Pharyngeal (Branchial) Apparatus

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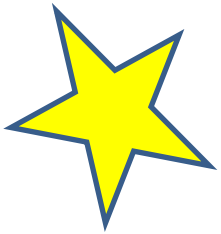
Derivatives of first pharyngeal arch

Maxillary process forms:

1. Lower part of temporal bone
2. Zygomatic bone
3. Maxilla

Mandibular process forms Meckel's cartilage



Meckel's cartilage

- Ventral part
  - Ramus of mandible
- Middle part
  - 1- Anterior ligament of malleus
  - 2- Sphenomandibular ligament
- Dorsal part
  - 1- Malleus
  - 2- Incus

N.B The rest of the mandible is formed by intramembranous ossification

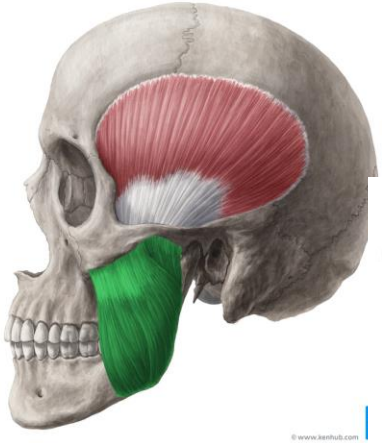
Muscles of first pharyngeal arch:

Are the muscles supplied by the **mandibular nerve**:

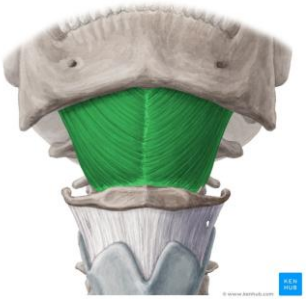
1. Muscles of mastication
2. Tensor tympani
3. Anterior belly of digastric
4. Mylohyoid
5. Tensor veli palatini

The nerve supply to the muscles of the first arch is provided by the mandibular branch of the trigeminal nerve Since mesenchyme from the first arch also contributes to the dermis of the face, sensory supply to the skin of the face is provided by ophthalmic, maxillary, and mandibular branches of the trigeminal nerve.

