

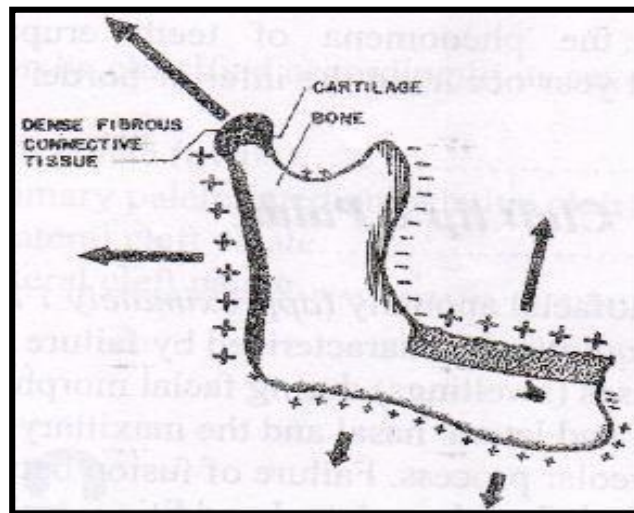
# ORTHODONTIC

## Lec. 4

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### *Mandibular growth*

The mandible is a bone of membranous origin but there are secondary cartilages that develop in it. At birth the mandible consist of two hemimandible separated by sympheseal suture. The condylar cartilage will persist for long time but the coronoid cartilage and the cartilage of the angle of the mandible will disappear early and play no role in the mandibular growth. The sympheseal suture will disappear at two years of age. The condylar cartilage will contribute in the vertical and anteroposterior growth. The increase in size is due to apposition and resorption phenomena.



#### *a- trasversal growth:*

After the first year, the sympheseal cartilage does not play any more role in the growth, only the apposition and resorption phenomena continue to manifest but they stop early, only the alveolar borders show thickening which accommodate the roots of the permanent teeth, in fact the increase in transverse dimension of the mandible result from its vertical growth because of its divergence toward the posterior, the trasversal growth is therefore sensitive in the posterior part, particularly at the condyles which are more away from each other following the transversal growth of the cranial base.

### ***b- antero-posterior growth:***

1- ramus of the mandible: it result in important apposition on its posterior border and resorption on the anterior border but less rapid than the apposition in a way that the ramus will move backward and become more thick.

2- body of the mandible: the resorption of the anterior border of the ramus will increase the antero-posterior dimension of the body of the mandible. So the inferior part of the ramus is therefore incorporated progressively in the body also an osteal apposition occurs during the first year of life particularly at the mental symphysis.

### ***c- vertical growth:***

1- ramus of the mandible: at birth the ramus is very short, its size depending on the activity of the condylar cartilage that determines the vertical dimension in the same time as the total length of the mandible.

2- body of the mandible: the vertical growth of the ramus will move away the body of the mandible from the maxilla in the space that is liberated there through the development of the alveolar process by osteal apposition jointly with the phenomena of teeth eruption. Little apposition during the first year occurs at the inferior border of the body of mandible.

## ***Cleft lip and palate***

The most common craniofacial anomaly, caused by failure of fusion between certain embryological processes during facial morphogenesis. Failure of fusion between the medial and lateral nasal and the maxillary processes results in a cleft of the lip and/or alveolar process.

Failure of fusion between the lateral palatine processes results in a cleft of the palate.

The etiology of cleft lip and palate is thought to be multifactorial. Genetic is implicated in 20%-30% of the patients. Environmental factors that have been shown in experimental animals to result in clefting include nutritional deficiencies, radiation, several drugs, hypoxia, viruses, and vitamin excesses or deficiencies. In complete or bilateral



clefts of the lip, alveolus and palate, the maxillary arch typically is collapsed in the transverse direction, especially in the area of the cleft. The maxillary permanent lateral incisors may be congenitally missing or malformed, and many atypically shaped supernumerary teeth may be present in the area of the cleft.

### **Classification:**

A cleft can be complete or incomplete, and it can occur unilaterally or bilaterally. A useful classification divides the anatomy into primary and secondary palates. An individual thus may have clefting of the primary palate, the secondary palate, or both.

Cleft lip is classified either unilateral or bilateral and it could be minor cleft of the lip (small notch in the upper lip) or increase in the severity to complete cleft of the upper lip or continue to reach the nostril or to the internal angle of the eye, mostly unilateral, sometimes cleft lip may include cleft of the alveolar ridge.

