Dr. Al-Hussein Ali

Second stage - Al Ameed University

College of Dentistry 2024-2025

Shedding of primary teeth

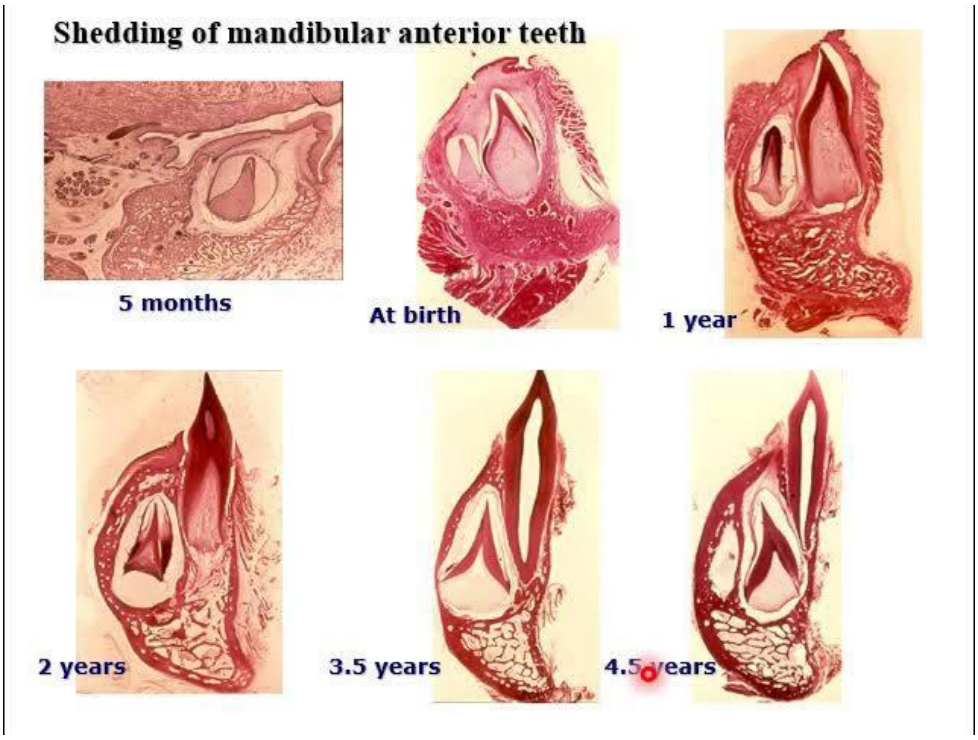
Shedding is the physiological elimination of primary teeth, prior to the eruption of permanent successor, due to resorption of their roots at specific ages. As the primary teeth are shed, the crowns of permanent successors are close to the surface, ready to emerge.

Patterns of the shedding

The shedding of deciduous teeth is the results of progressive resorption of the roots of the teeth and their supporting tissues; this is achieved by multinucleated cells called odontoclasts. The pressure generated by the growing and erupting permanent teeth dictate the pattern of shedding.

1. **Anterior teeth**:

   The pressure is directed against the root surface itself result in resorption of incisors and canine's roots at their lingual surfaces, later the developing permanent tooth germs occupy a position apical to the deciduous tooth in such cases the resorption of deciduous roots proceeds in transverse planes thus allowing the permanent tooth to erupt in late position of deciduous tooth. However, this apical position of the tooth germ does not occur and the permanent tooth erupt lingual to the still functioning deciduous tooth.



2. Posterior deciduous teeth

Resorption of deciduous molars first begins on their inner surface of the roots because the early developing bicuspids are found between them. However, as a result of continued growth of the jaw and occlusal movement of deciduous molars the permanent tooth germs of premolars come to the apical side of deciduous molars and the area of early resorption is repaired by cementum-like substance, thus when the bicuspids begin to erupt, resorption is again initiated apically until the roots are completely lost and the tooth is shed.

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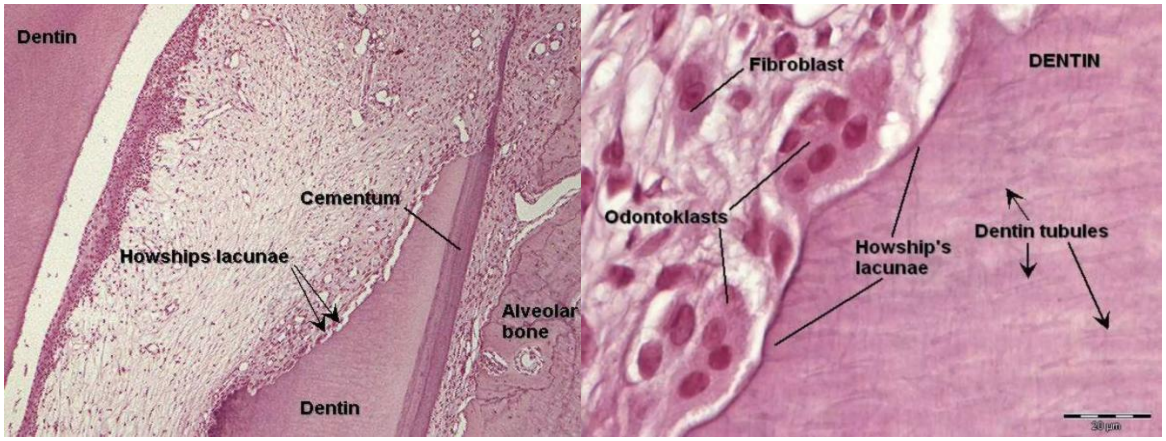
Histology of resorption

