

Environmental Alterations of Teeth

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Environmental Alterations

- Developmental
- Postdevelopmental
- Discoloration
- Localized disturbances of eruption

Factors

- Systemic
 - Birth-related
 - Medications
 - Systemic infections
 - Inherited
 - Malnutrition
 - Metabolic diseases
 - Neurologic
- Local
 - Mechanical trauma
 - Electric burn
 - Irradiation
 - Local infections

Environmental Alterations Clinical Findings

- Hypoplasia
 - Pits, grooves, loss of enamel
- Diffuse opacities
 - Variations in translucency; white opacity that blends with normal enamel
- Demarcated opacities
 - Sharp demarcation from normal enamel

Environmental Alterations Clinical Findings

- The area of affected enamel correlates with the area of ameloblastic activity.
- Opacities are more frequent than areas of hypoplasia.
- Exanthematous fever

Environmental Alterations Clinical Findings

- Location of defects correlates with the developmental stage of the affected teeth.
- Bilateral and symmetric
- If the accident happened in the first 2 years
 - Permanent anterior teeth and 1st molars
- If the accident happened during 4-5 years
 - Cuspids, premolars and second molars

Turner's teeth

- Cause: Periapical inflammatory disease in deciduous teeth, trauma
- Time and severity
- Focal to entire enamel
- Posterior more frequently than anterior except with history of trauma
- When trauma: maxillary central incisors
- Discoloration, enamel hypoplasia, dilaceration or total malformation

Turner's teeth



Turner's teeth



Medications and Radiations

- Antineoplastic
 - Severity related to age of patient, form of therapy and dose
- Radiation
 - More severe alterations
- Alterations
 - Hypodontia, microdontia, enamel hypoplasia, radicular hypoplasia, mandibular hypoplasia

Fluorosis

- 1.0 ppm reduces caries by 50-70%
- Recent increase in fluorosis
- Optimum should be lowered
- Hypomineralized enamel; retention of amelogenins
- Hypomaturation
- White chalky areas; aesthetic concern; anterior teeth
- Caries-resistant teeth





Syphilitic hypoplasia

- Hutchinson's incisors
- Mulberry molars

Question

- What is the Hutchinson's triad?

Hutchinson's Incisors



Mulberry Molars



Postdevelopmental Loss of Tooth Structure

- Attrition
- Abrasion
- Erosion
- Abfraction

Attrition

- Occlusal and incisal surfaces
- Bruxism



Abrasion

- External agent
- Demastication



Erosion

- Chemical
- Food, drinks, medications, swimming pools with low ph, gastric secretions (perimolysis), environmental



Erosion

Abfraction

- Cervical areas
- V-shaped defect deep and narrow
- Smaller than the thickness of tooth brush
- Mandibular teeth (lingual orientation of teeth)
- Subgingival areas

Internal and External Resorption

- External more frequent
- Most external resorption cases are mild
- Common factors: trauma, Ortho and Perio treatment, pressure from impacted teeth, occlusal forces, tooth impaction
- Usually asymptomatic
- Internal: Coronal part necrotic; apical vital
- Internal: Inflammatory or replacement/metaplastic
- Pink tooth of Mummery

Internal and External Resorption

- Internal: balloon-like
- External: moth-eaten
- Mesio-buccal-distal rule when in doubt
- Invasive cervical resorption
 - External
 - Can extend apically or coronally
 - Multiple idiopathic root resorption

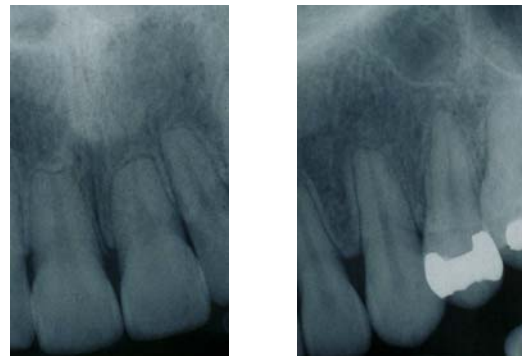
Resorption



Resorption



Resorption



Resorption



Tooth Discoloration

- | Extrinsic | Intrinsic |
|-------------------------|----------------------------------|
| • Caries | • A.I. |
| • Bacterial stains | • D.I. |
| • Iron | • Fluorosis |
| • Tobacco | • Erythropoietic porphyria |
| • Foods and beverages | • Hyperbilirubinemia |
| • Gingival hemorrhage | • Ochronosis |
| • Restorative materials | • Trauma |
| • Medications | • Localized red blood cell lysis |
| | • Medications |

Caries



Bacterial Staining

- Chromogenic bacteria
- Children
- Green to black-brown or orange
- Maxillary teeth, anterior, gingival area
- Ferric (saliva, crevicular fluid) sulfide (H_2SO_4)



Food and Beverages



Extrinsic stains

- Tobacco:
 - Tar
 - Lingual surfaces of mandibular incisors
- Food and beverages
 - Lingual surface
- Gingival hemorrhage
 - Green (hemoglobin → biliverdin)

Extrinsic stains

- Restorative
 - Amalgam (young patients)
- Medications
 - Iron
 - Iodine
 - Stannous (tin) fluoride
 - Chlorhexidine
 - Listerine

Intrinsic stains

- Congenital erythropoietic porphyria
 - A.R.
 - Increased synthesis and secretion of porphyrins
 - Enamel and dentin
 - More serious in deciduous
- Alkaptonuria
 - Blue-black discoloration

Congenital Erythropoietic Porphyria



Congenital Erythropoietic Porphyria



Intrinsic stains

- Hyperbilirubinemia
 - Erythroblastosis fetalis
 - Biliary atresia
 - Premature birth
 - Neonatal hepatitis
 - Biliary hypoplasia
- Trauma
 - Dark gray
 - Aseptic
 - Calcific metamorphosis
 - Yellow
- Localized red blood cell destruction
- Leprosy

Hyperbilirubinemia



Tetracycline

- Yellow to dark brown
- Homologues → gray-brown or yellow
- Minocycline can stain already formed teeth
- Crosses placental barrier
- Severity depends on
 - Time of administration
 - Dose
 - Duration

Tetracycline



Tetracycline



Tetracycline



Tetracycline



Tetracycline



Localized Disturbances in Eruption

- Primary impaction
 - Extremely rare in deciduous teeth
 - Second molars
 - Third molars and maxillary cuspids
 - 1st molars and maxillary 2nd molars rarely
 - Lack of space, tumors, trauma, syndromes
 - Classified according to the angulation

Localized Disturbances in Eruption

- Ankylosis: Cessation of eruption after emergence
 - Fusion of cementum or dentin with bone
 - Infraocclusion, secondary retention, submergence, reimpaction, reinclusion
 - Causes: Trauma, local developmental disturbance
 - Genetic predisposition
 - Problems:
 - Adjacent teeth incline toward affected tooth
 - Periodontal and occlusal problems
 - Impaction of permanent teeth

