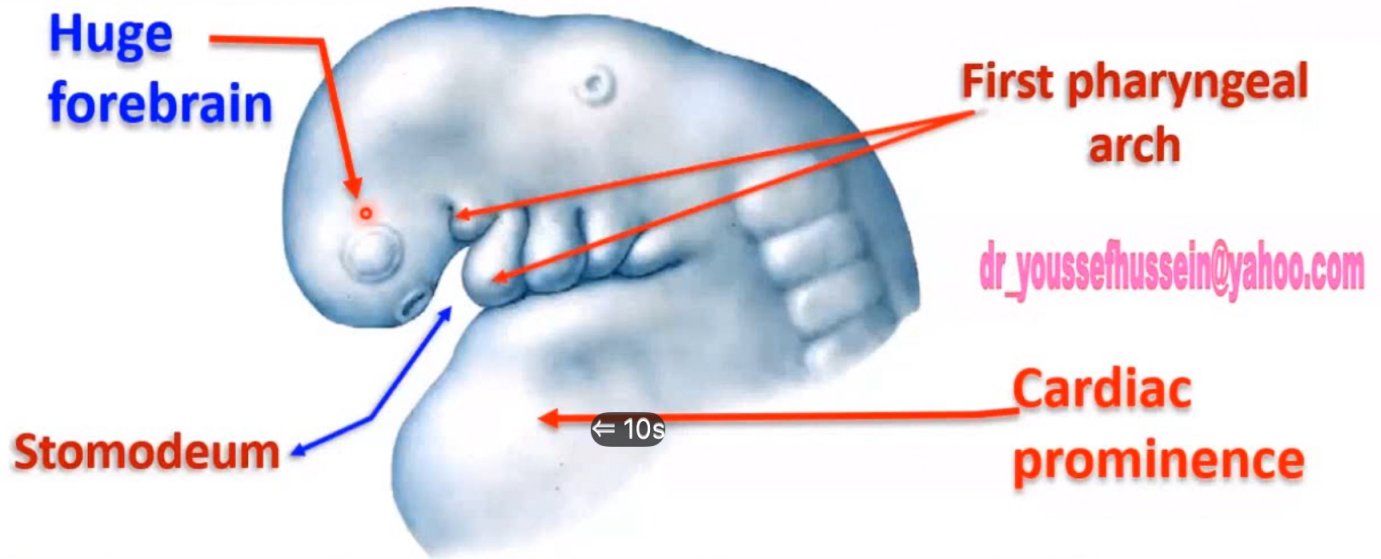


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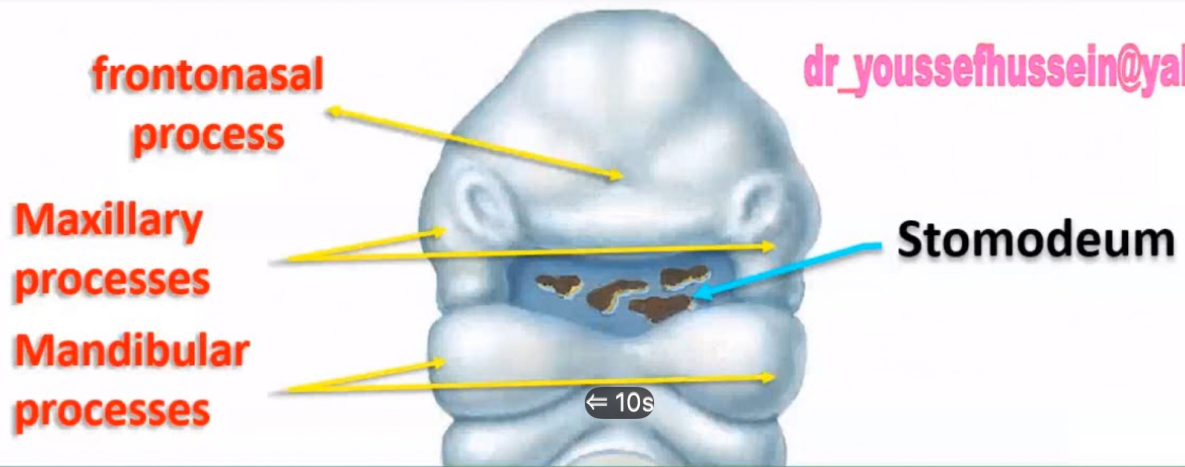


