ПОЛТАВСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

Department of Orthodontic

Ukraine NOW ua

4 course

Individual teeth anomalies. Etiology, pathogenesis, prophylaxis, clinical presentation and diagnostics

Lector
Anastasiia Liakhovska

Poltava 2024

Plan of lecture

- Etiology
- Pathogenesis
- Clinic
- Diagnostics
- Treatment and Prophylaxis

CLASSIFICATION OF MALOCCLUSION

Classification of D.A. Calvelis (1957)

1. Anomalies in the number of teeth:
- adentia (reduction of the number of teeth) is partial and complete
- overcomplete teeth

2. Anomalies in the size and shape of teeth:
- giant teeth
- thorny teeth
- ugly shapes of teeth
- Hutchinson's teeth, Fournier

3. Anomalies in the structure of the hard tissues of the teeth:
- hypoplasia of dental crowns

4. Violation of the process of teething:
- premature (early) eruption of teeth
- late eruption of the tooth

Individual teeth anomalies

- Anomalies of Color
- Anomalies of Number
- Anomalies of Size
- Anomalies of Shape
- Anomalies of Structure

Individual teeth anomalies

inherited innate acquired

Etiological factors:

-Antenatal -Postnatal

Etiological factors:

-Endogenic -Exogenic

Discoloration of Teeth

By:

- a) Surface deposits - extrinsic staining such as smoking , coffee , tea
- b) Changes in the structure or thickness of the dental hard tissues
- c) Diffusion of pigments into the dental hard tissues

DISCOLORATION

Extrinsic

- Chromogenic bacteria- pigment producing bacteria
- Iron
- Tobacco
- Food and beverage
- Restorative materials
- Medications

Iron stain

Restorative materials

discoloration

Intrinsic

- **Erythropoietic porphyria**
- **Hyperbilirubinemia**
- **Trauma**
- **Medications**
- **Changes in structure**

✓ Enamel hypoplasias, fluorosis

✓ Amelogenesis imperfecta Enamel opacities

✓ Enamel caries

✓ Dentinogenesis imperfecta

✓ Age changes in dental tissues

Erythropoietic porphyria

Hyperbilirubinemia

Figure – The green discoloration of this child's teeth is the result of severe hyperbilirubinemia. The child's bilirubin levels had been elevated above 20 mg/dL for 5 months.

