

Developmental Alterations of Teeth

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Alterations in Number

Alterations in Size

Alterations in Shape

Alterations in Number

General Information

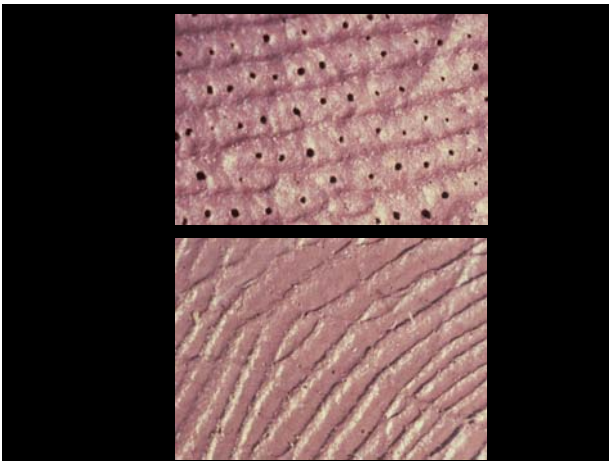
- Genetic control – environmental influence
- Many syndromes
- Hypodontia: A.D., A.R., X-linked
- PAX-9, MSX1, AXIN2
- Affected genes tend to correlate with pattern of missing teeth
- Interesting statistical association: hypodontia as a risk for ovarian cancer
- AXIN2 and familial colorectal cancer

Hypodontia

- Anodontia
- Oligodontia
- Genetic & environmental influence
- Evolution
- 2 – 10 % excluding 3rd molars (~20%)
- F>M
- Lower and upper 2nd premolars, maxillary lateral incisors, lower central
- Permanent > Deciduous
- Missing deciduous and lack of permanent
- Association with microdontia

Hypodontia

- PAX9 → permanent molars, primary molars, 2nd premolars, permanent mandibular incisors
- MSX1 → oligodontia
- He-Zhao mutation → permanent teeth
- AXIN2 → permanent 2nd, 3rd molars, second premolars, maxillary lateral incisors



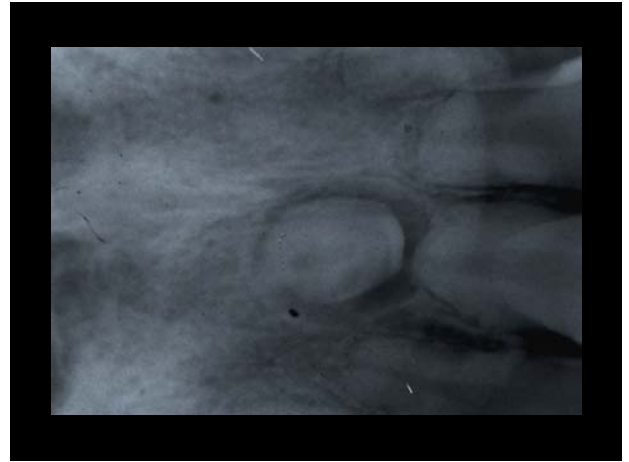
Single Incisor

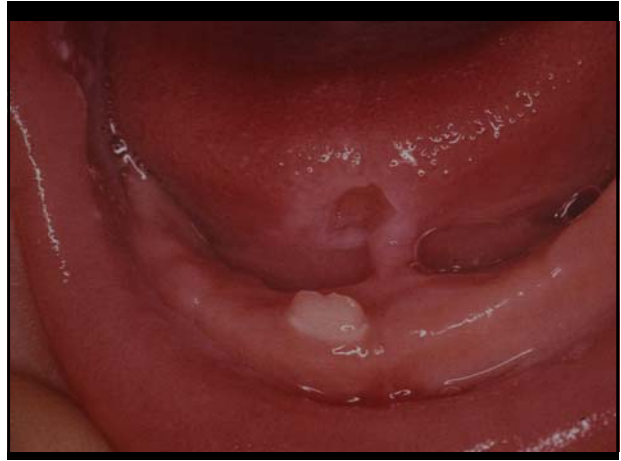
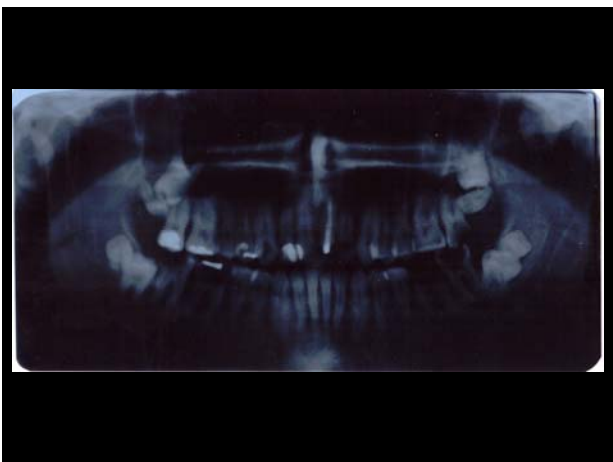
- Holoprosencephaly, A.D.; hypotelorism
- Defects in the midline of the face
- Growth retardation with/out endocrinopathies
- Exceedingly rare as an isolated finding