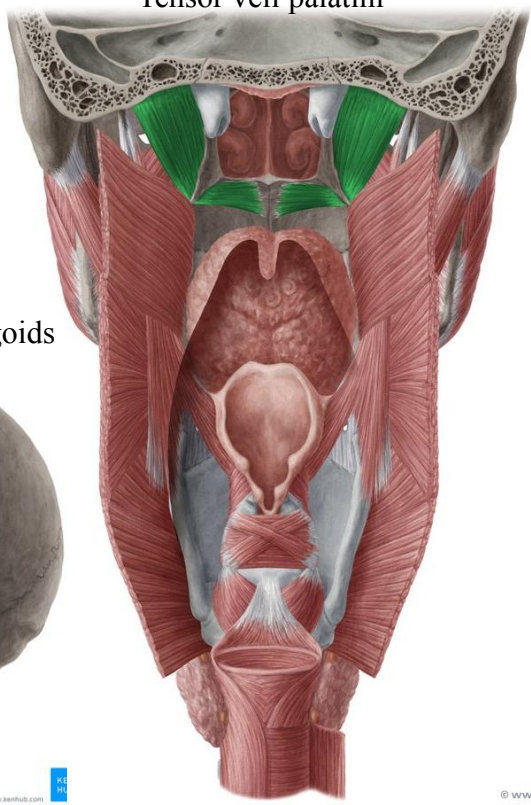
Masseter & Temporalis



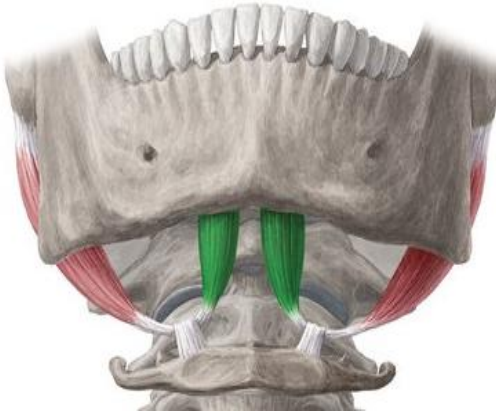
Mylohyoid



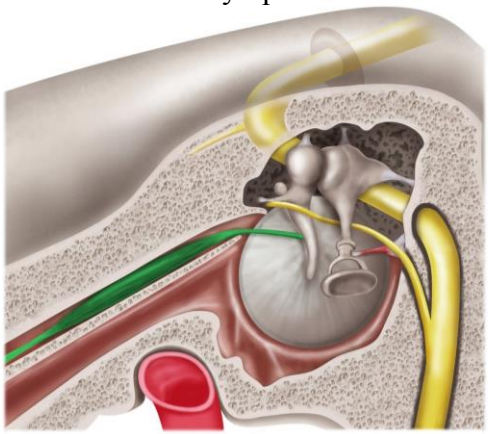
Tensor veli palatini



Anterior belly of digastric



Tensor tympani



Medial & Lateral pterygoids

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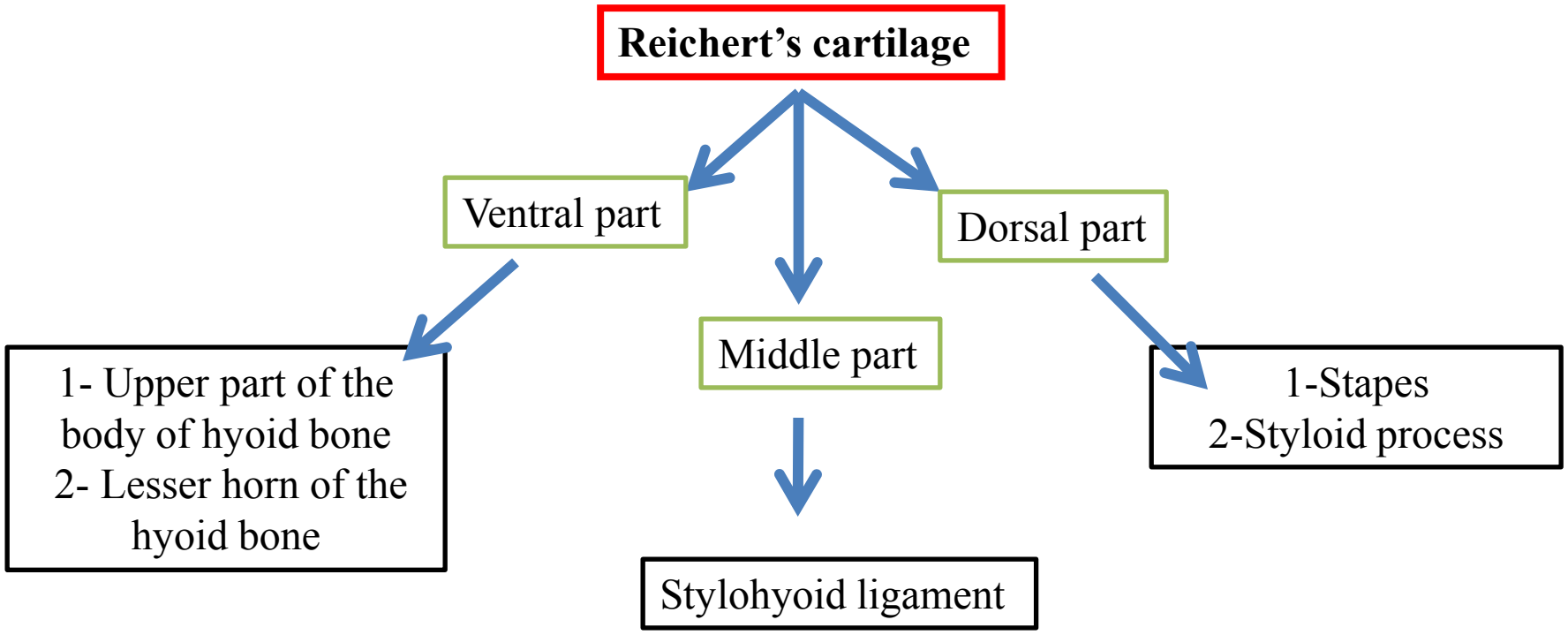
Derivatives of second pharyngeal arch

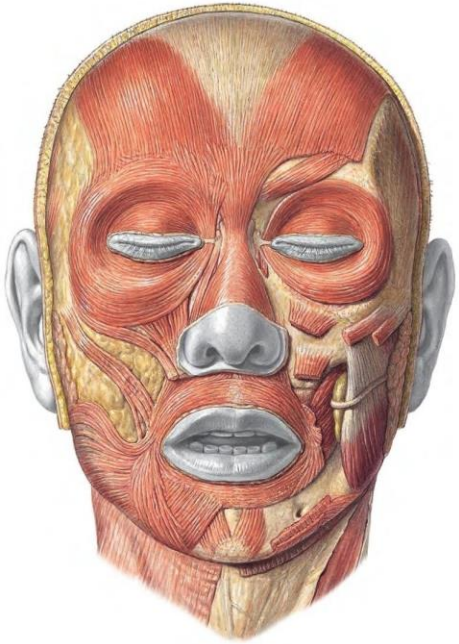
The cartilage of the **second or hyoid arch (Reichert's cartilage)**



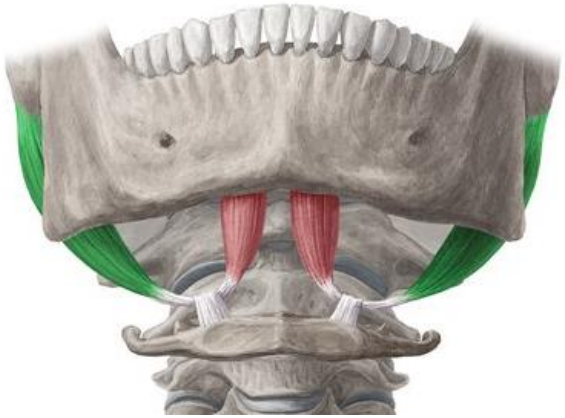
Muscles of second pharyngeal arch:
Are the muscles supplied by the **facial nerve** :

1-Muscle of facial expression
2- Stapedius
3- Stylohyoid
4-Posterior belly of the digastric