Tetracycline stain

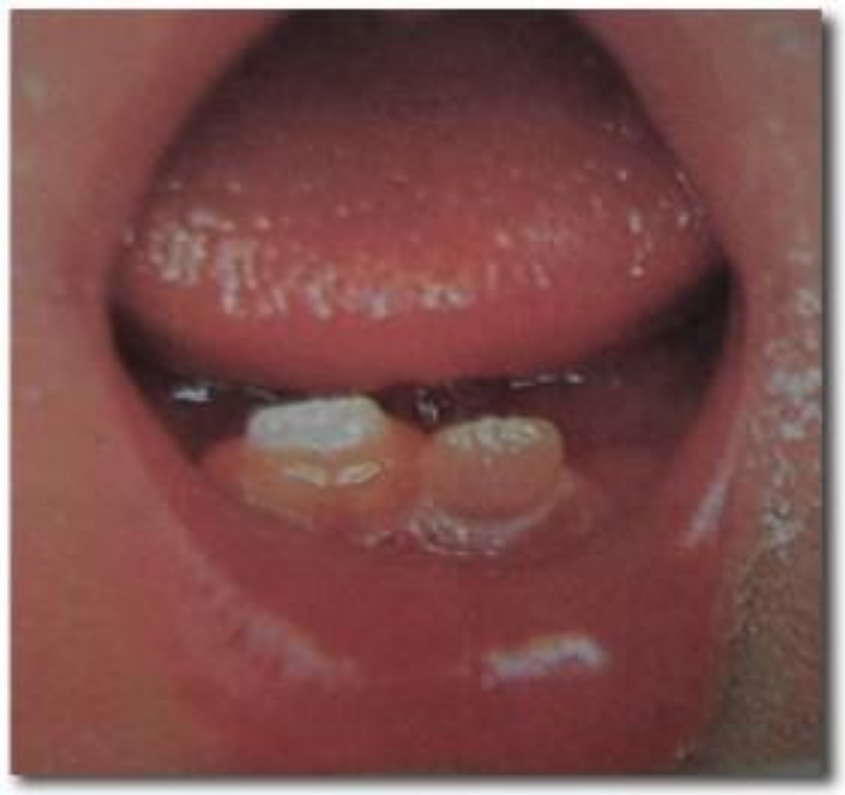
Trauma

Disorders of eruption

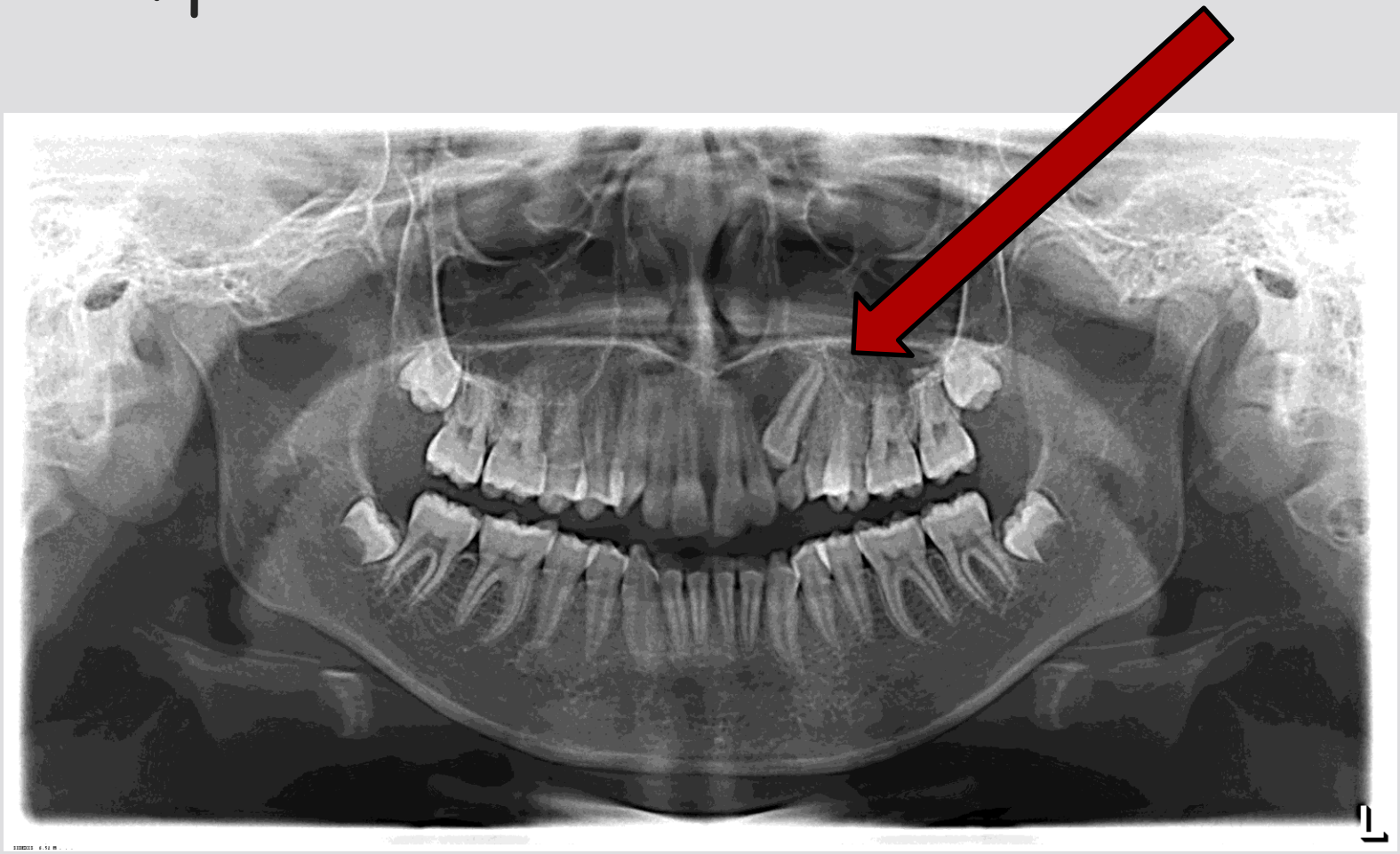
- **Early eruption(Premature)** : before the proper time
- ·**Natal** - if present at birth
- ·**Neonatal** - if erupted shortly after birth 80% of these teeth are the mandibular incisors .
- **Late eruption**

a) **Impacted** teeth (retention): partial or complete;

