

## EPSTEIN PEARLS, BOHN NODULES, AND DENTAL LAMINA CYSTS

*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.*

- 1. **Epstein pearls** are formed along the midpalatine 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 the primary teeth***

*The human dentition like those of most mammals consists of two generations. The first generation is known as the deciduous or primary dentition and the second as the permanent dentition. The need and the necessity of two dentitions exists because 1. Infant jaws are small and the size and number of teeth they can support is limited. 2. Since the 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 physiological process resulting in the elimination of the deciduous dentition is called shedding or exfoliation.***

### ***Pattern of Shedding***

*The result of progressive resorption of the roots of teeth and their supporting tissues, is the shedding of deciduous teeth. In general the*



*pressure generated by the growing and erupting permanent tooth dictates the pattern of deciduous tooth eruption.*

### ***Resorption of Anterior teeth***

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

### ***Resorption of Posterior teeth***

*Initially, the growing crowns of the premolars are situated between the roots of the primary molars and so the root resorption of the posterior primary teeth will started at the inter-radicular bone area followed by resorption of the adjacent surfaces of the root. Meanwhile, the alveolar process is growing to compensate for the lengthening roots of the permanent tooth. As this occurs, the primary molars move occlusally, which allows the premolars 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***

*It is not fully understood, however, it is clear that the pressure from the erupting successional tooth plays a key role because the odontoclasts differentiate at predicted sites of pressure. The most likely sequence of events in resorption of dental hard tissue by odontoclasts is an initial removal of the mineral followed by extracellular dissolution of the organic matrix (mainly collagen). Forces of mastication are also synergistically involved in the mechanism of shedding. Due to growth and increased loading of jaws those forces far exceed the limit that the deciduous periodontal ligament can withstand, thereby causing trauma to the ligament and initiation of resorption.*



## ***Remnants of Deciduous teeth***

*Sometimes parts 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 associated with permanent premolars because the roots of the lower second deciduous molars are strongly curved or divergent. 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***

*They may be retained for a long period of 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. If permanent tooth is ankylosed or impacted its deciduous predecessors may also be retained.*

## ***Factors causes differences in time of eruption***

- 1. Race: Negro teeth erupted earlier than white people.*
- 2. Environment: industrialized countries children erupt their teeth later than rural area because industrialized countries children eat ready food than the developing countries who eat raw food.*
- 3. Socioeconomic level: children from good socioeconomic level erupt their teeth earlier because of their good nourishment and health.*
- 4. Nutrition and growth: good nutrition lead to good growth which lead to early eruption of teeth.*
- 5. Gender: girls erupt their teeth earlier than boys.*
- 6. Disease: either systemic or local.*

## ***Local factors influence time of eruption***

- 1) Infection around the tooth: if it is: 1. near the eruption time it cause tearing of tissues and sometimes resorption in the area resulting in early eruption. 2. 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 an 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 teeth and malocclusion also it may prevent eruption of teeth, treatment usually is gingivectomy.*

5) *Ankylosed teeth: ankylosed tooth is a tooth in a state of static retention, whereas in the adjacent areas eruption and alveolar growth continue. Ankylosis should be considered an interruption in the rhythm of eruption and that a patient who has one or two ankylosed teeth is more likely to have other teeth become ankylosed. The mandibular primary molars are the teeth most often observed to be ankylosed. In unusual cases all the primary molars may become firmly attached to the alveolar bone before their normal exfoliation time. Ankylosis of the anterior primary teeth does not occur unless there has been a trauma. The cause of ankylosis in the primary molar areas is unknown. It may follow a familial pattern. There is a relationship between the congenital absence of permanent teeth and ankylosed primary teeth. Normal resorption of the primary molar begins on the inner or lingual surfaces of the roots. The resorption process is not continuous but is interrupted by periods of inactivity or rest. A reparative process follows periods of resorption. In the course of this reparative phase, a solid union often develops between the bone and the primary tooth. This intermittent resorption and repair may explain the various degrees of firmness of the primary teeth before their exfoliation. Extensive bony ankylosis of the primary tooth may prevent normal exfoliation and the eruption of the permanent successor. If ankylosis occurs early, eruption of the adjacent teeth may progress enough that the ankylosed tooth is far below the normal plane of occlusion and may even be partially covered with soft tissue. An epithelium-lined track, however, will extend from the oral cavity to the tooth. Ankylosis may occasionally occur even before the eruption and complete root formation of the primary tooth. Ankylosis can also occur late in the resorption of the primary roots and even then can interfere with the eruption of the underlying permanent tooth.*

## ***The diagnosis of an ankylosed tooth***

*It is not difficult to make, because:*

- 1. Eruption has not occurred and the alveolar process has not developed in normal occlusion, the opposing molars in the area seem to be out of occlusion.*
- 2. The ankylosed tooth is not mobile, even in cases of advanced root resorption.*
- 3. Ankylosis can be partially confirmed by tapping the suspected tooth and an adjacent normal tooth with a blunt instrument and comparing the sounds. The ankylosed tooth will have a solid sound, whereas the normal tooth will have a cushioned sound because it has an intact periodontal membrane that absorbs some of the shock of the blow*
- 4. The radiograph is often a valuable diagnostic aid. A break in the continuity of the periodontal membrane, indicating an area of ankylosis, is often evident radiographically*

## ***Management of an ankylosed tooth***

*Early recognition and diagnosis are extremely important.*

- 1) The eventual treatment may involve surgical removal. However, unless a caries problem is unusual or loss of arch length is evident, the dentist may choose to keep the tooth under observation.*
- 2) A tooth that is definitely ankylosed may at some future time undergo root resorption and be normally exfoliated. When patient cooperation is good and recall periods are regular, a watchful waiting approach is best.*
- 3) For primary teeth: In situations in which permanent successors of ankylosed primary molars are missing, attempts have been made to establish functional occlusion using stainless steel crowns, overlays, or bonded composite resins on the affected primary molars. This treatment is successful only if the eruption of permanent teeth are still in state of active eruption they will be seen by pass the ankylosed tooth.*
- 4) 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 unerupted tooth may give rise to the process. In the unerupted tooth, enamel is protected by enamel epithelium. The enamel epithelium may disintegrate as a result of infection (or trauma), the enamel may subsequently 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.*