Dental Anomalies

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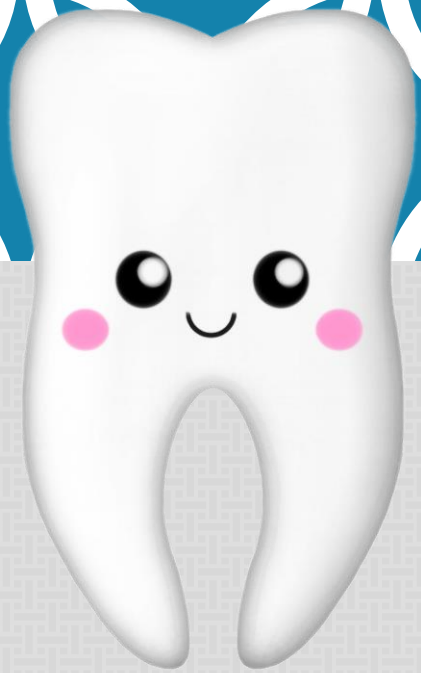

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Introduction

Developmental dental anomalies of the primary and permanent dentition occur when specific disturbances in one or more stages of odontogenesis occur during human development . Such anomalies are morphologically diverse and can be characterized as those affecting shape, number, position, and the enamel or dentin structures.

The etiology of dental developmental anomalies (or defects) is complex and can involve multiple causative agents such as local factors (e.g., trauma), genetic influences, or environmental insults (e.g., alcohol or drug exposures during the fetal period, febrile illnesses).

Classification

A classification of anomalies of the dentition is of value to the clinician seeking information useful in making a diagnosis.

I. Anomalies of number of teeth

II. Anomalies of shape of teeth

III. Anomalies of color of teeth

IV. Anomalies of structure and texture of teeth

V. Anomalies of eruption and exfoliation of teeth

VI. Anomalies of position of teeth

1- Anomalies of Number of Teeth

I. Anodontia

- Rare dental anomaly Absence of all teeth.

- missing third molars have shown this tooth to be congenitally absent in as many as 35% .

- the maxillary lateral incisors and maxillary or mandibular second premolars are commonly missing.

II. Hypodontia

- There is an absence of ≤ 6 teeth excluding third molars.
- More prevalent in women.

- The most common missing teeth are :
  - ✓Mandibular second premolar
  - ✓Lateral incisors.

III. Oligodontia

- More than six teeth are missing.
- Can be present in non syndromic or in association with syndromes
- Comprehensive prosthetic management to replace missing teeth is recommended in non-syndromic cases.

IV. Hyperdontia

- Hyperdontia is the term used to describe supernumerary teeth.

❖ supernumerary teeth,

depending on their location:

1- in the maxillary anterior incisor

region is termed a **mesiodens**.

2- an accessory fourth molar is often called a **distomolar or distodens.**

3- posterior supernumerary tooth situated lingually or buccally to a molar tooth is termed a **paramolar.**

V. Mesiodens

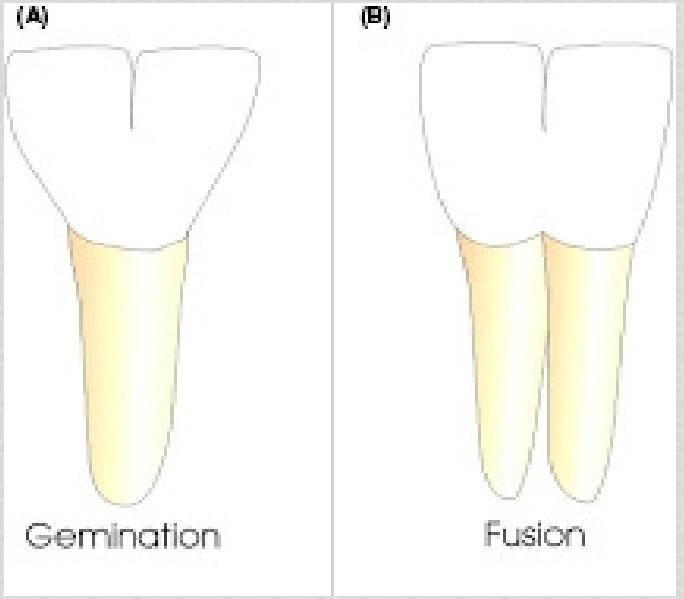
- located in the maxillary arch between two central incisors.
- In the primary dentition, it is referred to as ***supplementary mesiodens .***
- In the permanent dentition, the term used is ***rudimentary mesiodens .***

- The male population is more prone to be affected as compared to the female population.