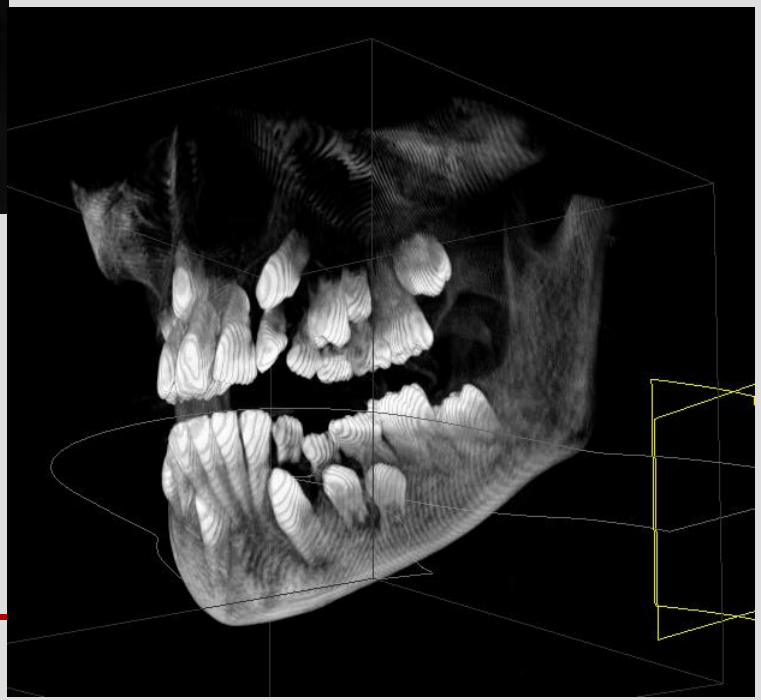
Natal and Neonatal teeth



Impacted teeth



Clinical case. Girl O., 9 years old

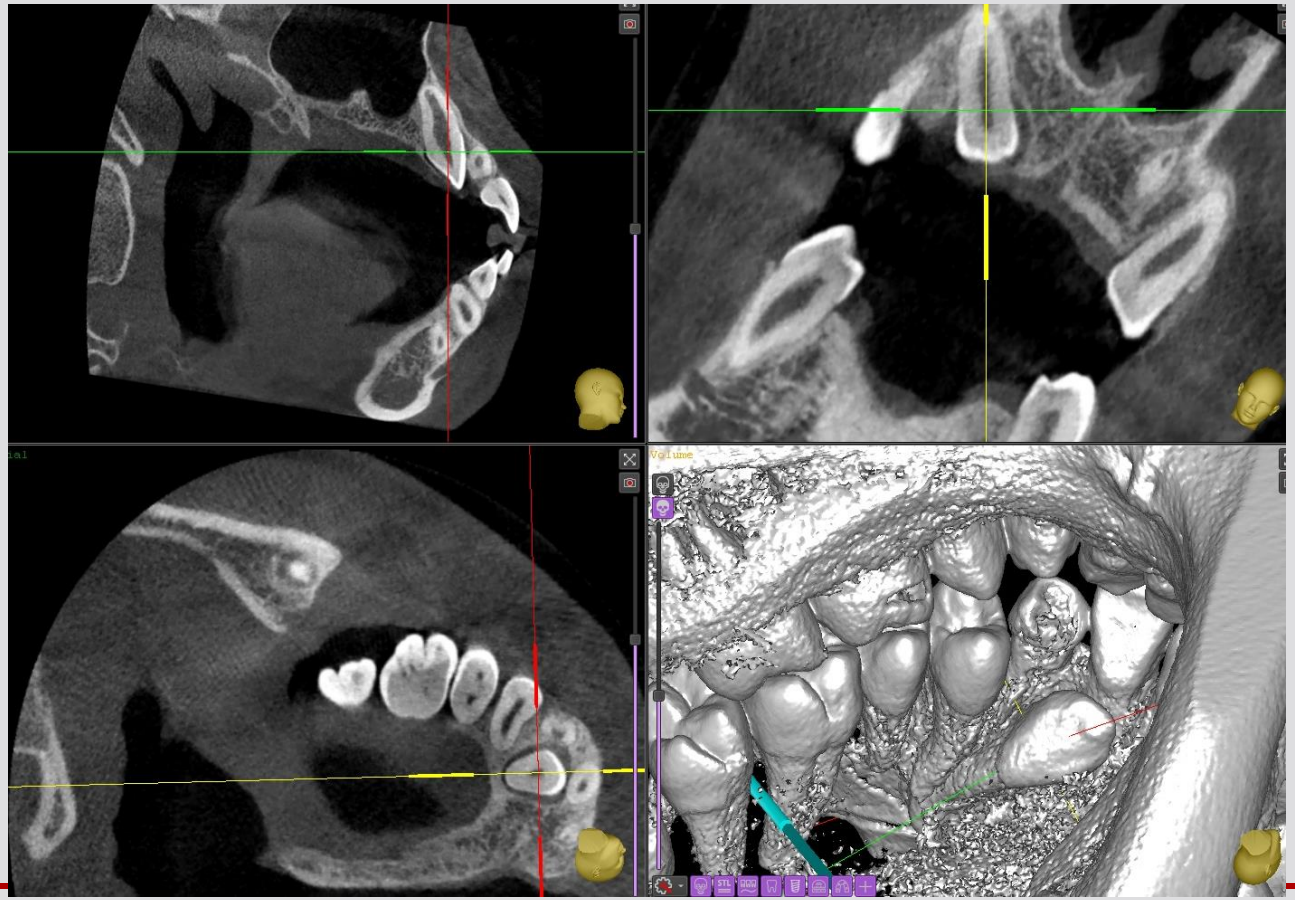


