

Post natal growth of maxilla :

Mechanisms and areas of growth :

1- Cartilaginous growth :

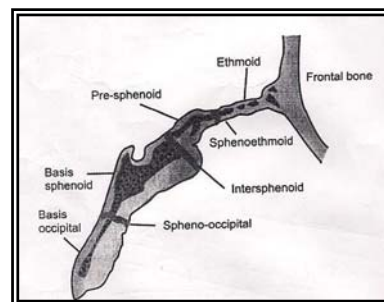
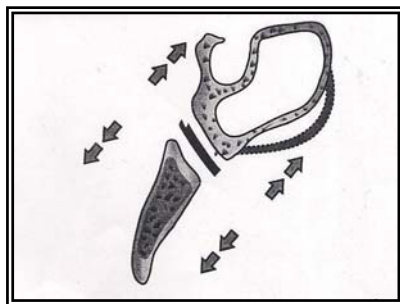
The growth of cartilage by division of chondroblast cells with progressive conversion to bone :

A/ At the base of the skull (spheno – occipital synchondroses) would increase the antero-posterior dimension of the skull base.

B/ In the area of nasal septum would bring the nose forward from original position .
under The front of the cranium .

C / in the condyle of mandible which increase the length and height of mandible

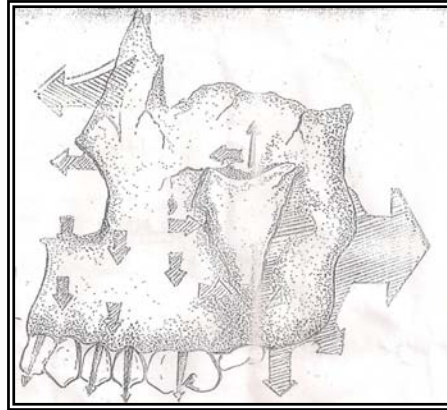
- The age in which this growth is disappear is about 10 years of life



2-Sutural growth :

The bony sutures of the head capable of increasing the size of head in all dimension . These sutures are aligned so that growth at these sutures would move the face in a forward and downward direction in relation to the cranium .

sutural growth is active in bringing the bones into close proximity . sutural growth must be active at the same time of main enlargement of the cranium that is up to 6 or 7 years of age , an example on sutural growth is symphysis area (end at 3 years of life) and inter – maxillary suture .

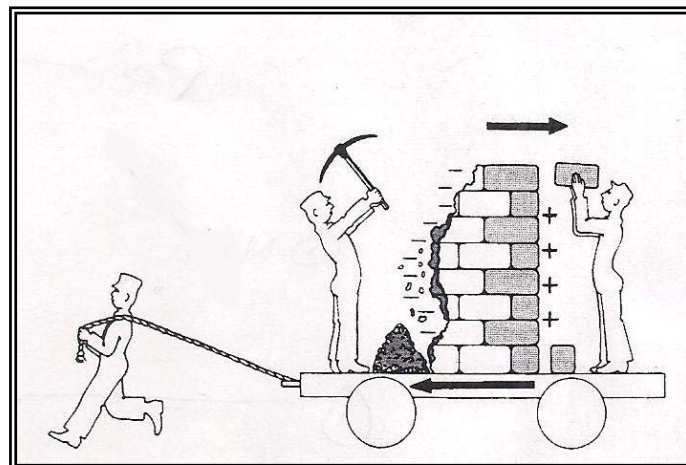


3-Periosteal and endosteal growth :

The apposition of bone on the periosteal surfaces enlarge the head in all dimension , but this will increase the thickness of bone therefore concomitant resorption of bone is necessary in order to (obtain the appropriate thickness and strength) :

1/ Periosteal :is Extensive remodeling of bones, which involve resorption of bone from the outer surface and apposition of bone on the inner surface .

2/ Endosteal resorption and addition of bone from within the cancellous spaces is also necessary to maintain the appropriate , thickness of the cortical layer of bone , this method of growth is the most active type of growth in the skull and jaws after the first few years of life , when cartilaginous and sutural growth slows , and it continue through the life .