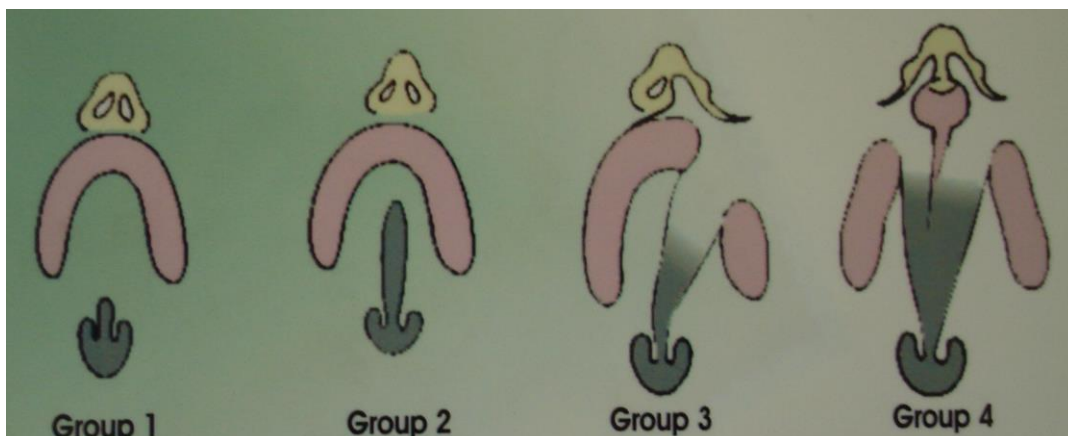
Cleft palate: the fusion of the palatal components that form the palate usually start from the anterior aspect and continue posteriorly so that cleft palate could happen at any site through this process of fusion. Cleft palate can be classified according to its severity as follows:

Class I : Cleft of soft palate (uvula)

Class II : Cleft of the secondary palate ( median palatine cleft )

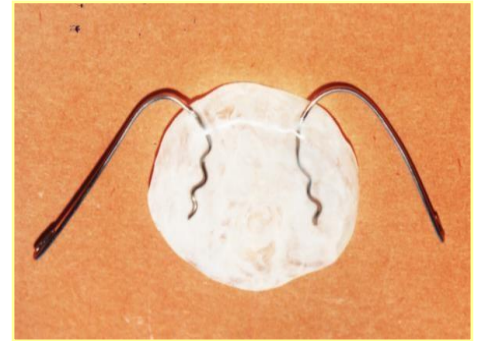
Class III: Complete unilateral cleft palate

Class IV: Complete bilateral cleft palate



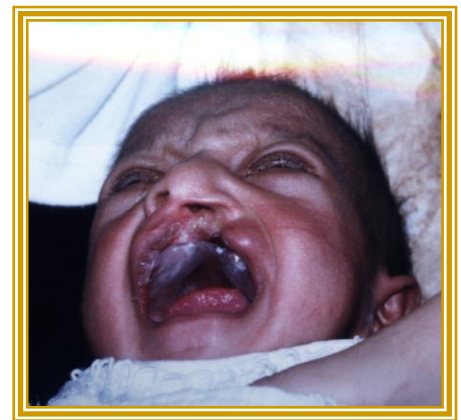
## Treatment

Treatment of cleft lip and palate must be started as soon as possible after birth because of its physiological effect on the infant since it interferes with the natural feeding process, and its psychological trauma to the parents, this treatment of patients with cleft lip and / or palate is a long and involved process, requiring many stages of intervention by many different specialists, forming a cleft lip and palate team.



The involvement of the team, orthodontist starts a few days after the baby was born, with presurgical infant orthopedic treatment if applicable, ( construction of baby feeding plate which assists the infant to suck and swallow the milk properly ).

Baby feeding plate is a piece of acrylic that disconnect between the oral and nasal cavities which are opened to each other through the cleft palate. This plate has advantage to help the two pieces of the palate to approximate toward each other ( orthopedic movement ).



Repair of the lip usually is performed within the first three months after birth, and the palate subsequently is repaired within the first year. The scar tissue created from these and other surgical procedures is considered responsible for variable degrees of maxillary growth inhibition which is commonly seen during subsequent growth.

When the cleft involves the alveolar process, a bone graft may be necessary to restore the alveolar anatomy. Alveolar bone grafting usually is performed prior to the eruption of the permanent maxillary canine on the side of the cleft.

*Phase I* of orthodontic treatment, in preparation for the alveolar bone graft, may consist of expansion of the constricted maxilla and correction of any cross bites. Following alveolar bone grafting, and when the patient is in the permanent dentition, *phase II* of orthodontic treatment is performed to idealize the occlusion, or if a severe skeletal discrepancy is present, to prepare the arches for orthodontic surgery.

*GOOD LUCK*