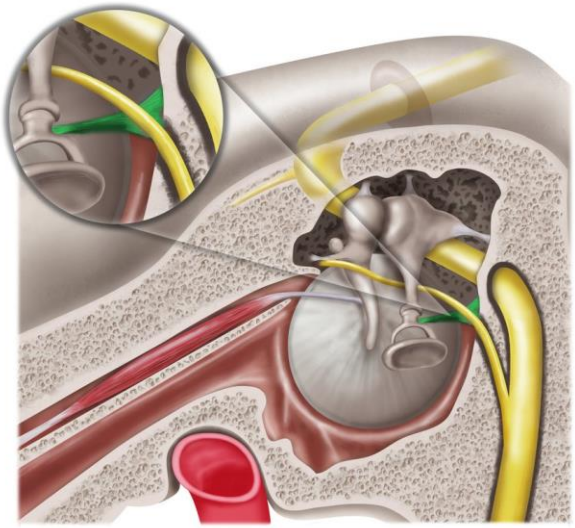
Muscle of facial expression



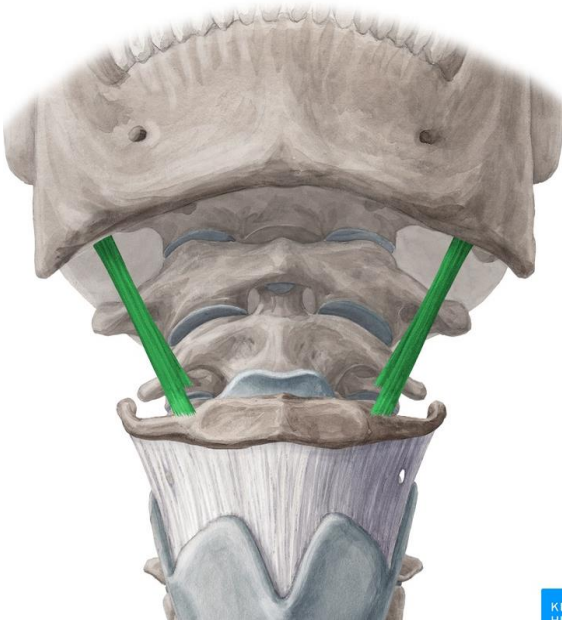
Posterior belly of the digastric



Stapedius



Stylohyoid

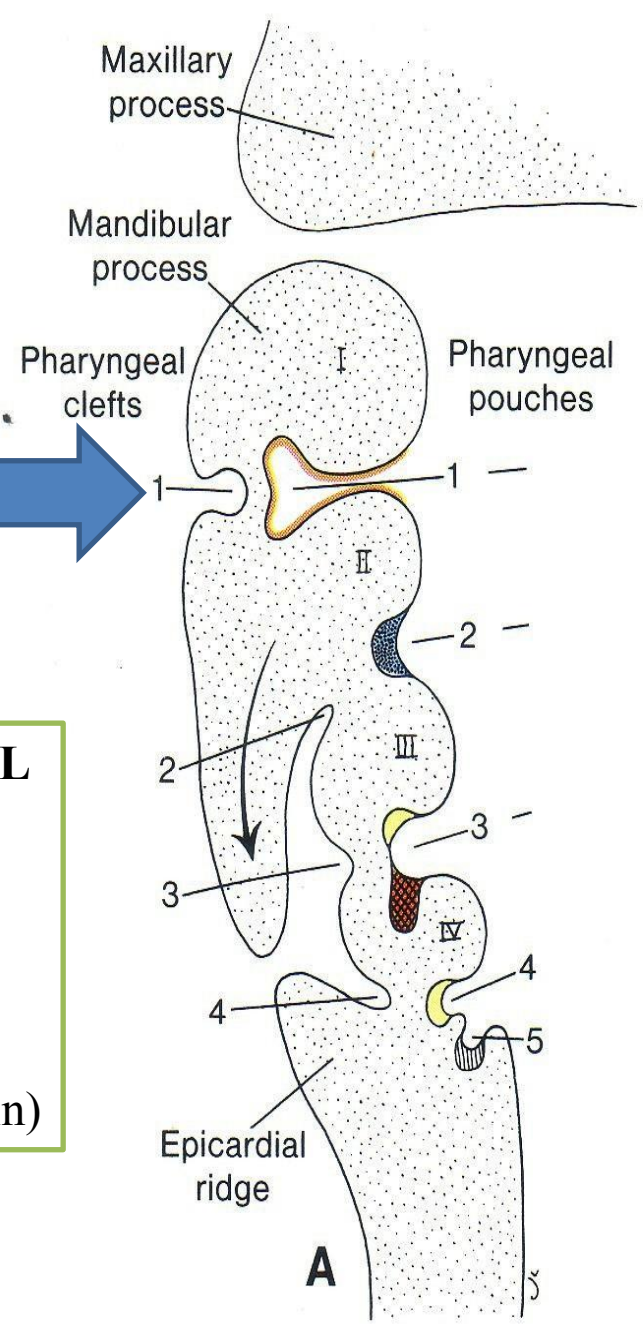


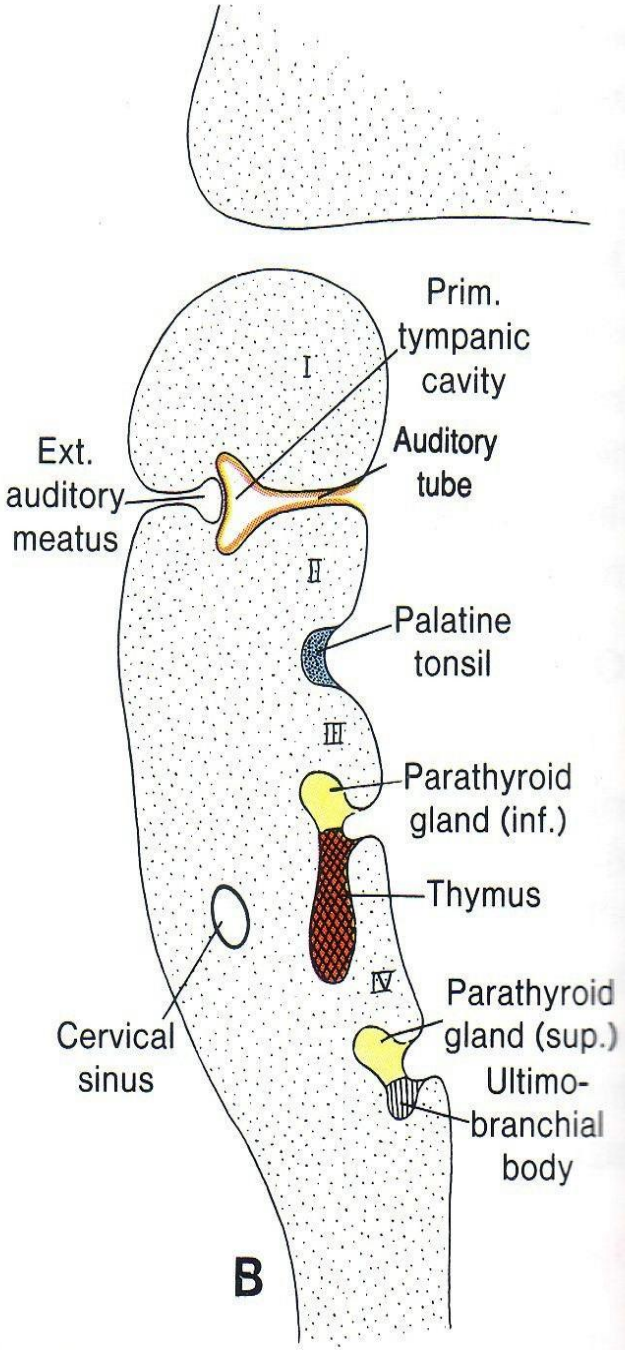
FIRST PHARYNGEAL CLEFT

Forms:

1- External auditory meatus

2- Outer layer of tympanic membrane (skin)

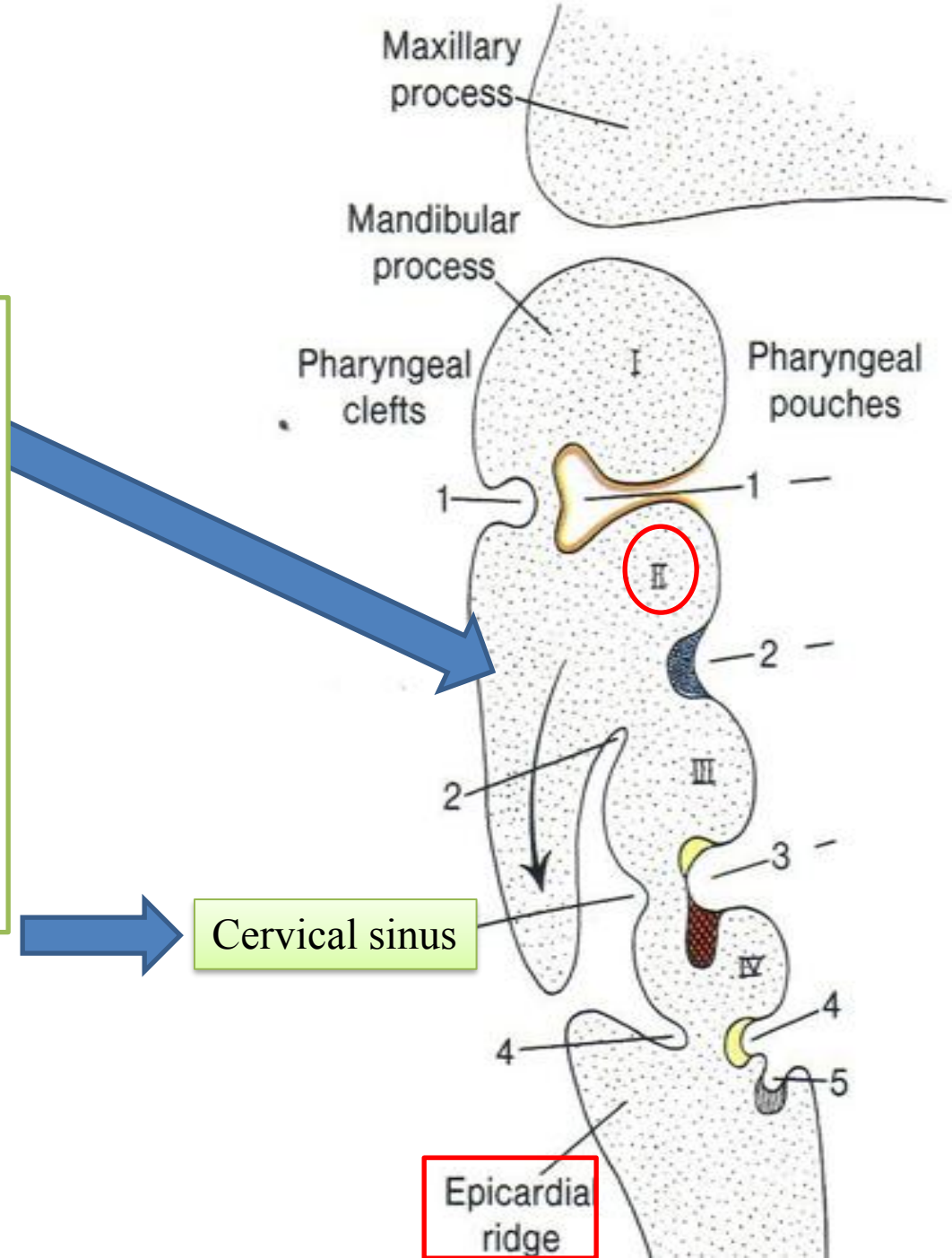




2nd 3rd and 4th PHARYNGEAL CLEFTS

Note the downward growth of 2nd arch

- Downward growth of 2nd arch will cover the other clefts with a space in between called **cervical sinus.**
- Cervical sinus becomes smaller till it is completely obliterated



Cervical (branchial) cyst
Remnant of cervical sinus
Can form a fluid filled cyst in the neck

The cervical cyst is usually not visible at birth but becomes evident as it **enlarges during childhood.**

Presents as a slowly enlarging lateral neck mass typically located in the lateral aspect of the neck, arising at any point along the anterior border of the **sternocleidomastoid muscle.** These cysts may intermittently swell, particularly in association with upper respiratory tract infections.