2- Anomalies of shape and size of Teeth

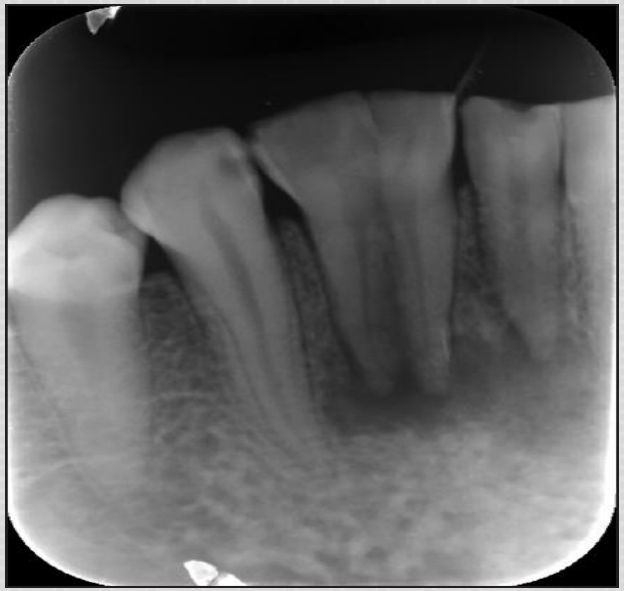
I. Gemintation

- Gemination is defined as a failed attempt at division of a single tooth germ by invagination during the proliferation stage of tooth development, resulting in a tooth with an incompletely separated crown, a singular root, and single root canal, with a shallow or deep groove .



II. Fusion

- Fused teeth arise through union of two normally separated tooth germs.
- Radiographically, these teeth would present with two separate pulp chambers and root canals and the fusion will be limited to the roots of these teeth .
- Fusion is characterized by
- the union between enamel and dentin.



III. Concresence

- Concrescence is two fully formed teeth, joined along the root surfaces by cementum.

- It is thought to arise as a result of traumatic injury or crowding or an inflammatory.

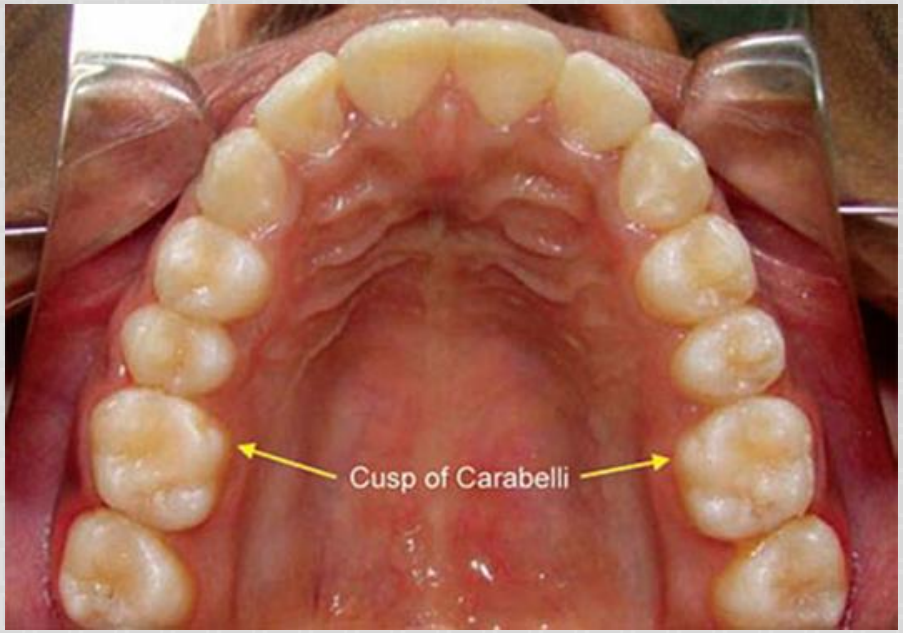
- It may also affect the extraction of an adjacent tooth and may cause fracture the tuberosity or floor of the maxillary sinus. In such cases, sectioning of tooth should be considered.

IV. Talon cusp

- a maxillary central incisor with a horn-like protuberance projecting from the lingual surface. In canines and incisors, it originates usually in the palatal cingulum
- It is composed of normal enamel and dentin and contains a horn of pulp tissue.

V. Cusp Of Carabelli

- It is a nonfunctioning cusp at mesiopalatal cusp at mesiopalatal line angle in maxillary first permanent molar , but also associated with the primary maxillary second molar
- Males are more commonly affected than females
- It is separated from mesiopalatal cusp by a groove which is also named as cusp of carabelli groove.