# Development of the face

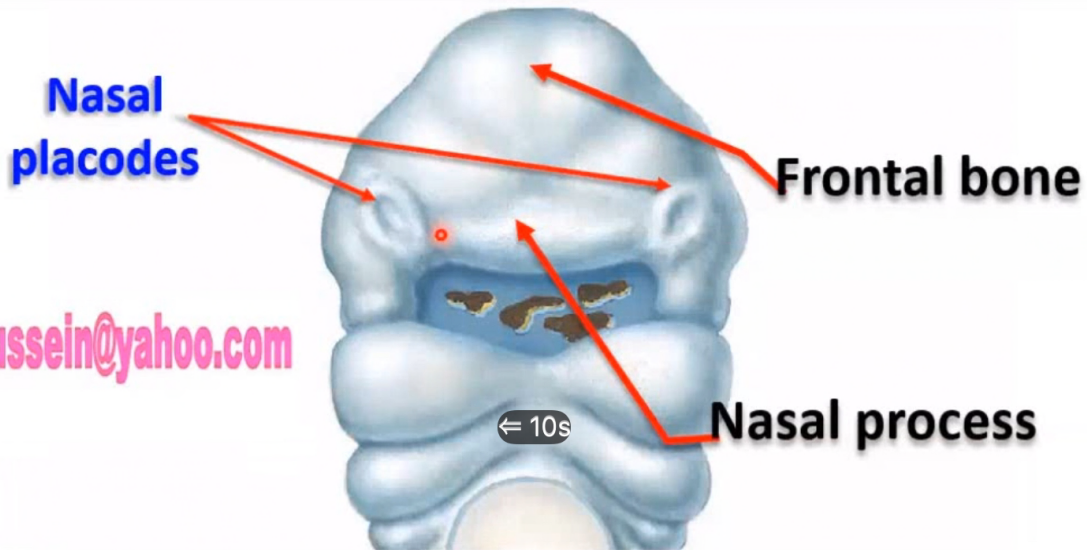


- The **face** is dominated by the appearance of the pharyngeal arches
- **Stomodeum**, Primitive oral cavity that **closed by oral membrane** is **ectodermal recess** between the relatively huge forebrain and cardiac prominence .





- The face develops from **5 mesodermal swellings** which appear around **stomodeum**
  - I. Frontonasal process** above the stomodeum.
  - II. 2 maxillary swellings** (above and lateral to the stomodeum) from the 1<sup>st</sup> pharyngeal arch.
  - III. 2 mandibular swellings** (below and lateral to the stomodeum) from the 1<sup>st</sup> pharyngeal arch.



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**\*\* Development of the frontonasal process:**

- a- The upper part forms the **frontal bone**.
- b- The lower part forms the **nasal process**.
- **Nasal placodes**, **ectodermal swellings** develop in lower border of nasal process

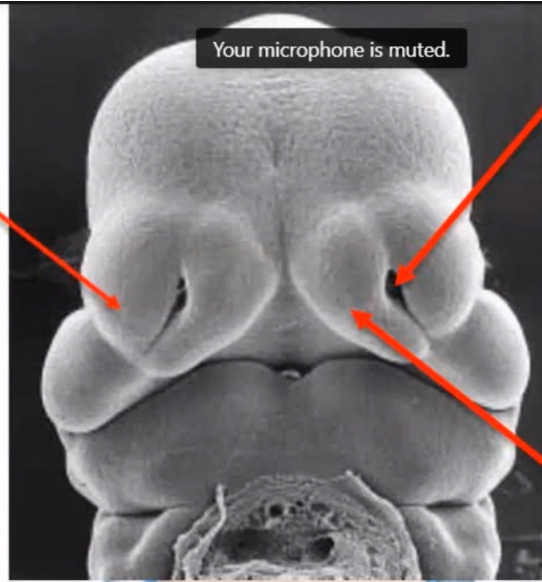
Your microphone is muted.