Clinical case. Boy M., 13 years old

- X-ray

Clinical case. Boy M., 13 years old

- CBCT



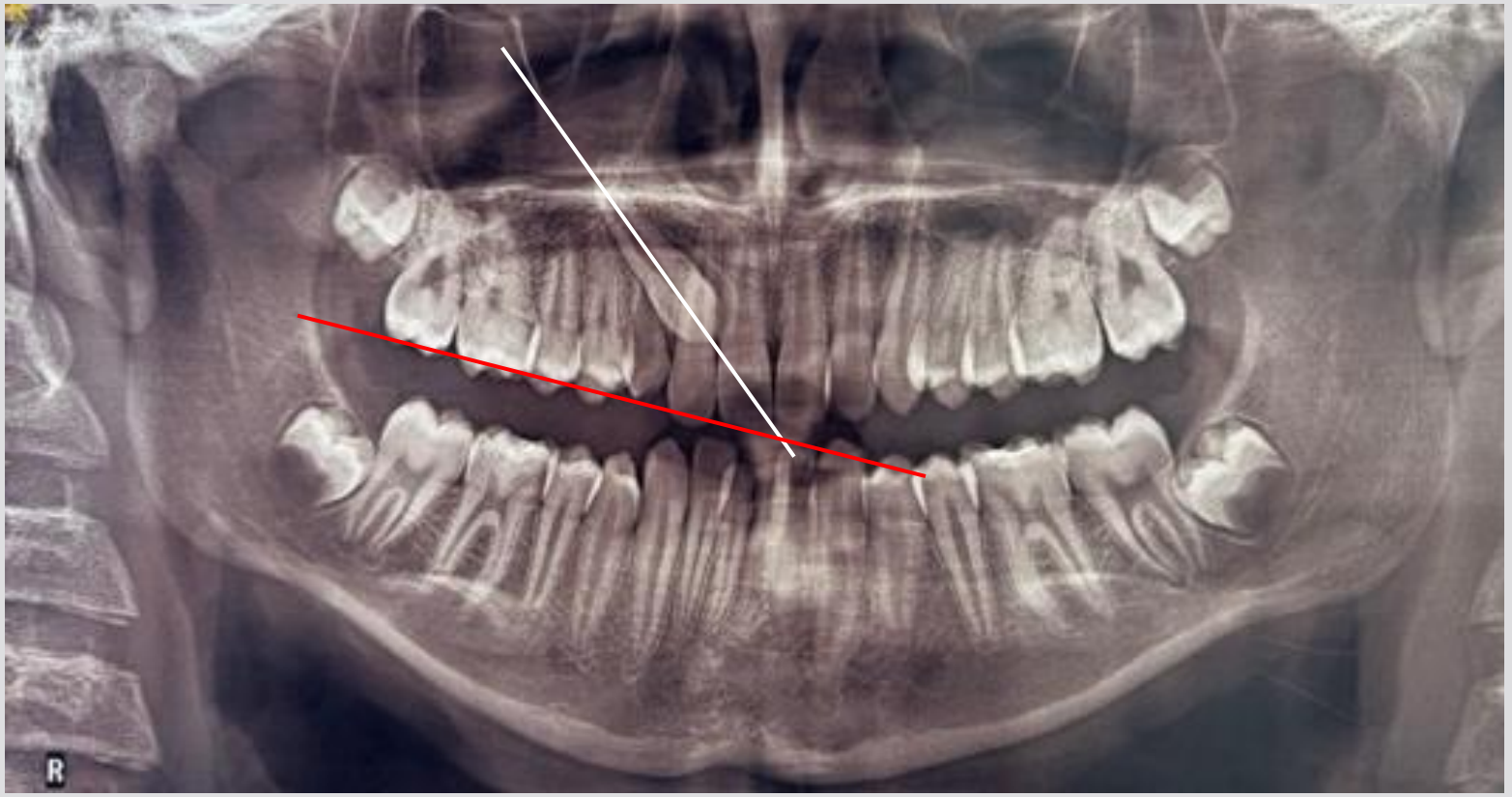
3 degrees of retention

(Khoroshilkina with co-authors (1977, 1982)