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Fate of pharyngeal pouches

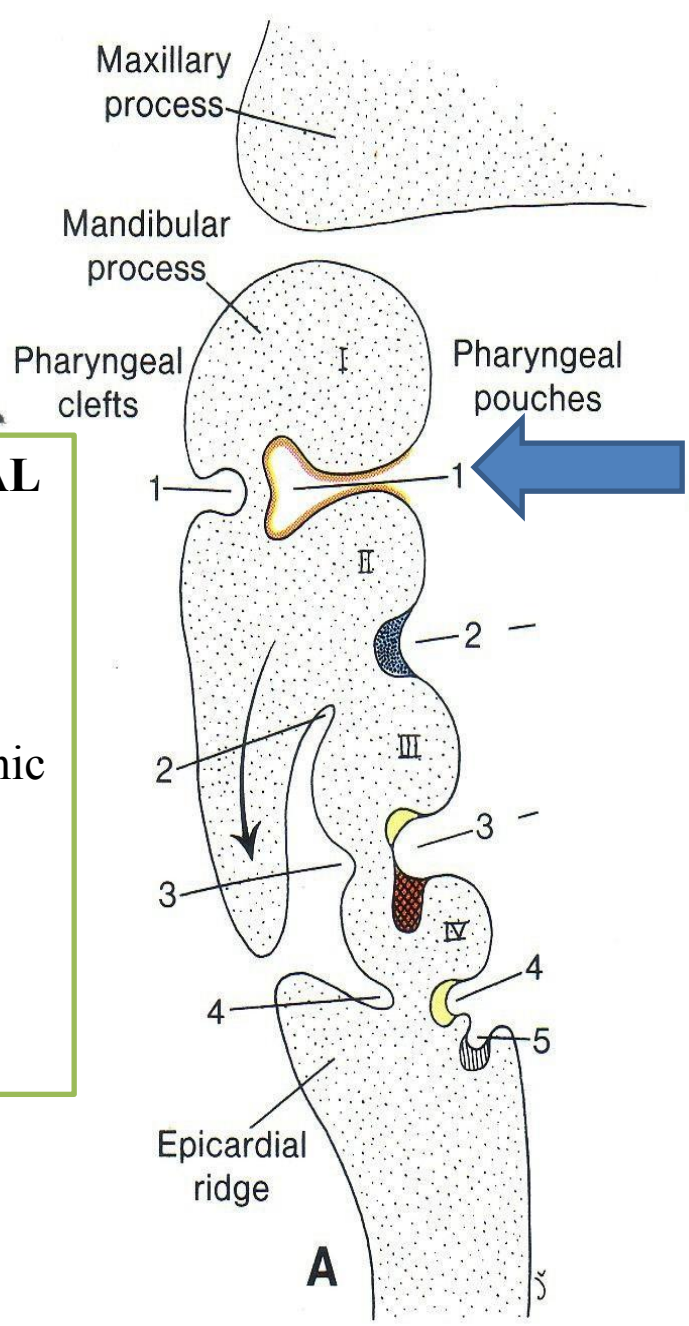
Arch	Ventral part	Dorsal part
First pouch	Occupied by the developing tongue	Inner mucous layer of tympanic membrane, middle ear and Eustachian tube
Second pouch	Occupied by the developing tongue	Palatine tonsils
Third pouch	Thymus gland	Inferior parathyroid glands
Fourth pouch	Unknown	Superior parathyroid glands
Fifth pouch	Ultimo-branchial body which forms parafollicular cells in thyroid	

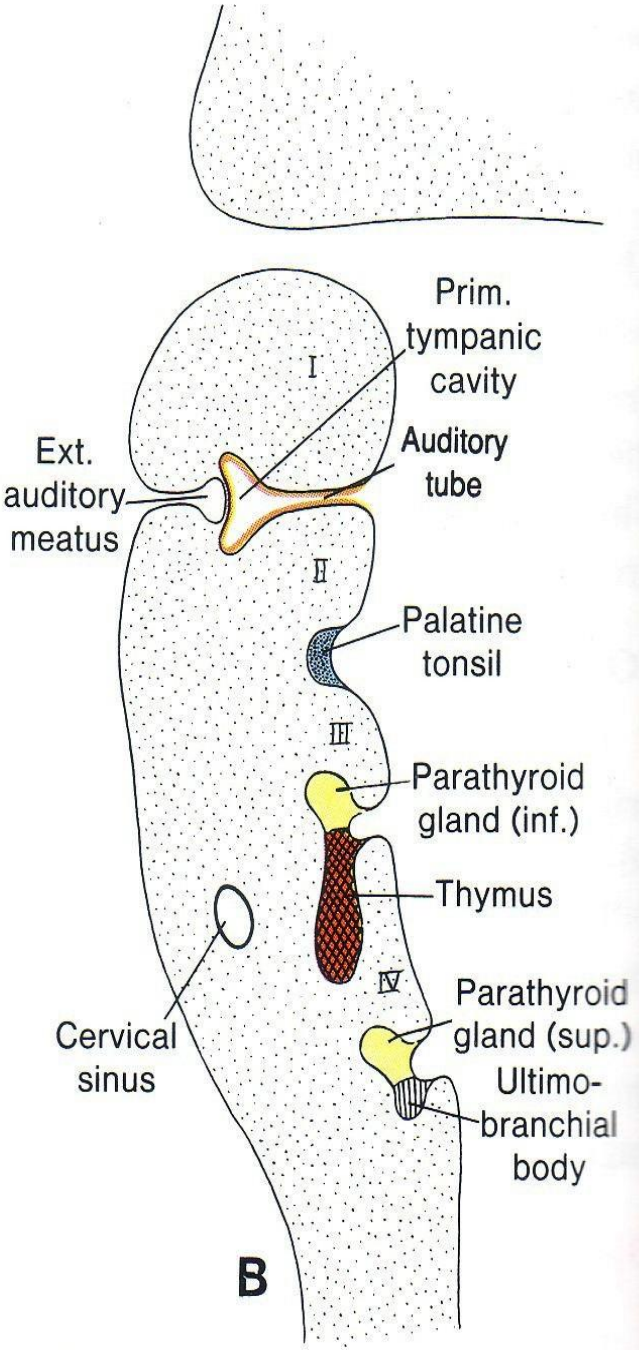
Endocrine system

Only first and second pouches are covered in MSS

FIRST PHARYNGEAL POUCH
(Dorsal end)