Hyperdontia

- Atavism
- Single tooth most frequently
- Permanent; maxilla; unilateral
- 2M.F
- Non-teeth bearing sites
- Mesiodens, 4th molars (distomolar, paramolar)
- Supplementary (normal size-shape)
- Rudimentary (abnormal size-shape)
 - Conical, tuberculate, molariform
- Mandibular incisors very rare
- Hyperdontia vs. dental transposition
- Natal/Neonatal teeth (Riga-Fede syndrome)







Alterations in Size

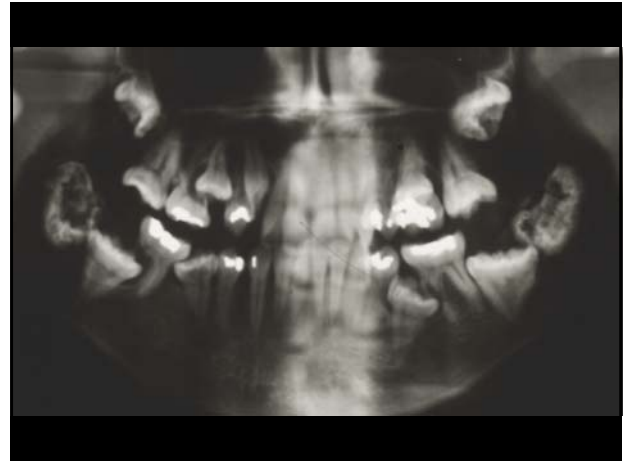
Microdontia

- Relative vs. true (macrognathia)
- Genetics, hypopituitarism
- Peg lateral (not unusual), 3rd molars

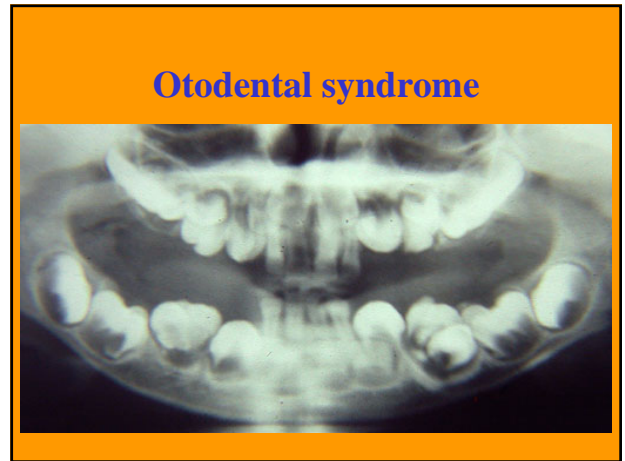


Macrodontia

- Megalodontia, megadontia
- Relative vs. true (micrognathia)
- Pituitary gigantism, otodental syndrome, XYY males, pineal hyperplasia with hyperinsulism
- Hemihyperplasia



Otodental syndrome

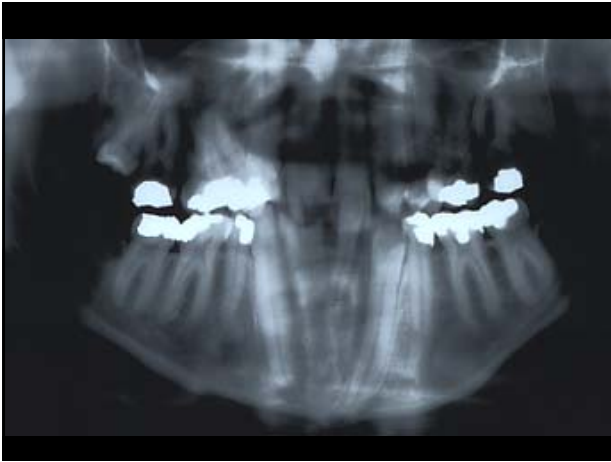


Oculo-facio-cardio-dental syndrome

- (1) Eye anomalies: congenital cataract and microphthalmia, or secondary glaucoma
- (2) Facial abnormalities: (long narrow face, high nasal bridge, pointed nose with cartilages separated at the tip, cleft palate, or submucous cleft palate
- (3) Cardiac anomalies: atrial septal defect (ASD), ventricular septal defect (VSD), or floppy mitral valve; and
- (4) Dental abnormalities: canine **radiculomegaly**, delayed dentition, **oligodontia**, persistent primary teeth, or variable root length.