VI. Dens evagination

- Dens evaginatus is a rare dental anomaly involving an extra cusp or tubercle that protrudes from the occlusal surface of the affected tooth.

- The pathogenesis of the lesion is thought to be the proliferation and evagination of an area of the inner enamel epithelium and subjacent odontogenic mesenchyme into the dental organ during early tooth development.

VII. Dens invagination

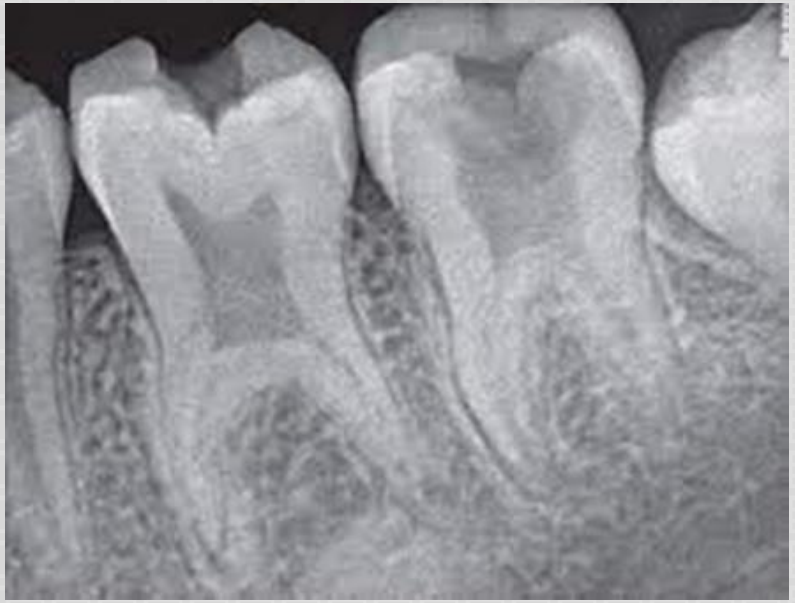
- This term refers to the presence of an invagination in the crown of the tooth, forming an infolding lined by enamel within the crown of the tooth, sometimes extending into the root.
- Maxillary lateral incisor is most commonly affected tooth.
- The more severe forms of “dens in dente” may exhibit an invagination that extends nearly to the apex of the root.

VIII. Enamel pearls

- Enamel pearl is determined as an ectopic globule of enamel that is firmly attached to the tooth root.
- Enamel pearls are found most frequently on the roots of maxillary molars.
- It appears as a yellowish white, spherical structure adherent to the furcation area of the root surface.

IX. Taurodontism

- Taurodontism is a shape anomaly that occurs due to a failure of appropriate invagination of Hertwig's epithelial root sheath. This results in the characteristic features of the anomaly – an enlarged pulp chamber, apical displacement of the pulpal floor, and lack of constriction at the cemento-enamel junction.



- Clinical complications associated with taurodontism include the greater risk for pulpal exposure.

X. Hypercementosis

- Hypercementosis is the excessive deposition of cementum on the external surfaces of the roots.
- The mandibular molars were affected most frequently.
- hypercementosis may complicate the extraction procedure because the diameter of the roots is increased relative to the cervical aspect of the alveolus.

XI. Dilaceration

- The term “dilaceration” refers to an angulation, or a sharp bend or curve, in the root or crown of a formed tooth .

- The condition is thought to be due to trauma during the period in which tooth is forming.

- Dilaceration makes a challenge for endodontic or orthodontic treatment as well as discomfort in extraction.

XII. Microdontia

- This term is used to describe teeth which are smaller than normal.
- The etiology of microdontia is related to disturbances in the process of odontogenesis and is also associated with familial inheritance patterns.
- The most frequently affected teeth are maxillary lateral incisor and third molars.

XIII. Macrodontia

- The term macrodontia (megalodontia, megadontia) should be applied only when teeth are physically larger than usual
- Occurs more frequently in permanent incisors, canines, and mandibular third molars.

3 - Anomalies of color of Teeth

I. Tetracycline pigmentation

- Tetracycline is one such group of antibiotics.
- The teeth become stained only when tetracycline is given during their development, and it can cross the placenta to stain the developing teeth of the fetus.
- Tetracyclines produce yellow pigmentation in calcifying bones and teeth.