**Lateral nasal process**

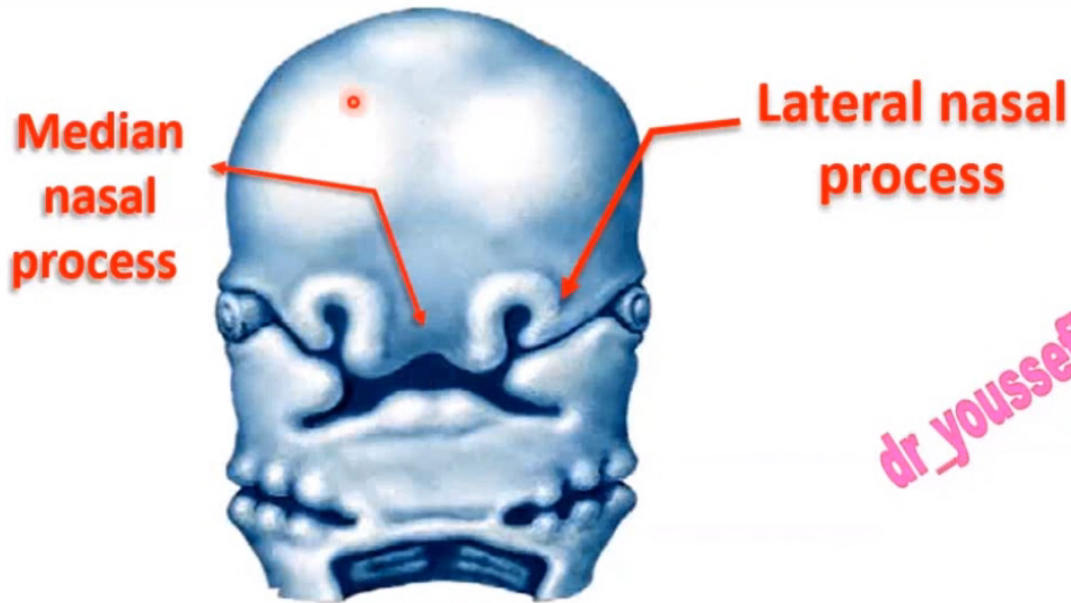
**Nasal pit**

**Medial nasal process**

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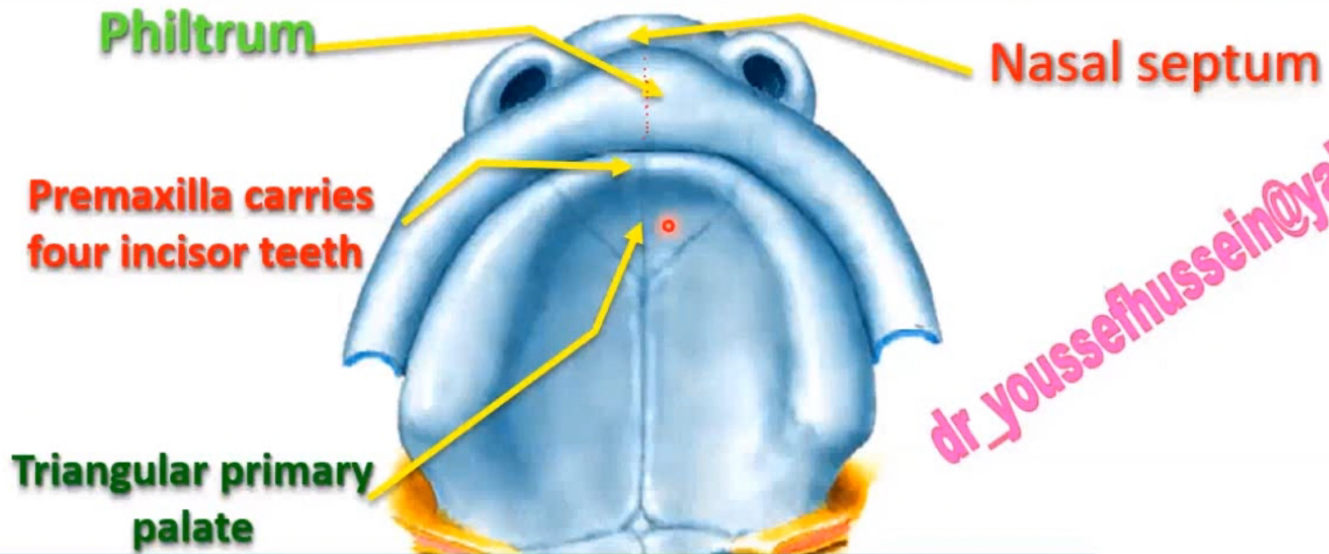


- **Two nasal pits** (nostril) appear in the nasal placode divide the nasal process:
  - a- Two lateral nasal processes form the ala of the nose.
  - b- Two medial nasal processes



