

Development of Dentition

Dental occlusion undergoes significant changes from birth until adulthood and beyond, these dental relationship changes can be divided into four stages:

- ✓ Pre dental, Gum pads stage (mouth of the neonate): 0 to 6 months.
- ✓ Deciduous or primary dentition stage: 6 months- 6 years.
- ✓ Mixed dentition stage: 6-12 years.
- ✓ Permanent dentition stage: 12 years and beyond.

Gum pads stage (0 to 6 months):

The gum pads stage extend from birth up to the eruption of first primary tooth, usually the lower central incisors at around 6-7 months.

Characteristics features:

- ✓ The mucous membrane of both the maxilla and mandible is thickened in a new born to produce gumpads. The gum pads in the maxillary and mandibular arches show elevations and grooves that outline the position of the various primary teeth that are still developing in the alveolar processes. Transverse grooves separate the gum pads into 10 segments. The groove between the canine and the first molar region is called the lateral sulcus, which helps to judge the inter-arch relationship.
- ✓ The labial frenum usually attached to the incisive papillary region, after the eruption of the deciduous teeth it will migrate in upward direction.
- ✓ Infantile anterior open bite :The anterior segment of the upper and lower gum pads do not approximate each other with a space created between them, while the posterior segment occlude with each other at the molar region. Tongue protrudes anteriorly through this space during suckling. The infantile open bite is transient and self-corrected with the eruption of primary teeth. The anterior opening of the mouth will facilitate the feeding process without discomfort to the mother.
- ✓ Complete overjet: The maxillary gum pad is usually larger and overlaps the mandibular gum pads both horizontally and vertically. In this way, the opposing surface of the gum pad: provides an efficient way of squeezing milk during breastfeeding.
- ✓ Mandibular functional movements are mainly vertical and to a little extent

antero-posterior. Lateral movements are absent.

Natal and Neonatal teeth:

The newly born child's mouth is usually without teeth except, sometime, a natal or the neonatal teeth. If present at birth are called **natal teeth**, and if it erupted within 30 days of life are called as **neonatal teeth**; these teeth are almost always mandibular incisors, which frequently display enamel hypoplasia, sometimes they consist of keratinized tissue. There are familial tendencies for such teeth. They should not be removed if they were normal, however they should be removed if they were supernumerary, mobile, or cause trauma to the mother during breast feeding.

The deciduous dentition stage: (6 months-6 years):

The deciduous dentition stage starts from the eruption of the first deciduous tooth usually the deciduous mandibular central incisors and ends with the eruption of the first permanent molar. By 2.5 years of age, the deciduous dentition is usually completed and in full function. Root formation of all deciduous teeth is usually completed by 3 years of age.

Characteristic Features:

✓ Developmental/physiological spaces: Interdental spacing is an important feature of deciduous dentition. Spacing is usually seen in the deciduous dentition to accommodate larger successor permanent teeth in the jaws. There are two types of spacing:

- *Generalized:* Usually present throughout the primary dentition, it is needed for the permanent teeth to erupt into an uncrowded position and for the establishment of their proper alignment.

- *Primate/Anthropoid Spaces:* This space is presented mesial to the maxillary canine and distal to the mandibular canine. Such spaces are a normal feature of the permanent dentition in the higher apes and in the human primary dentition. Thus these are usually referred to as the anthropoid spaces.

✓ Incisor relationship: shows increased overbite due to the fact that primary incisors are more vertically placed than the permanent incisors. However it is self-corrected by subsequent attrition of incisors, the eruption of deciduous molars, and by growth of the alveolar processes of the jaws.

✓ Overjet: The deciduous dentition shows increased overjet which usually gets corrected later by forward growth of the mandible.

✓ straight / flush terminal plane molar relation:

The molar relationship in the primary dentition can be classified into 3 types:

- ❖ Flush terminal plane: when the distal surfaces of the maxillary and

mandibular deciduous second molars are in the same vertical plane, this is the ideal molar relationship in the primary dentition because the mesiodistal width of the mandibular molar is greater than the mesiodistal width of the maxillary molar. Flush terminal plane develops into a class I.

❖ Mesial step. Distal surface of mandibular deciduous second molar is mesial to the distal surface of maxillary deciduous second molar, it usually develop into a class I relationship, however few cases may also progress to class III molar relation, if forward growth of the mandible persist.

❖ Distal step: Distal surface of mandibular deciduous second molar is more distal than the distal surface of maxillary deciduous second molar, usually it leads to class II molar relationships in the permanent dentition.

Note: Determining the terminal plane relationship in the primary dentition is of great importance because it determines the molar relationship in the permanent dentition as the erupting first permanent molars are guided by the distal surfaces of the second primary molar.

Eruption timing and sequence of the deciduous dentition

Usually the deciduous teeth begin to erupt at the sixth months of age until 2.5 - 3 year of age. (All the deciduous teeth will be erupted, completely, at the age of three years).Eruption sequence can be seen by the table below:

<i>Tooth</i>	<i>Time in Months</i>
Lower As	6 th months
Lower Bs	7 th months
Upper As	8 th months
Upper Bs	9 th months
Lower Ds	12 th months
Upper Ds	14 th months
Lower Ces	16 th months
Upper Ces	18 th months
Lower Es	20 th months
Upper Es	24 th months

Note: The first sign of the formation of the deciduous teeth is at the age of 4-6 months intra uterine life, and their roots will be completely formed after 12-18 months after their eruption.

Changes that is Happened in Deciduous Dentition

The spaces of the deciduous teeth try to increase with age due to the growth of the jaws in: anteroposterior, transverse and vertical direction, and due to: attrition; since the shape of the deciduous teeth is triangular and these teeth will be subjected to a great amount of attrition due to wear at the incisal edges; so, the spaces will be increased, especially anteriorly due to the attrition. This attrition will occur at the incisal edges and the proximal surfaces since the deciduous teeth mostly converted into edge to edge relationship at a later stage. At the age of 5.5 -6 years the permanent teeth begun to erupt, and these teeth contains an eruptive cyst, and this is filled with fluid, this fluid will exert a pressure on the roots of the deciduous teeth causing their resorption with the aid of special enzyme which is produced at this stage of age.

The roots resorption of the deciduous teeth means decrease in the root length and since the occlusal forces at the age of 5-6 years are more than those of 3 years; so, these occlusal forces together with the root resorption will increase the mobility of the deciduous teeth and if the deciduous teeth in closed case (without spacing), this will produce attrition of the proximal surfaces due to friction produced by movement during mastication, as the mobility progress the spaces will be increased and this will facilitate the process of normal shedding of the incisors.

Usually, the permanent teeth when erupt, they are located at the palatal or lingual aspect of the deciduous incisors, causing their resorption during eruption, but sometimes, the permanent teeth could be deflected from the roots of incisors; therefore, this process will not happen in the normal way, and the permanent erupt, while the deciduous is stay in its space.