Forms:
1- Inner layer of tympanic membrane (mucous membrane)
2- Middle ear
3- Eustachian tube





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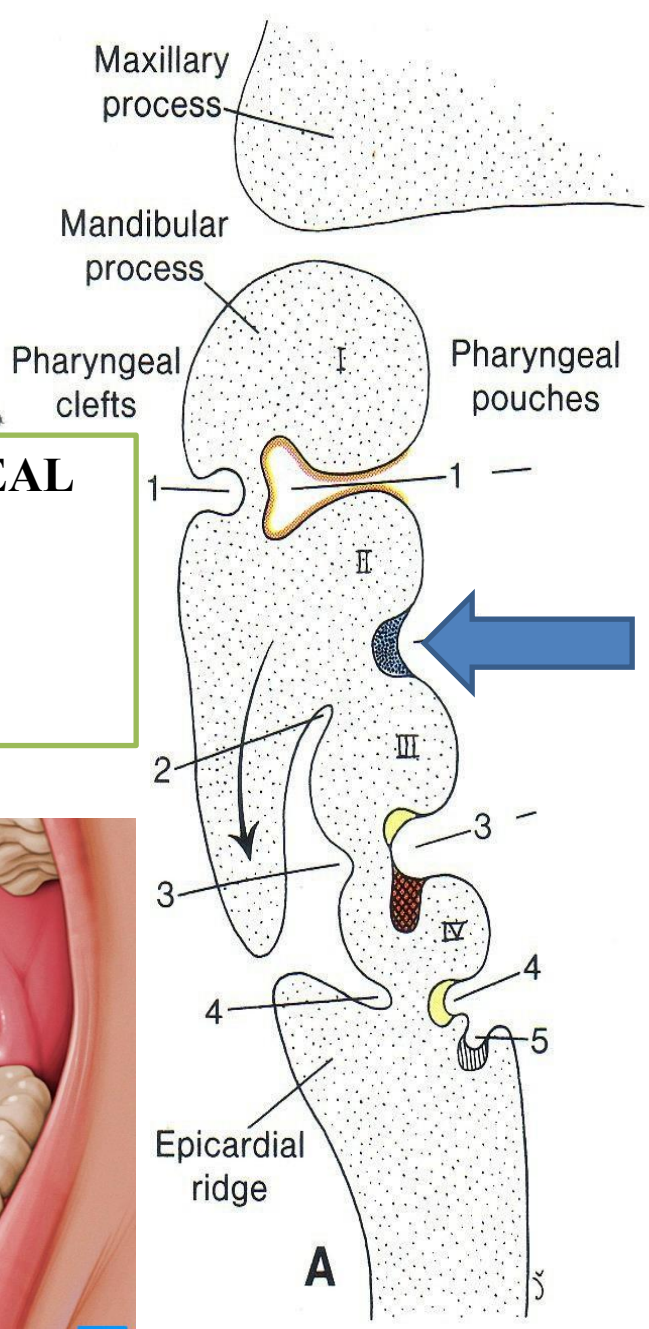
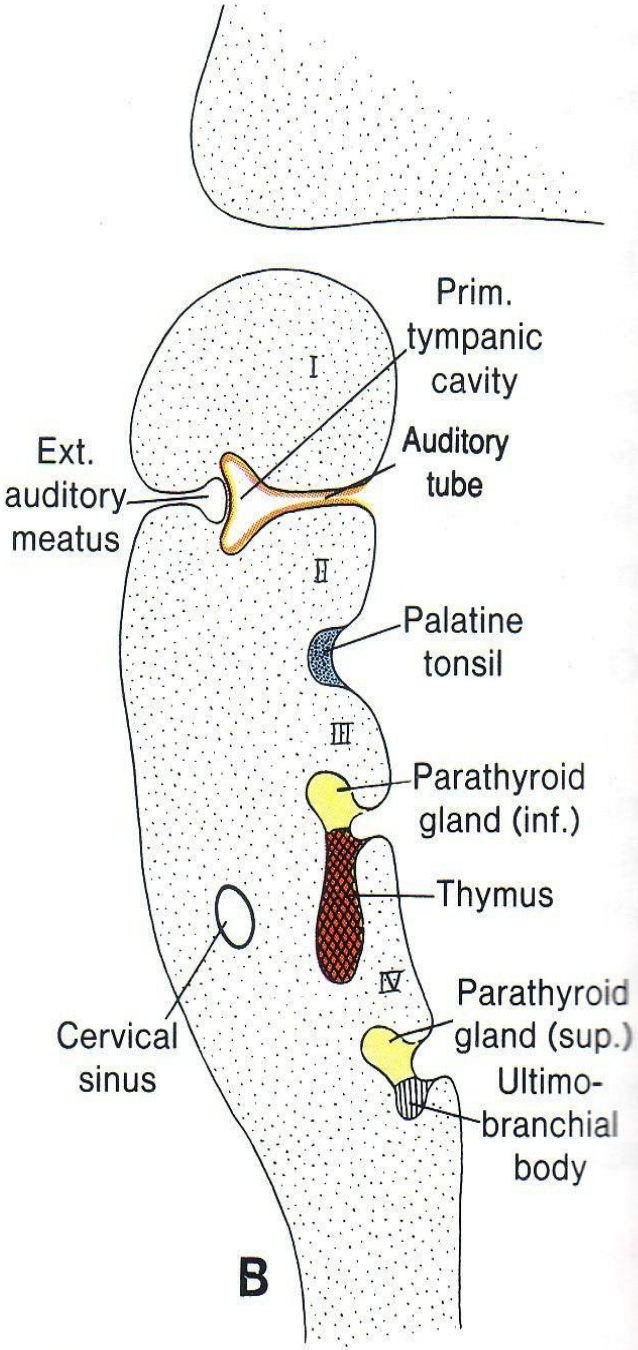
SECOND PHARYNGEAL POUCH
(Dorsal end)
Forms:
Palatine tonsils