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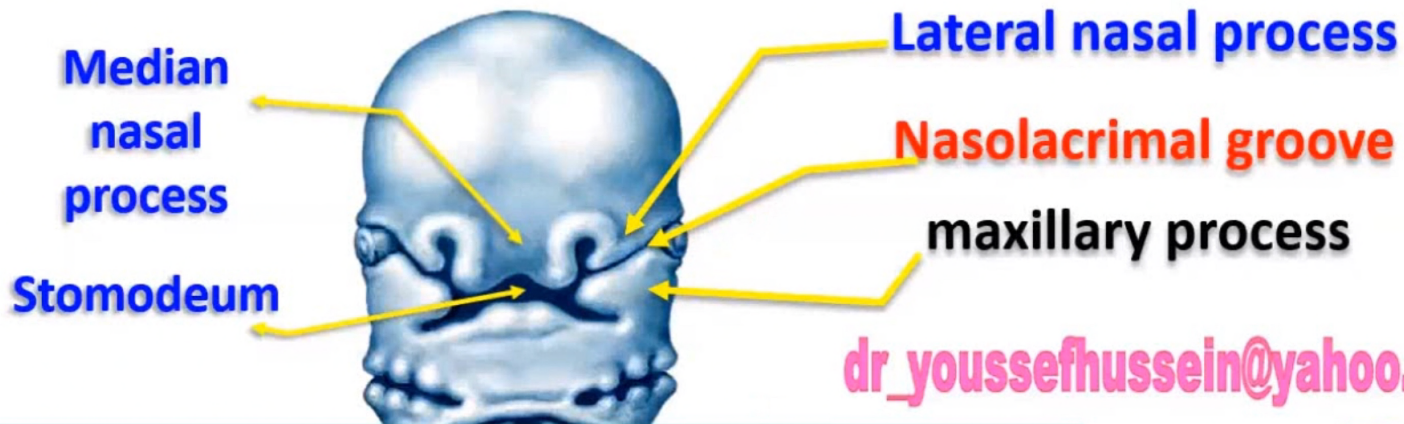
- Two medial nasal processes unite with each other forming **median nasal process** (Intermaxillary segment)



- **Median nasal process gives rise to:**

- 1- Part of the nasal septum.
- 2- Philtrum (middle) of the upper lip.
- 3- Premaxilla (upper jaw that carries 4 incisor teeth).
- 4- Primary palate.