II. Fluorosis

- Fluorosis is a cosmetic situation that affects the teeth. It is happened due to overexposure to fluoride during the first 8 years of life.
- Symptoms of fluorosis range from tiny white specks or streaks that may be unnoticeable to dark brown stains and rough, pitted enamel that is difficult to clean.

4- Anomalies of structure of Teeth

I. Amelogenesis imperfect

- Amelogenesis imperfecta is a group of conditions caused by defects in the genes encoding enamel matrix proteins.
- It may be differentiated into three main groups: hypoplastic (HP), hypocalcified (HC) and hypomaturation (HM)
- Clinical findings in AI include discolored, soft, and sensitive enamel.
- There is no treatment except for improvement of cosmetic appearance.

II. Dentinogenesis imperfect

- it is a rare dentin genetic disease. Mutations in the dentin sialophosphoprotein gene have been identified in DI types II and III.
- Affected teeth are gray to yellowish-brown and have broad crowns with constriction of the cervical area resulting in a “tulip ” shape.
- DI is classified into 3 categories:
    a) Type I DI is usually associated with OI
    b) Type II DI is usually present as a single entity
    c) Type III DI is a rare variety characterized by shell like teeth with multiple pulp exposures in primary dentition

III. Dentinal Dysplasia

- Dentin dysplasia (DD) is a condition is characterized by the presence of normal tooth enamel but atypical dentin with abnormal pulpal morphology.

- Two major patterns exist: type I and type II.
- ***Type I (radicular).*** Clinically characterized by normal teeth with reduced pulps.

- ***Type II (coronal).*** Both dentitions are also affected in this form of dentin dysplasia.

5 - Anomalies of Eruption of Teeth

I. Delayed Eruption

Eruption is the movement of a tooth from its position of development within the

bone to its functional location in the mouth Eruption of

deciduous teeth starts at about 6 months

- Eruption is considered delayed if emergence has not occurred within 12 months of the normal range or by the time 75% root formation is complete.
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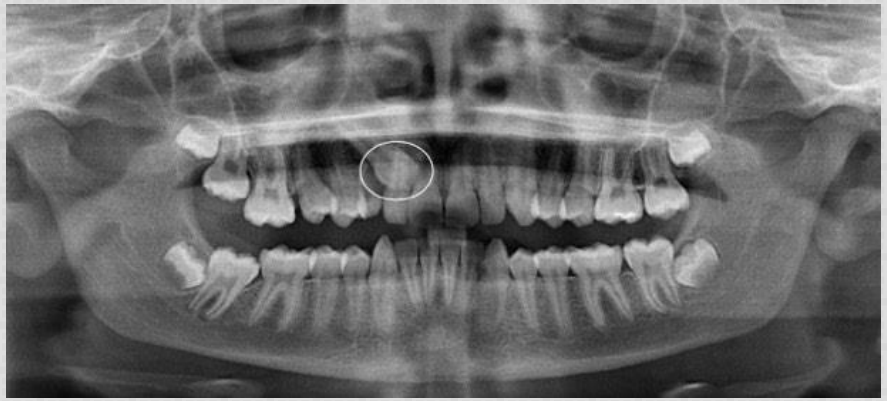
II. Premature Eruption

- Children with high birth weight, with precocious puberty, endocrine abnormalities, growth or thyroid hormones show premature eruption.
- Teeth present at birth are natal teeth and those that erupt within first month of life—Neonatal teeth .

6 - Anomalies of Position of Teeth

I. Impaction

- Impaction is defined as the inability of a tooth to erupt into the oral cavity.
- Associated systemic factors include hypothyroidism, radiation therapy, and Amelogenesis imperfecta.
- Local factors include failure of the deciduous tooth to resorb, an abnormal eruptive path, presence of supernumerary teeth, crowding, and trauma
- Some authors subdivide these nonerupted teeth into those that are obstructed by a physical barrier (impacted) and those that appear to exhibit a lack of eruptive force (embedded)



III. Ankylosis

- Ankylosis is defined as the fusion of the root (dentin or cementum) of a tooth to bone.
- traumatic dental injuries have been reported as a cause of ankylosis.
- A dull sound on vertical percussion is a characteristic of an ankylosed tooth.
- When ankylosed teeth are planned for extraction due to poor prognosis, then a referral to an oral and maxillofacial surgeon may be necessary.

CONCLUSION

Developmental dental anomalies affecting the shape, number, position, and enamel or dentinal structures of the primary and permanent teeth can impact the overall form, function, and development of the jaws. Developmental anomalies of the teeth require careful examination and treatment planning. Clinicians should understand the various types of dental developmental anomalies.


THANK YOU