Development of Face and Palate

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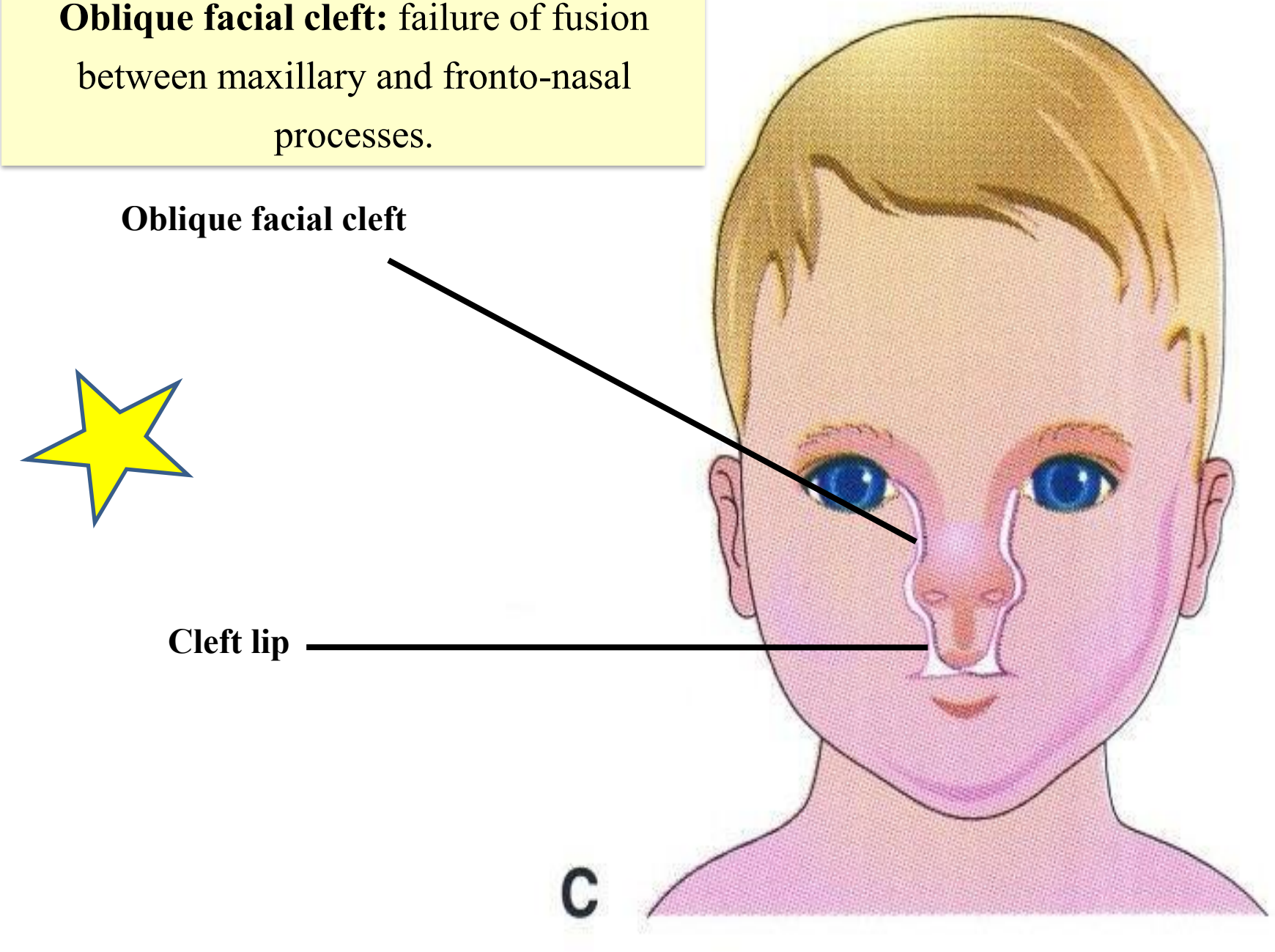
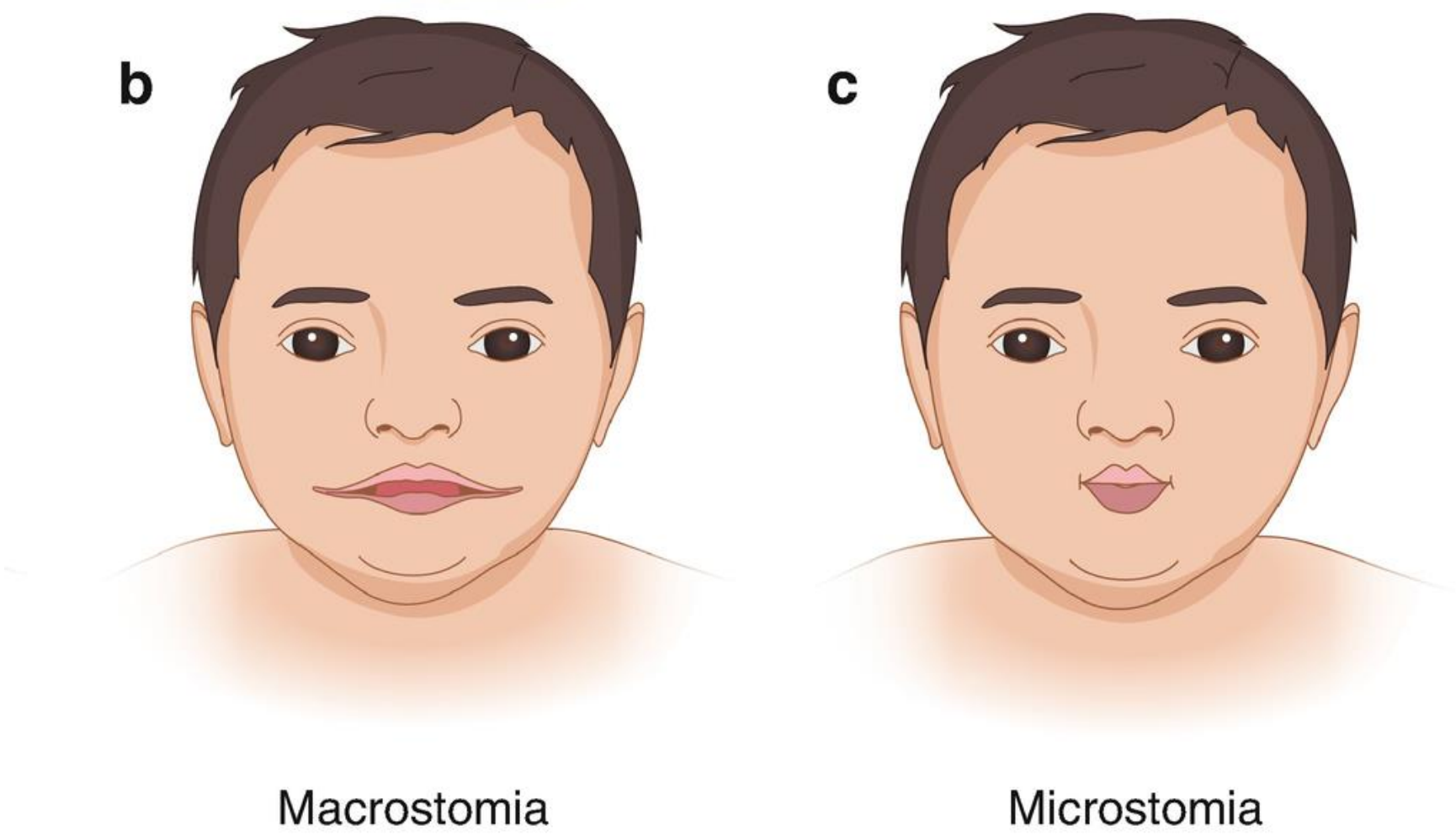
Oblique facial cleft: failure of fusion between maxillary and fronto-nasal processes.