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### Development of the maxillary process

- The 2 maxillary processes grow medially above the stomodeum towards the lateral nasal processes but separated from them by a well developed ectodermal groove called **nasolacrimal groove**.
- The edges of **nasolacrimal groove** fused forming a **solid cord**. Later on: canalized and forms the **nasolacrimal canal**.



- The maxillary processes continue to grow medially and **fused with the lateral nasal processes**. Later on; they fused with the margins of the **median nasal process to form the upper jaw**.
- A horseshoe **labiokingival groove** divides upper jaw into  
**a) Outer part forms upper lip. b) Inner part forms gum.**
  - \*\* **Development of the mandibular process**
- They grow medially below the stomodeum and fused with each other in the midline forming the **primitive lower jaw**.
- A horseshoe **labiokingival groove** divides lower jaw into  
**a) Outer part forms upper lip. b) Inner part forms gum.**
  - \*\* **Development of the muscles of the face**
- They developed from the mesoderm of the **2<sup>nd</sup> pharyngeal arch** (supplied by the facial nerve).



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# Congenital anomalies of the face

- **Oblique facial cleft**: due to failure of fusion of the maxillary processes with the **lateral nasal processes** along the line of the **nasolacrimal canal**.
- **Atresia of the nasolacrimal canal**



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- **Harelip (cleft):** in the upper lip
- It may be in the lip only or may be associated with the cleft palate.
- **Median harelip (cleft)**
- **Due to** failure of fusion of the 2 medial nasal processes (No philtrum).



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## Hare (cleft) lip

- **Unilateral harelip:** due to failure of fusion between the maxillary process and the **median nasal process** (fissure between philtrum and lateral part of the upper lip) **in one side.**
- **Bilateral harelip:** due to failure of fusion between the maxillary processes with the median nasal processes, **on both side.**



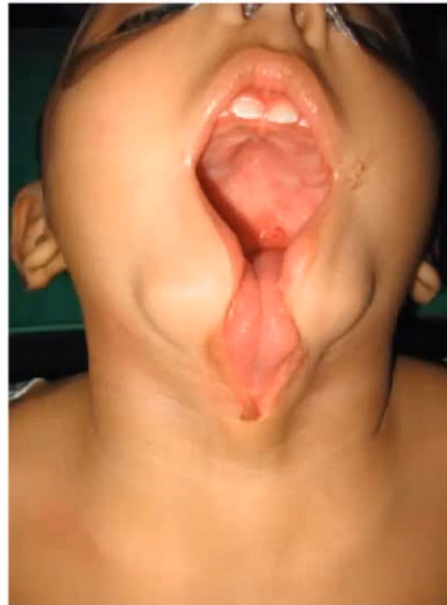
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**Unilateral**

**Bilateral**

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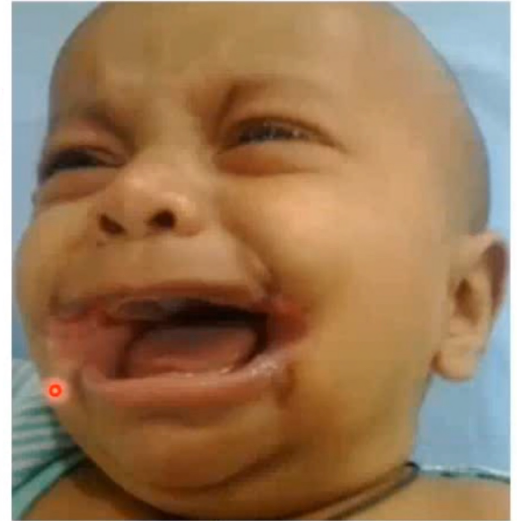
**Cleft lower lip** due to failure of fusion of **mandibular processes** in the midline.



