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**Epstein Pearls, Bohn Nodules,**

**and Dental Lamina Cysts**

On rare occasions, small, white or grayish-white lesions on the alveolar mucosa of the newborn may be incorrectly diagnosed as natal teeth. The lesions are usually multiple, but do not increase in size . No treatment is indicated because the lesions are spontaneously shed a few weeks after birth.

These are clinically visible cysts ,are found newborn infants. Classify as the following three types of inclusion cysts:

1. Epstein pearls are formed along the mid palatine raphe. They are considered remnants of epithelial tissue trapped along the raphe as the fetus grew.

2. Bohn nodules are formed along the buccal and lingual aspects of the dental ridges and on the palate away from the raphe. The nodules are considered remnants of salivary gland tissue and are histologically

different from Epstein pearls.

3. Dental lamina cysts are found on the crests of the maxillary and mandibular dental ridges. The cysts apparently originated from remnants of the dental lamina.

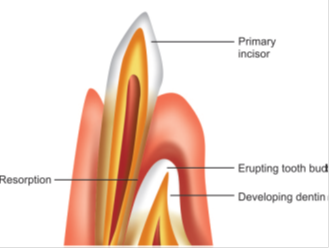
**Shedding of Deciduous Teeth**

The human dentition like those of most mammals consists of two generations. The first generation is known as the deciduous dentition and the second as the permanent dentition. The necessity of two dentitions exists because infant jaws are small and the size and number of teeth they can support is limited. Since teeth, once formed, cannot increase in size, a second dentition, consisting of larger and more teeth, is required for the larger jaws of the adult. The physiologic process resulting in the elimination of the deciduous dentition is called *shedding or exfoliation.*

**Pattern of Shedding**

The shedding of deciduous teeth is the result of progressive resorption of the roots of teeth and their supporting tissues. In general the pressure generated by the growing and erupting permanent tooth dictates the pattern of deciduous tooth resorption.

**Resorption of Anterior Teeth**

* The position of the permanent anterior tooth germ is lingual to the apical third of the roots of primary tooth hence the resorption is in the occluso-labial direction, which corresponds to the movements of the permanent tooth germ
* Later the crown of the permanent tooth lies directly apical to the root of primary tooth, which causes resorption to proceed horizontally.
* This horizontal resorption allows the permanent tooth to erupt into the position of the primary tooth.

**Resorption of Posterior Teeth**

* The growing crowns of the premolars initially are situated between the roots of the primary molars.
* The initiation is by the resorption of the inter-radicular bone followed by resorption of the adjacent surfaces of the root of primary tooth
* Meanwhile, the alveolar process is growing to compensate for lengthening roots of the permanent tooth. As this occurs, the primary molars move occlusally, this allows the premolar crowns to be more apical.
* The premolars continue to erupt until the primary molars roots are entirely resorbed and the teeth exfoliate. The premolars then appear in place of the primary molars.



**Mechanism of Resorption and Shedding**

* The exact causes of resorption and shedding of deciduous teeth cannot be underlined however three main reasons have been attributed to this which are loss of root, loss of bone and increased force.
* As permanent teeth grow they exert pressure to induce differentiation of osteoclasts and odontoclasts, which causes resorption of hard tissues and supporting structures of root.
* Osteoclasts are bone resorbing cells derived from monocyte-macrophage lineage with giant multinuclear cells with 4 to 20 nuclei. Osteoclasts cells have striated border and are housed in Howship’s lacunae which attach to the resorbing front of hard tissue and release acid phophatse. This disrupts collagen network and releases crystals which are digested by the vacuoles of osteoclasts. The disrupted collagen is then destroyed by fibroclasts . Resorption occurs at the ruffled border which greatly increases the surface area where the osteoclasts are in contact with bone.
* During the process of resorption the pressure form tooth is first directed to the bone and following its resorption the forces are directed to primary tooth.



**Remnants of Deciduous Teeth**

Sometimes parts of the roots of the deciduous teeth that are not in the path of eruption remain embedded in the jaw for a considerable time. They are most frequently found in association with the permanent premolars because the roots of the lower second deciduous molars are strongly curved or divergent. Root remnants may later be found deep in the bone, completely surrounded by and ankylosed to the bone. When they are close to the surface of the jaw, they may ultimately be exfoliated. Progressive resorption of the root remnants and replacement by bone may cause the disappearance of these remnants.

