essential for caries management.

Classification of Dental Caries I

▪ According to Type

Primary Caries

- Original carious lesion affecting a sound tooth.

Secondary / Recurrent Caries

- Occurs at the junction between a restoration and the tooth.
- It may progress underneath the restoration if the margins are not properly sealed.

▪ According to Location

Three main sites:

1. Pits and fissures → most susceptible.
2. Smooth enamel surfaces → areas that shelter plaque.
3. Root surface

▪ Pit and Fissure Caries

- Pits and fissures provide areas for plaque retention and bacterial colonization.
- Caries progresses through enamel toward the DEJ, then spreads laterally and penetrates dentin.

▪ Smooth Surface Caries

- Associated with plaque accumulation on neglected smooth enamel.
- The lesion progresses through enamel toward the DEJ, then into dentin.





▪ Root Caries

- Progresses more rapidly because cementum is extremely thin and provides little resistance.
- More prevalent with increasing age due to gingival recession.

Extent and Rate & Characteristics of Dental Caries

Classification of Dental Caries II

According to Extent

Incipient Caries

- First evidence of caries activity in enamel *Reversible.*
- Can be remineralized.

Cavitated Caries

- Enamel surface is broken *Usually advanced into dentin.*
- Non-reversible. *Remineralization is not possible.*

Arrested Caries

- Carious process is reversed. *The lesion becomes remineralized.*

According to Rate

Acute Caries

- Rapid progression.
- Demineralization exceeds remineralization.
- Lesion is soft and lighter.

Chronic Caries

- Slow progression.
- More time for remineralization.
- Lesion becomes harder and darker.

Characteristics and Factors Affecting Dental Caries

- Caries development depends on the balance between:
 - Demineralization.
 - Remineralization.
- Pits and fissures are highly susceptible because they provide sheltered areas for plaque and bacteria.
- Smooth-surface caries is associated with plaque accumulation and poor oral hygiene.
- Root surfaces are more susceptible to rapid caries progression because of the thin cementum.





Factors Affecting the Pattern and Progression of Caries

The pattern and progression of caries are influenced by:

- Bacterial activity. Plaque retention Tooth surface/site.
- Saliva and its mineral content. Time.
- Balance between demineralization and remineralization.

Dental Caries Control & Non-Carious Lesions

Dental Caries Control

- Effective caries control requires addressing the underlying cause, not only restoring the resulting defect.

Important Measures

- Removal of carious and defective tooth structure when operative treatment is indicated.
- Proper cavity design and placement of margins away from defective areas.
- Avoiding cavity margins ending in pits, fissures or angular grooves.
- Removal of weak, undermined or friable enamel.
- Maintaining good oral hygiene.
- Use of topical fluoride.
- Use of appropriate antibacterial and remineralizing agents.
- Correction of contributing dietary factors.

Important:

Failure to control the underlying cause can lead to continued lesion progression and restorative failure.

Non-Carious Lesions I

Non-carious lesions are lesions of non-microbial origin that cause defects in tooth structure.

1. Abrasion

- Pathologic tooth surface loss caused by direct frictional forces.
- Common example: toothbrush abrasion.
- Improper brushing may produce localized cervical labial lesions.





Lesions may be:

- Linear. Smooth. Highly polished.

Other causes include:

- Toothpicks. Occupational habits. Faulty dentistry.

2. Erosion

- Pathological loss of tooth structure resulting from chemico-mechanical action, mainly acids.

Exogenous acids:

- Lemon juice. Acidic drinks. Acid fumes.

Endogenous acids:

- Gastric acids from frequent regurgitation.
- Produces smooth tooth surface lesions.

3. Abfraction

- Cervical defect associated with abnormally heavy forces and faulty occlusion.
- Tooth flexure produces compressive and tensile stresses.
- Excessive stresses may produce microfractures in cervical enamel.
- Characteristically produces a wedge-shaped cervical lesion.
- May occur alone or together with abrasion/erosion.

Non-Carious Lesions – Mechanical Wear & Developmental Defects

Non-Carious Lesions II

1. Attrition

- Mechanical wear caused by direct friction between contacting teeth.
- Normally physiological, continuous and age-dependent.
- Can be accelerated by bruxism.

Produces:

- Flattening of inclined planes.
- Wear facets.
- Cusp/incisal edge wear.
- Possible dentin exposure.
- Reduction in tooth vertical dimension.
- Flat proximal contours.

2. Enamel Hypoplasia

- Defect caused by improper enamel matrix formation due to injury to ameloblasts during enamel formation.





May appear as:

- Opaque white/brownish areas.
- Grooves.
- Loss of part of enamel in severe cases.

Pits.

Depressions.

3. Enamel Hypocalcification

- Defect caused by improper mineralization of the enamel matrix.
- The problem occurs during mineralization, not matrix formation.
- Affected areas are not necessarily structurally defective.
- Characteristically appear chalky white.
- May range from isolated pits to linear defects or patches.

4. Discoloration

- Deviation from normal tooth shade/color.

Extrinsic

- Surface staining, calculus or surface deposits.
- May be removed by cleaning and polishing.

Intrinsic

- Caused by changes within tooth tissues.

Examples include:

- Hypoplasia/hypocalcification.
- Tetracycline staining.
- Discoloration following pulpal necrosis.

5. Malformation

- Deviation from normal tooth shape or size.
- Usually hereditary in origin.

Size abnormalities include:

- Microdontia.
- Macrodontia.

Common shape abnormality:

- Peg-shaped lateral incisor.

6. Fracture

- Separation or loss of tooth structure caused by trauma such as:
 - Fall. Blow.
 - Sudden biting on a hard substance.
- May range from simple enamel chipping to extensive crown fracture, root fracture or avulsion.
- Weakened teeth may also fracture under normal masticatory forces.