- **1st degree - called idiopathic** (conditional) retention of teeth and characterized by slow development of the tooth bud compared to symmetrical;
- **2nd degree** - retention of teeth due to the inclination of their longitudinal axes in relation to the tooth standing in front by 15°, lack of space, underdevelopment of dental arches, etc.
- **3rd degree - permanent retention**, characterized by the placement of the tooth not in the direction of its eruption.

Clinical case. Boy M., 13 years old

- X-ray



Ankylosis

Anomalies of Number

1. **Anodontia:** a complete absence of one or both dentition.
2. **Hypodontia (partial anodontia):** a deficiency in tooth number.
3. **Hyperdontia (Supernumerary Teeth):** an excess in tooth number.
   a. **Mesiodens** b. **Distomolar**

Hyperdontia

•Prevalence of supernumerary teeth is about 1%-3% (higher rate in Asians)
• Single tooth hyperdontia represent 75%-85% of cases
• More common in permanent dentition
• Almost 90% in maxilla
• Maxillary incisor region most common site then 4th molars,premolars and canines

Distomolar
(fourth molar)

Mesiodens

supernumerary
bicuspid

Hyperdontia and Cleidocranial dysplasia

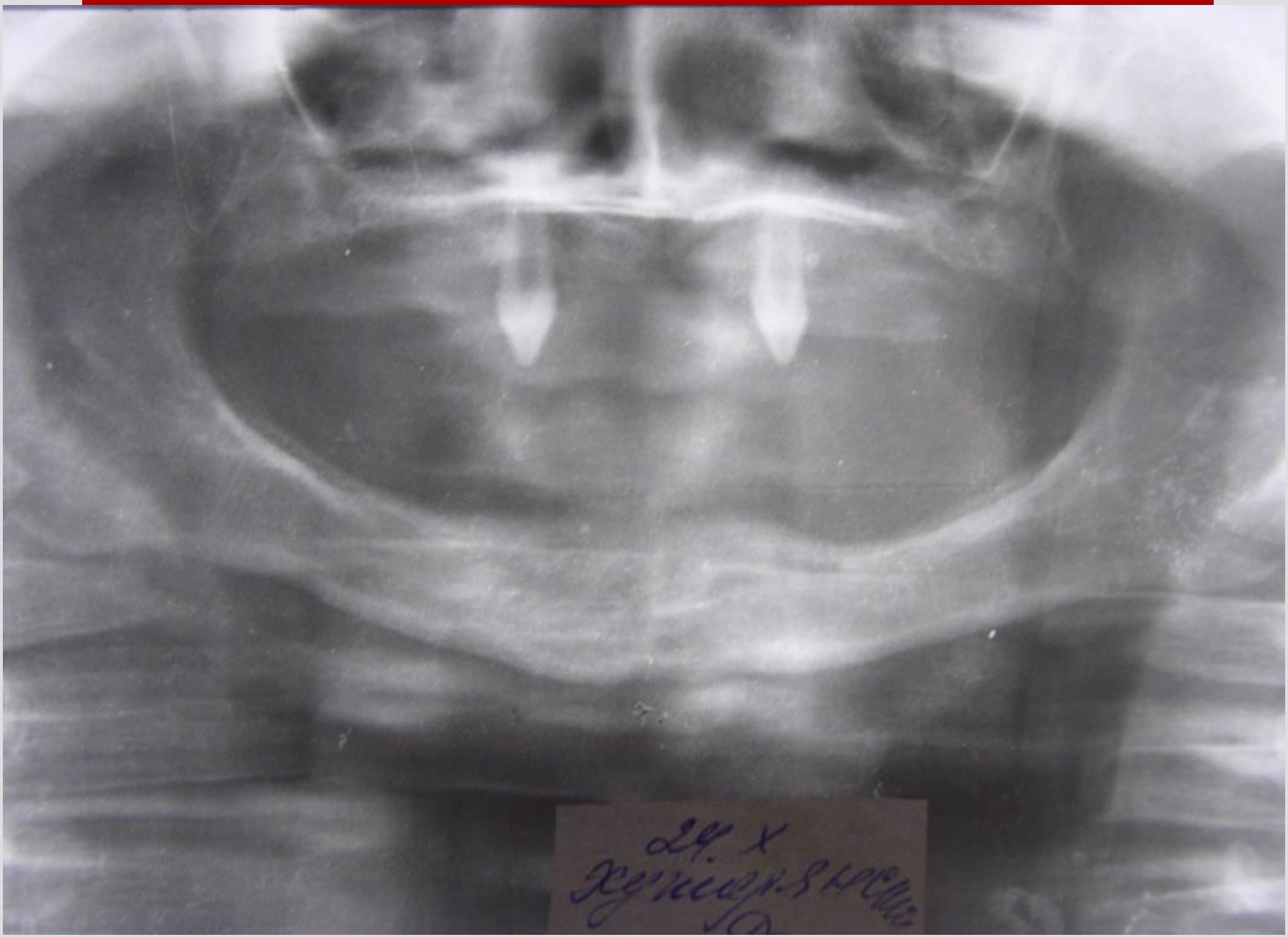
Count the teeth in Slide — there are more than 50. This patient has cleidocranial dysplasia (CCD). This is inherited as an autosomal dominant trait, the gene maps to chromosome #6. The gene encodes a protein called Core Binding Factor Alpha 1 (CBFA1).