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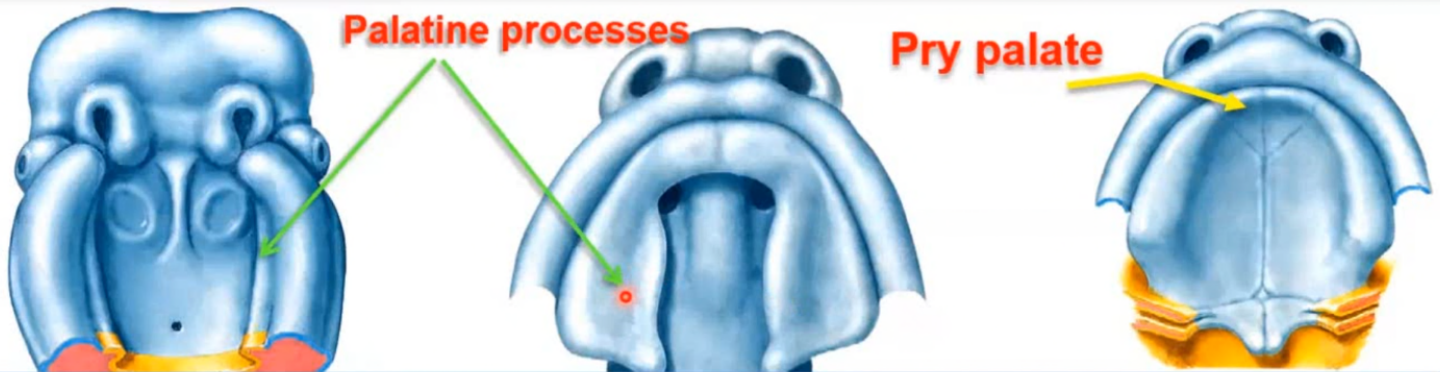
- **Microstomia** (narrow mouth opening): due to **excessive fusion** of the maxillary and mandibular processes on each side.

- **Macrostomia** (wide mouth opening): due to **incomplete fusion** of the maxillary and mandibular processes on each side.

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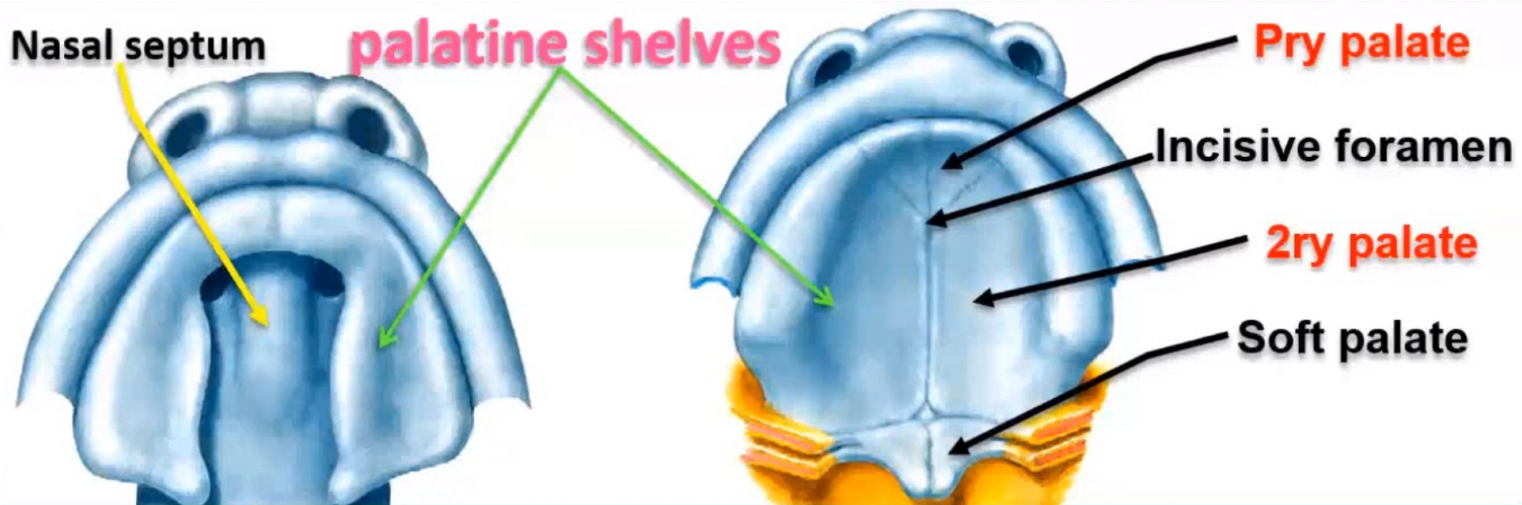
# Development of the palate