4- Functional matrix growth :

Each part of the skull will grow by the stimulation of tissue matrix :

1- the vault of the cranium will grow by the stimulation of growing brain .

2- the orbital cavity will grow by stimulation of growing orbit .

3- the growth of the mandible can also be stimulated by the growth of the tongue .

4- alveolar bone growth can be stimulated by development and eruption of teeth .

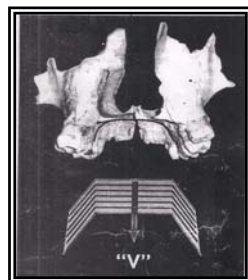
The Maxilla :

The maxilla develops postnatally entirely by intramembranous ossification . Since there is no cartilage replacement , growth occurs into two ways :

1- Sutural growth :

A/ Trasversal growth :

by apposition of bone at the sagittal sutural such as inter nasal suture , their activity decrease at the end of the first year but they continue forming osteal tissue for a long period also apposition of bone at the external aspect of the maxilla on both sides at the premolar regions by surface remodeling , Additive growth on the free ends increase the distance between them , The buccal segment move downward and outward , as the maxilla itself is moving downward and forward , owing the principle of expanding . “ V “ .

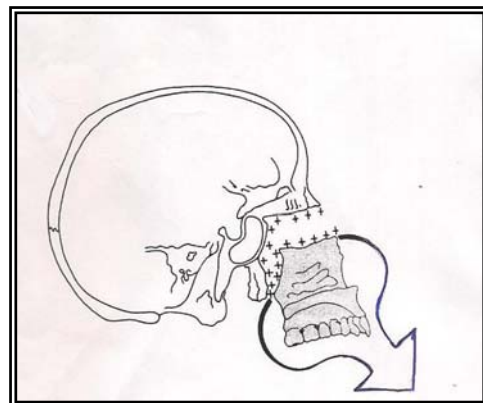
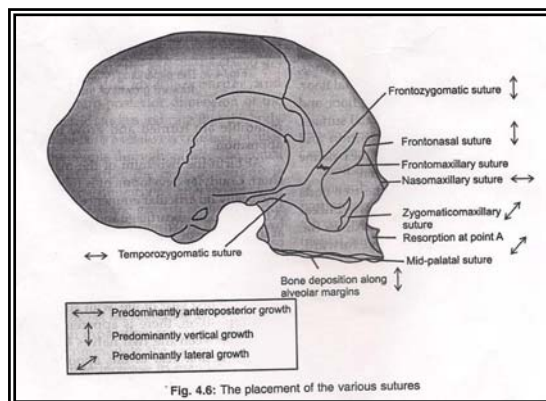


B/ Vertical and antero - posterior growth :

Apposition of bone: at the sutures that connect the maxilla to the cranium and cranial base such as :

(Tempo – Zygomatic) , (Maxillo – Zygomatic suture) , (Pterygo – Palatine suture) (Fronto – Maxillary suture) .

These are parallel to each other and they orient the direction of the facial growth downward and forward .



2- Surface remodelling :

A- Vertical growth : include :

1- Alveolar process : the formation of alveolar process by apposition of bone on three aspects (inferior , internal , external) in posterior region and on two aspect (internal , inferior) in the anterior region .

2-Palate : there will be resorption on the superior aspect (nasal) and apposition on the inferior aspect (oral) which will bring the palate downward .

B- Antero – posterior growth : Occurs by :

1- anterior alveolar growth , resorption in the vestibular part and apposition on the inferior and palatal part .

2- an apposition on the posterior aspect of the horizontal part of the palate .

3- development of the tuberosity .

Maxillary Sinus :

As the sinus has the volume of small peas , the eruption of deciduous teeth will modify its volume and it increase in size with the eruption of upper six , about 8 years it has a pyramidal form that will lengthen after the eruption of the canine and the last molar .

References :

1- Text book of orthodontics , second edition 2007 , Gurkeerat Singh, BDS , MDS (ortho) , M . Ortho (RCS London) , RCPS Glasgow.

2- contem porary orthodontics , third edition , William R. Proffit , DDS, PHD , with Henry W.Fields , JR , DDS , MS , MSD .