Hypodontia

- Common dental anomaly
  - ✓3.5%-8% (excluding third molars)
  - Female predominance about 1.5:1
  - Uncommon in primary dentition (<1%)
  - About 20-23% of population missing third molars
  - After third molars, second premolars and laterals most frequent

congenitally missing 2 premolar

ectodermal dysplasia



Anomalies of Size

1. Microdontia
2. Macrodontia

Microdontia

- Teeth are smaller that usual
- Maxillary lateral incisor most frequently affected

Macrodontia

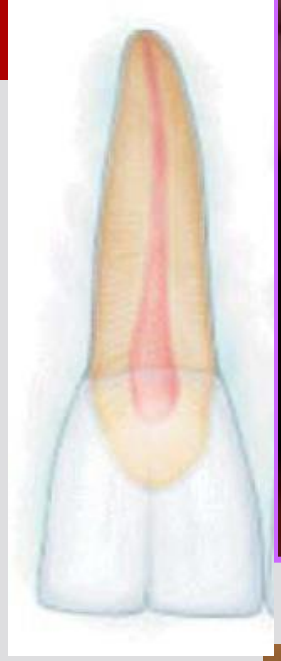
- Teeth are larger than usual
- Has been noted in association with pituitary gigantism and hemifacial hyperplasia

Anomalies of Shape

1. Gemination
2. Fusion
3. Concrescence
4. Dilaceration
5. Enamel Pearl (enameloma)
6. Talon Cusp
7. Taurodontism
8. Dens in Dente (dens invaginatus)
9. Dens Evaginatus
10. Supernumerary Roots
11. Hypercementosis
12. Conical shaped teeth

Gemination

The partial development of two teeth from a single tooth bud following incomplete division.



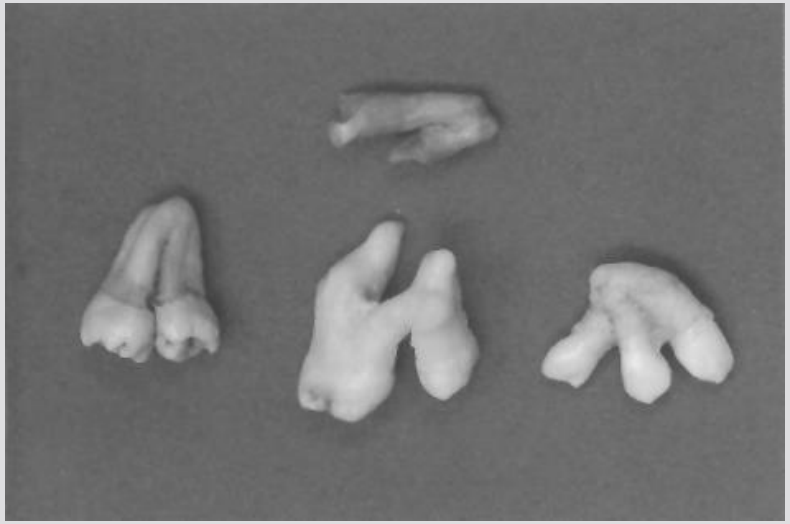
An incomplete division of a single tooth bud resulting in a bifid crown with a single pulp chamber.