### Hard palate

- At first the **nasal and oral cavities** are continuous with each other.
  - Later on, The 2 cavities are separated by the development of hard palate.
- 1) The **Primary palate** is a triangular bone developed from **median nasal process**.
  - 2) The **secondary palate** arises as 2 bony shelves (**palatine processes**) arise from **maxillary processes** and grow horizontally and medially above tongue.

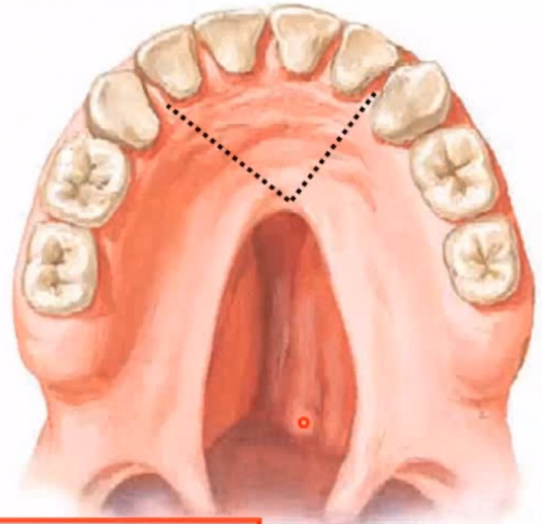




- The palatine shelves fuse with
  - a- Each other in the **midline**.
  - b- **Lower end of the nasal septum**.
  - c- **Primary palate (Anteriorly)** separated from it by incisive foramen.
    - **Soft palate**
- arises as 2 folds from posterior edges of palatine processes (shelves). They fused together

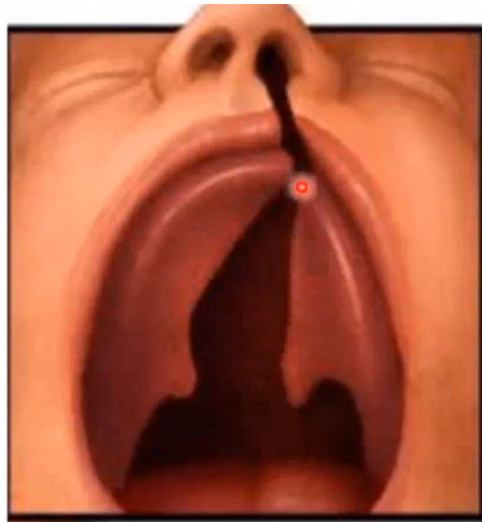
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- **Median cleft palate:** due to failure of fusion of the two palatine processes of the maxilla with each other in the midline.



- **Complete cleft palate:**
  - Failure of formation of the two palatine processes of the maxilla.
  - The oral cavity continues with nasal cavity.
  - It is commonly combined with cleft upper lip

- **Unilateral cleft palate:** due to failure of fusion of the two palatine processes of the maxilla with each other in the **midline** and with the primary palate on one side, **associate with cleft upper lib.**



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- **Bilateral cleft palate:** due to failure of fusion of the two palatine processes of the maxilla with each other in the **midline** and **with the primary palate on both sides, associate with cleft upper lib.**