Macrostomia or Microstomia: defective or marked fusion between maxillary and mandibular processes



Unilateral Cleft lip

Cleft (hare) lip: cleft lip due to failure of fusion between maxillary process and intermaxillary segment.

Bilateral Cleft lip

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Median cleft lip:
Results from malfusion of the medial nasal prominences

Cleft Lower Lip
The cleft is exactly central and is caused by incomplete fusion of the mandibular processes

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Cleft palate

Cleft palate: failure of fusion between different parts that form palate

The incisive foramen is considered the dividing landmark between the anterior and posterior cleft deformities

Cleft of the primary palate

✓Results from failure of the maxillary process to fuse with the intermaxillary segment

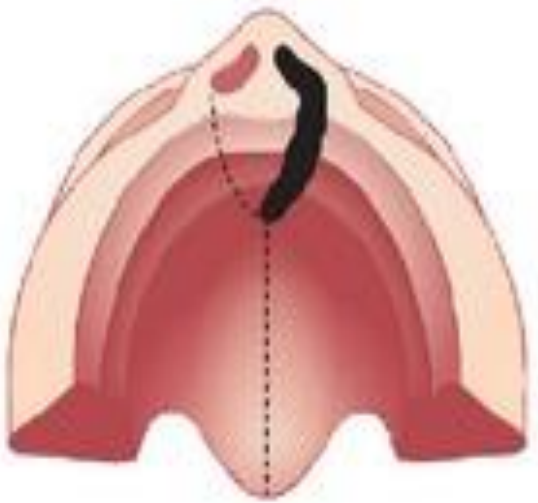
✓Takes place **anterior to the incisive foramen,** therefore this type is Anterior cleft palate

✓Note: that cleft of the primary palate is always **anterior**

✓Can be unilateral and bilateral

Primary Bilateral Cleft Palate
(combined with bilateral cleft lip)

Primary Unilateral Cleft Palate
(combined with unilateral cleft lip)



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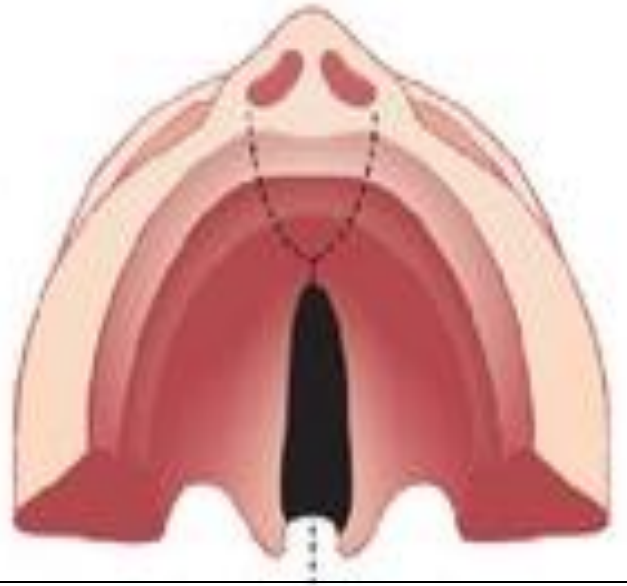
Cleft of the secondary palate

✓ Results from failure of the maxillary processes to fuse with each other

✓ Takes place **posterior to the incisive foramen,** therefore this type is Posterior cleft palate

✓Note that cleft of the secondary palate is always **posterior**

Secondary cleft palate



Cleft of the primary and secondary palate

✓Results from failure of the maxillary processes to fuse with each other and with the intermaxillary segment

✓ Takes place **anterior and posterior to the incisive foramen,** therefore this type is mixed anterior and posterior cleft palates

Primary and secondary Cleft palates
(combined with unilateral cleft lip)