Fusion

The dentinal union of two embryologically developing teeth.

Fused teeth can contain two separate pulp chamber, may appear as large bifid crowns with one chamber.

Concrescence



An acquired disorder in which the roots of one or more teeth are united by cementun alone after formation of the crowns.

GEMINATION	FUSION	CONCRESCENCE
One bud	Two buds	Two buds
One tooth	Two teeth	Two teeth
One canal	Dentin union	Cementum union

conical shaped teeth

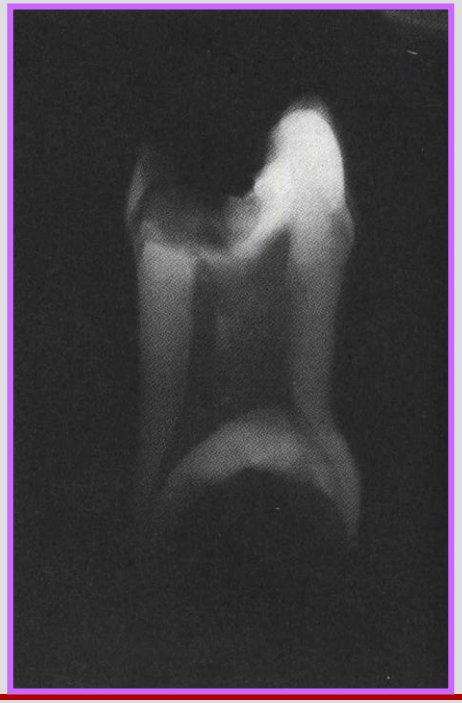
Talon's cusp

Dens in Dente

A condition resulting from the invagination of the inner enamel epithelium producing the appearance of a tooth within a tooth.

Taurodont

Taurodont teeth are characterized by having a significantly elongated pulp chamber with short roots



Dilaceration

Dilaceration refers to an abnormal bend of the root during its development and is thought to result from a traumatic episode.

Anomalies of Structure

1. Enamel hypoplasia caused by amelogenesis imperfecta (genetic)

Anomalies of Structure

2.Enamel Hypoplasia caused by febrile Illness or Vitamin Deficiency

3.Enamel hypoplasia resulting from local infection or Trauma

a. Turner's Tooth

Turner Tooth

Local Enamel hypoplasia

Anomalies of Structure

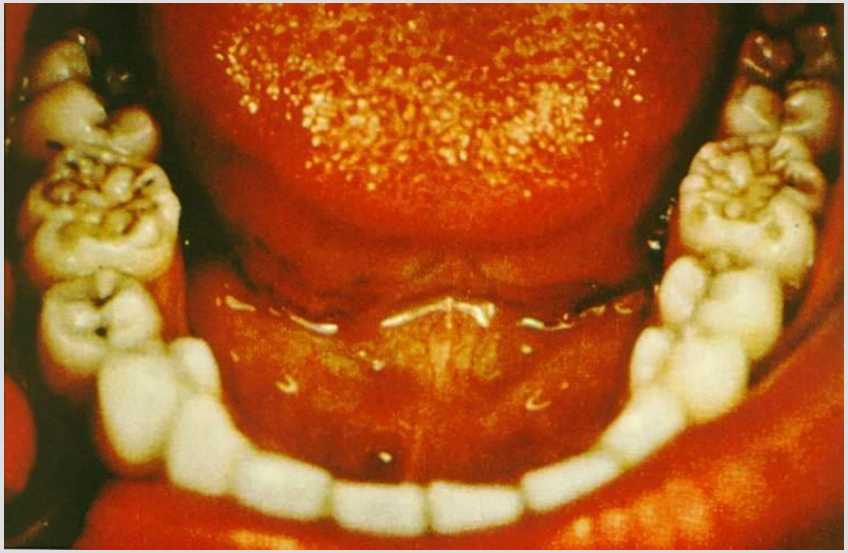
4 Enamel hypoplasia resulting from fluoride Ingestion (dental fluorosis)