Other less common findings are: sensorineural hearing loss, septate vagina, and syndactyly of toes 2-3. Inheritance may be an X-linked dominant trait, lethal in the male.





Alterations in Shape

Gemination & Fusion

- Gemination: one tooth bud → two crowns
- Fusion: two tooth buds → one tooth (dentin)
 - Usually separate pulp canals
- The term “twinning” is controversial
- Gemination: Count is normal
- Fusion: Count reveals missing tooth
- Primary > permanent; anterior maxilla





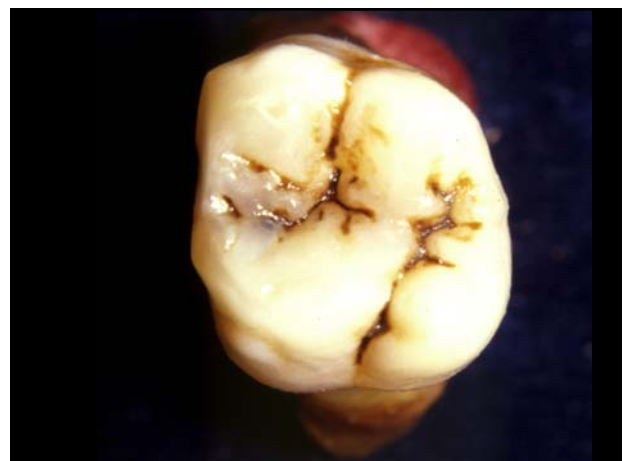
Concrecence

- Union of two teeth by cementum only
- Developmental or postinflammatory
- Repair by cementum
- Posterior maxilla; 2nd and 3rd molars
- Extraction is difficult



Accessory Cusps

- Cusp of Carabelli
 - ML cusp of maxillary molar, cusp or pit or fissure; Caucasians
 - Other teeth larger mesiodistally
- Talon cusp
 - Extra cusp; mostly lingual surface; anterior teeth; permanent, maxillary lateral or central incisors; can contain pulp
 - Rubinstein-Taybi syndrome





Accessory Cusps

- Dens Evaginatus
 - Central groove or lingual ridge of buccal cusp of permanent premolar or molar
 - Bilateral; premolars, Asians
 - Pulpal extension
 - Prone to fracture
 - Apexification necessary



Shovel-shaped Incisors

- Asians, Native Americans, Alaskans
- Prominent lateral margins
- Deep fissure
- Maxillary lateral and central incisors



Protostylid molar

- Mandibular molars
 - Primary or permanent
- Mesiobuccal cusp



Dens Invaginatus (Dens in Dente)

- Invagination of crown or root lined by enamel
- Coronal and radicular
- Permanent laterals, centrals, premolars, canines, molars
- Maxilla > mandible

Dens Invaginatus (Dens in Dente)

- Coronal: Three types
 - Invagination confined to crown
 - Invagination below CE junction; may or may not communicate with pulp
 - Through the root; communication; apical pathosis with vital pulp
- Dens in dente: large invagination

Dens Invaginatus (Dens in Dente)

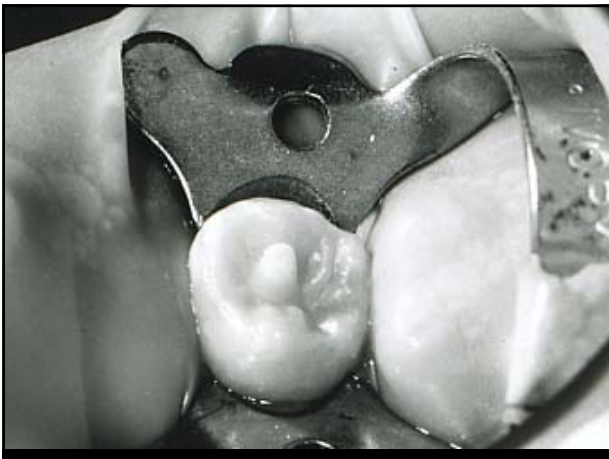
- Radicular: Abnormal proliferation of Hertwig's root sheath
- Enlarged root; invagination on the lateral aspect