The cells responsible for removal of hard tissue of the tooth are odontoclasts. They could be of two types:

i. Cementoclasts for resorption of cementum.
ii. Dentinoclast for resorption of dentin of the root.

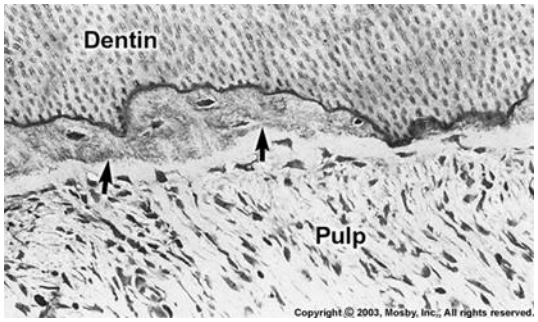


The odontoclasts are originated from circulating monocytes as do the osteoclasts. The odontoclasts are large cells occupying resorption bays on the surface of hard tissue called Howship's lacuna. Their cytoplasm is vacuolated and the surface of the cell adjacent to the resorption site form ruffled border.

Different resorption patterns exist for different teeth; for example, single rooted teeth are usually shed before root resorption is completed, therefore odontoclasts are not found within the pulp chamber of these teeth.

In the molars the roots are usually completely resorbed and the crown is also partially resorbed, when this happen the odontoblasts is replaced by odontoclasts.

The process of tooth resorption is not continuous process since there are period of rest and period of repair; however, in the long-term resorption predominate over repair.



Mechanism of shedding:

The following factors are responsible for promotion of the process of resorption which leads to the shedding of deciduous teeth:

i. The pressure from erupting permanent teeth plays a key role for the differentiation of odontoclasts. The odontoclasts appear at the site of pressure.

ii. The action of odontoclasts on the site of resorption.

iii. The forces of mastication applied on the deciduous teeth are able to initiate the resorption. Normally the force of muscles of mastication is increased as the person grows up, thus a greater pressure is applied on the teeth and their supporting tissue especially the PDL. Usually, the PDL of deciduous teeth cannot withstand such increasing rate of force of mastication. This lead for the initiation of resorption.

The resorption of hard tissue (cementum and root dentin) is accompanied by resorption of dental soft tissue (pulp and PDL). In the PDL apoptotic cell death involving the fibroblasts has been demonstrated. Usually, the remaining pulp tissue inside the shed teeth still vital and dot not die. Early degeneration of the pulp leads to the delay of shedding.

Clinical consideration:

1. **Remnants of deciduous teeth:** Sometimes fragments of the roots of deciduous teeth are not in the path of resorption. Such remnant is consisting of dentin and cementum may remain embedded in the jaw. These remnants are frequently found in region of lower second permanent premolars because their mesiodistal diameter is less than the root of the second molars; no extraction is needed.

The fragments may be exfoliated if they are near the surface of the jaws, or they may undergo resorption and become replaced by bone and disappear.

2. **Retained deciduous teeth:** Deciduous teeth may be retained for a longer time beyond their usual shedding time. **Causes:**

i. Missing of permanent successor.
ii. Ankylosed or impacted permanent successor.
iii. Supernumerary tooth or odontogenic tumor may prevent the eruption of one or more of permanent teeth.

Retained deciduous teeth are most often the upper lateral deciduous incisor, and less frequently the second deciduous molars and rarely the central incisor.

3. **Submerged deciduous teeth:** Trauma may result in damage either to dental follicle or to the developing PDL. If this happens the eruption of the teeth stops and becomes ankylosed to the bone of the jaw. Because of continued eruption of neighboring teeth and the increased height of alveolar bone, the ankylosed tooth may be either shortened or submerged in alveolar bone. The “submerged tooth “prevents eruption of the permanent successor.

Causes:

i. Infection or trauma to the tooth
ii. When the repair process exceeds over the resorption during shedding.
iii. Congenital missing of the permanent successor.