Anomalies of Structure

5. Enamel hypoplasia resulting from congenital syphilis (Treponema pallidum)

a. Hutchinson's incisors

b. Mulberry molars



Anomalies of Structure

6 Enamel hypoplasia resulting from birth injury, premature birth or idiopathic factors

7 Enamel hypocalcification

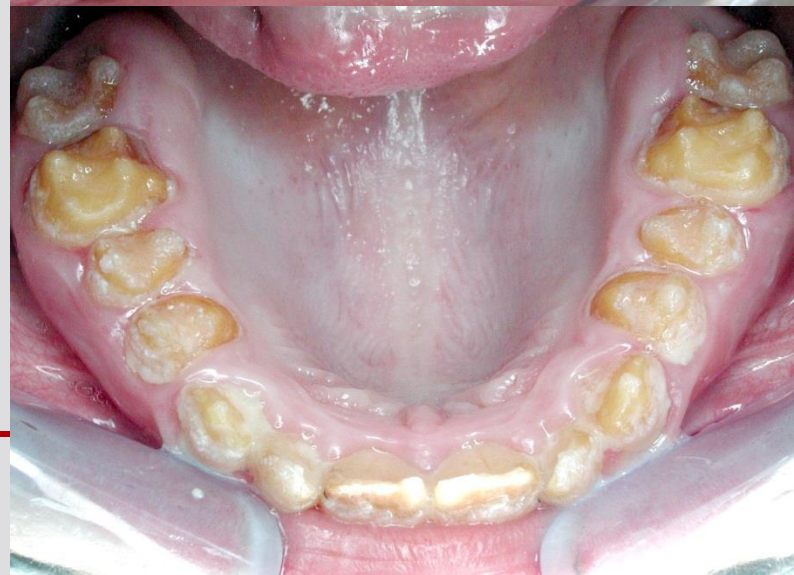
Anomalies of Structure

8. Dentinogenesis imperfecta
9. Dentin dysplasia

Dentinogenesis imperfecta

Anomalies of Structure

10. Regional Odontodysplasia (Ghost teeth)



Amelogenesis and dentinogenesis imperfecta

Postdevelopmental tooth loss

Tooth wear

- **Attrition**

  Caused by tooth to tooth contact

- **Abrasion**

  Caused by external agent

- **Erosion**

  Caused by chemical process

Internal resorption

External resorption

Attrition

Pathological attrition may result from

1- Abnormal occlusal relationship

2- Bruxism and habits such as tobacco and betel chewing

3- Abrasive dust particles - consist of silica

4- Abnormal tooth structure such as amelogenesis imperfecta and dentinogenesis

Attrition can be treated by applying replacement crowns or onlays, which restore the natural size and strength of the tooth

Abrasion – pathological wearing away of tooth structure due to repetitive friction of a foreign body

f Examples:

1- Nuts and million seed abrasion

2- Toothbrush abrasion

3- Habitual abrasion in pipe-smokers

4- Occupational abrasion e.g. nails, musical instruments

5- Ritual abrasion - related to certain tradition

Erosion- loss of tooth structure resulting from chemical action (acid action)

- ***Dietary erosion:*** excessive intake of acidic beverages or sucking of citrus fruits
- ***Occupational erosion:*** battery factories

Tooth Erosion

Resorption

- Physiological resorption
- Pathological resorption
  - External - start from the root surface
  - Internal - start from the pulp

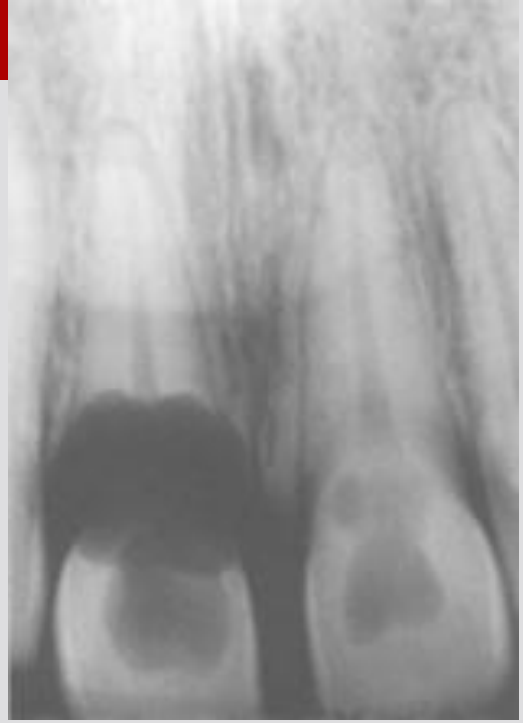
External resorption

•Periapical inflammation

• Results from the progression of dental caries, pulpitis , pulpal necrotic tissues through apical foramina

• Excessive mechanical force e.g. improper orthodontic treatment

Internal resorption



- **Occurs from the pulp chamber to the outside**

May be:

Secondary to pulpitis

Idiopathic

Clinically we start to see the pulp through enamel - pink tooth or by a radiograph

treatment

- bleaching

Composite resin restoration

COMPOSITE VENEERS

Porcelain Dental Veneers

ceramic crowns

implantation


Thanks!