Dens evaginatus

- Central tubercle located in the central groove or lingual ridge
- Molars, premolars
- Mandible



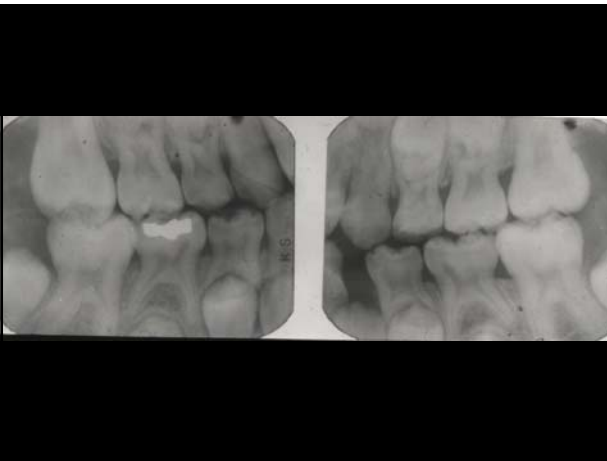
Ectopic Enamel

- Enamel pearls; enamel only or may contain dentin and pulp
 - Maxillary molars; Asians
- Enamel extensions (projections): dipping of enamel from CE junction towards bifurcation
 - Mandibular molars, Asians
- Weak periodontal attachment
- Buccal bifurcation cysts?



Taurodontism

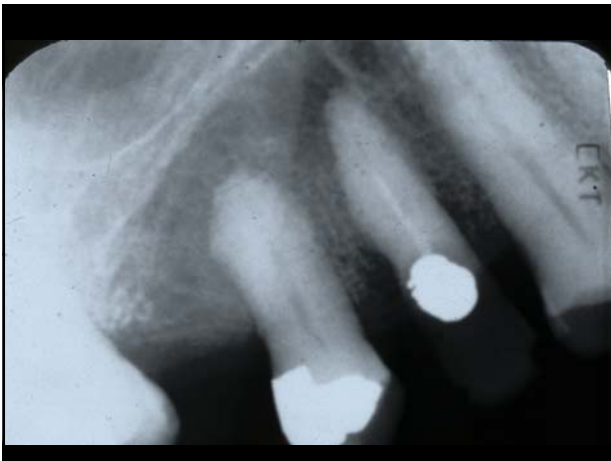
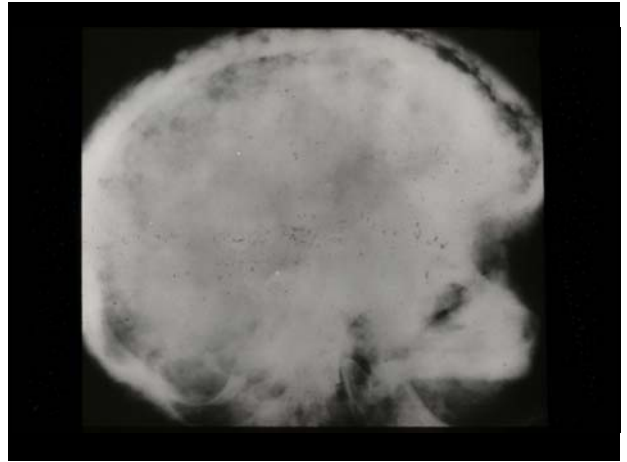
- Enlargement of pulp chamber
 - Increased apico-occlusal height
 - Bifurcation close to the apex
- Molars; premolars (controversial)
 - Increasing severity from 1st to 3rd
- Hypo, meso, hyper-taurodontism
- Unilateral or bilateral; permanent
- Syndromes
- Periodontically lucky patients



Hypercementosis

- Non-neoplastic deposition of excessive cementum continuous with the radicular cementum.
- Local and systemic factors
- Intact lamina dura
- Isolated or multiple
- Paget's disease of bone





Dilaceration

- Abnormal angulation or bend in the root or crown
- Result of injury



Supernumerary Roots

Any tooth can have extra roots
Molars more frequently
Mandibular canines and premolars
Many times visible on x-ray
Extractions and endodontic treatment