**Retained Deciduous Teeth**

Deciduous teeth may be retained for a long time beyond their usual shedding schedule. Such teeth are usually without permanent successor, or their successors are impacted. Retained deciduous teeth are most often the upper lateral incisor, less frequently the mandibular second primary molars and rarely the lower central incisors.

**Various Factors Influence the Timing of Eruption**

1. Genetic factor: Genes play a definite role in tooth eruption and have

been estimated to be about 78%.

1. Sex: It is observed that the teeth of girls erupt slightly earlier than those of boys. The average amount of tooth development for girls is about 3% ahead that of boys. The difference may vary from 2 months [first molar] to 10 months (maxillary canine). Initially during the formation stage, there was no sex difference up to the stage of calcification, and the difference begins only from the crown completion stage.
2. Socioeconomic condition: Socioeconomic levels are known to affect eruption. Retarded eruption of anterior teeth and accelerated emergences of the posterior dentition has been linked to low socioeconomic status in all racial groups.
3. Birth weight: Low birth weight has been associated with delayed emergence of permanent teeth and conversely early eruption has been associated with increased birth weight.

5.Hormons and Vitamins: Thyroid, pituitary [growth hormone], and parathyroid hormones are essential for normal eruption of teeth. Vitamins like vitamin B complex, A, C and D aid either directly or indirectly for tooth eruption.

6.disease :systemic or local

**Local Factors influence time of eruption**

1 ) Infection around the tooth : if it is : (a) near the eruption time it cause tearing of tissues and sometimes resorption in the area resulting in early eruption .( b) If the infection occur before long period of time it will result in late eruption because infection for long period will healed with fibrosis in the area which aid in late eruption ,

2 )Supernumerary tooth : may be of importance in late the eruption ,

3 ) Trauma : any trauma may cause early shedding of primary teeth , which lead to late eruption of permanent successor teeth

4 ) Gingival fibromatosis : Hereditary gingival fibromatosis ( HGF ) is characterized by a slow , progressive , benign enlargement of the gingivae , which is the most common genetic form of gingival enlargement , usually has all autosomal dominant mode of inheritance , It is also referred to as elephantiasis gingiva or hereditary hyperplasia of the gum . The dense fibrous tissue often causes displacement of the tooth and malocclusion , also it may prevent eruption of teeth and treatment usually is gingivectomy

5 ) Ankylosed teeth

It is the aberration of tooth eruption in which the continuity of the periodontal ligament has been compromised and the tooth is fused to the underlying bone. The tooth appears submerged and does not occlude

with the opposing tooth, as the ankylosed tooth is in the state of static retention whereas in the adjacent areas eruption and alveolar growth continues. There are high chances for the occurrence of many

ankylosed teeth when a patient is diagnosed to have one or two ankylosed tooth in oral cavity. Mandibular primary molars are the teeth most often

observed to be ankylosed. Ankylosis of anterior primary tooth usually follows any kind of trauma. Familial occurrences (non-sex linked) have been noted.

**Diagnosis of an ankylosed tooth can be made based**

**on the following points:**

• No contact with opposing molar

• Not mobile inspite of advanced root resorption

• Comparing the sound by taping the involved and

adjacent tooth. Ankylosed tooth exhibits solid sound,

but a normal tooth has a cushioned sound

• Break in the continuity of periodontal membrane.

**Management of ankylosed tooth**

**A.** Surgical removal, if the permanent successor is

present.

**B.** If permanent teeth are missing, functional occlusion is

established with stainless steel crowns on the affected

tooth.

Understanding tooth development and eruption will guide a practitioner to diagnose or differentiate normal from an abnormal. Constant evaluation or observation of the development of teeth and occlusion can be included

under preventive dentistry program thus intervening any developing malocclusion at its early stage.

**C.** For permanent teeth: The incomplete eruption of a permanent molar may be related to a small area of root ankylosis. The removal of soft tissue and bone covering the occlusal aspect of the crown should be attempted first, and the area should be packed with surgical cement to provide a pathway for the developing permanent tooth. Unerupted permanent teeth may become ankylosed by inostosis of enamel. This process follows the irritation of the follicular or periodontal tissue resulting from chronic infection. The close association of an infected apex with an unrupted tooth may give rise to the process. In the unerrupted tooth, enamel is protected by enamel epithelium. The enamel epithelium may disintegrate because of infection (or trauma), the enamel may may be resorbed, and bone or coronal cementum may be deposited in its place, the result is solid fixation of the tooth in its unerupted position.