Orthodontics
Development of Occlusion

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• Introduction.
• Developmental Stages of Occlusion:
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  • Primary dentition Stage.
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• Abnormalities of occlusion of primary teeth.

Introduction:
What is Occlusion?

In its simplest definition, occlusion is the way the maxillary and mandibular teeth articulate. In reality, dental occlusion is much more complex relationship because it involves the study of the teeth, their morphology and angulations, the muscle of mastication, the temporomandibular joint and the functional jaw movements.

According to Salzmann & Gregory: "The changing interrelationship of the opposing surfaces of the maxillary & mandibular teeth which occur during movements of the mandible & terminal full contact of the maxilla & mandibular arches."

According to Angle: "Occlusion is the normal relation of the occlusal inclined planes of the teeth when jaws are closed".

Occlusion is the sum total of many factors such as:
• Genetic,  ● Environmental,  ● Muscle pressure

Occlusion Changes with:  ● Development,  ● Maturity,  ● Aging.
Developmental Stages of Occlusion:

1. Pre-dental Stage. (Gum Pads stage) (At birth):

   The gum pads stage of the dental development extends from birth until the eruption of first primary tooth, usually a mandibular central incisor, around 6 to 7 months of age. 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 ridges.

   The maxillary and mandibular gum pads have been frequently illustrated to describe an anterior open bite relationship while the posterior segments are touching. More often, the maxillary gum pad slightly overlaps the mandibular gum pad both horizontally and vertically. In this manner the opposing surfaces of the pads provide for a more efficient way of squeezing milk during breastfeeding.

   The pads get divided into a labio/buccal and a lingual portion which differentiates later. 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 Maxillary gum pad is horse shoe shaped and shows:
     • Gingival groove: Separates gum pad from the palate.
     • Dental groove: Starts at the incisive papilla, extends backward to touch the gingival groove in the canine region and then moves laterally to end in the molar region.
     • Lateral sulcus.
The **Mandibular gum** pad is U-shaped and rectangular, characterized by:

- Gingival groove: Lingual extension of the gum pads.
- Dental groove: Joins gingival groove in the canine region.
- Lateral sulcus.

**Relation of gum pads:**

1. **Anterior open bite** is seen at rest with contact only in the molar region. Tongue protrudes anteriorly through this space. The intermaxillary space closure, occurs with eruption of primary teeth, thus it is a self-correcting anomaly of the developing dentition.

2. **Complete overjet.**

3. **Class II pattern** with the maxillary gum pad being more prominent.

4. **Mandibular lateral sulci** posterior to maxillary lateral sulci.

5. **Mandibular functional movements** are mainly vertical and to a little extent anteroposterior. 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, these teeth look like the deciduous teeth that are contained; enamel, dentin, and pulpal tissue and usually without roots or there is a root with them (however it is very short). The other types of neonatal teeth consist of keratinized tissue and usually develop in the lower jaw, their extraction is not necessary unless they produce trauma to the mother breast during suckling (feeding).

Occasionally a child is born with teeth already present in the mouth. Natal teeth are present at birth whereas neonatal teeth erupt during the first month. Pre-erupted teeth erupt during the second or third month. The incidence of natal and neonatal teeth is estimated to be 1:1000 and 1:30000 respectively. These teeth are almost always mandibular incisors, which frequently display enamel hypoplasia. There are familial tendencies for such teeth. They should not be removed if normal but removed if supernumerary or mobile.