CLEFT LIP AND PALATE

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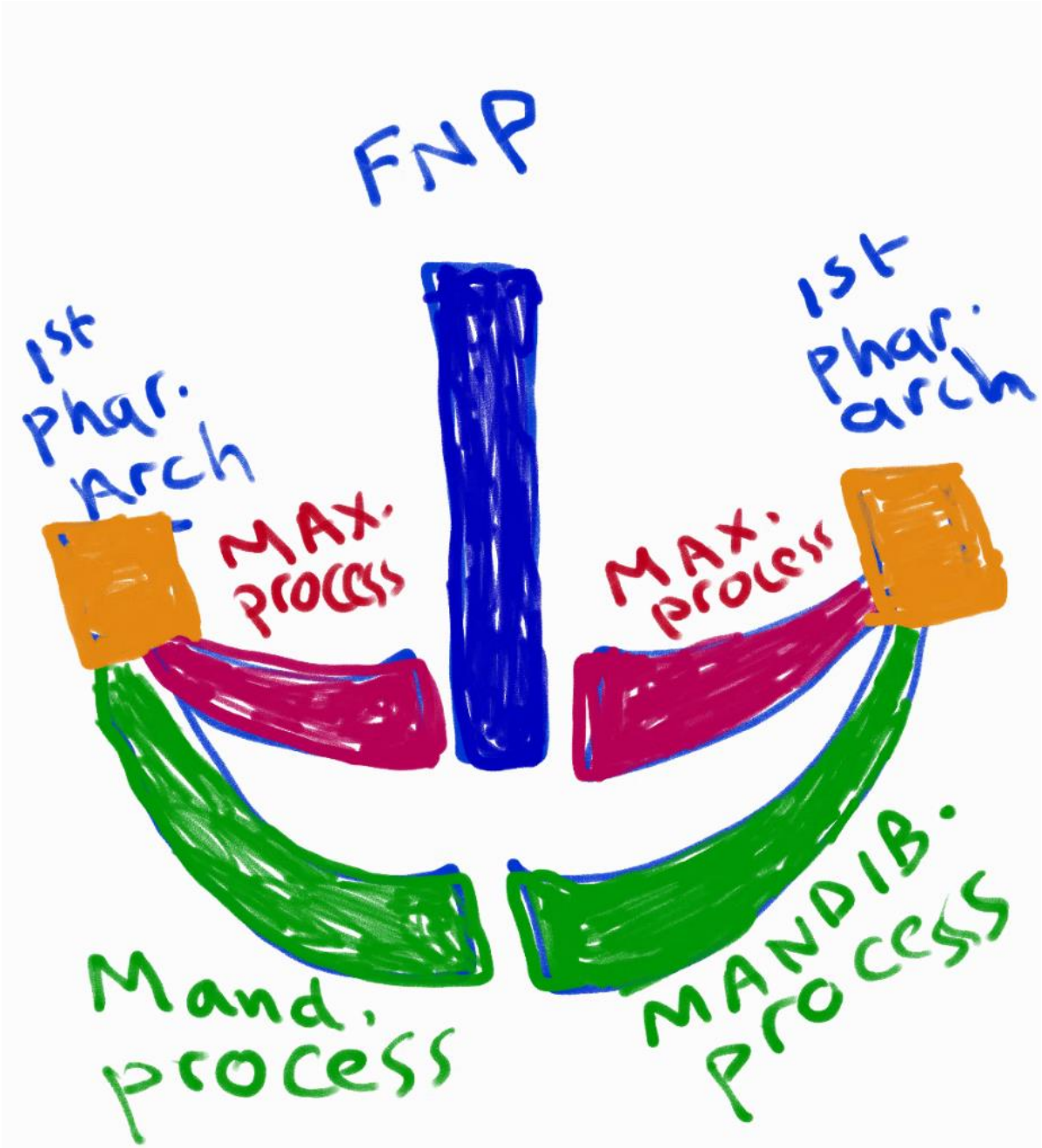
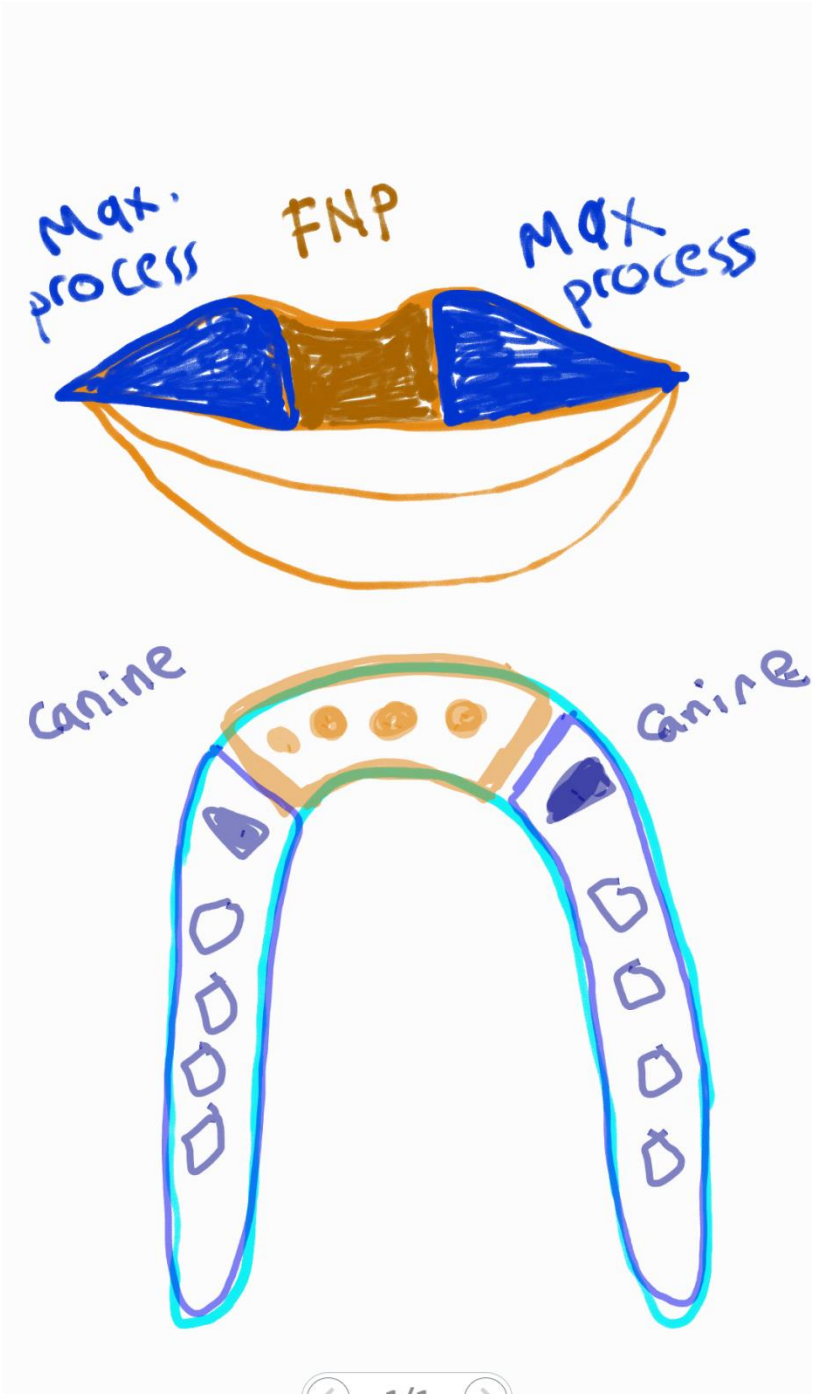

FNP
1st Phar. arch
MAX. process
1st Phar. arch
MAX. process
Mand. process
MANDIB. PROCESS


Max. process
FNP
Max process
Canine
Canine

EMBRYOLOGY

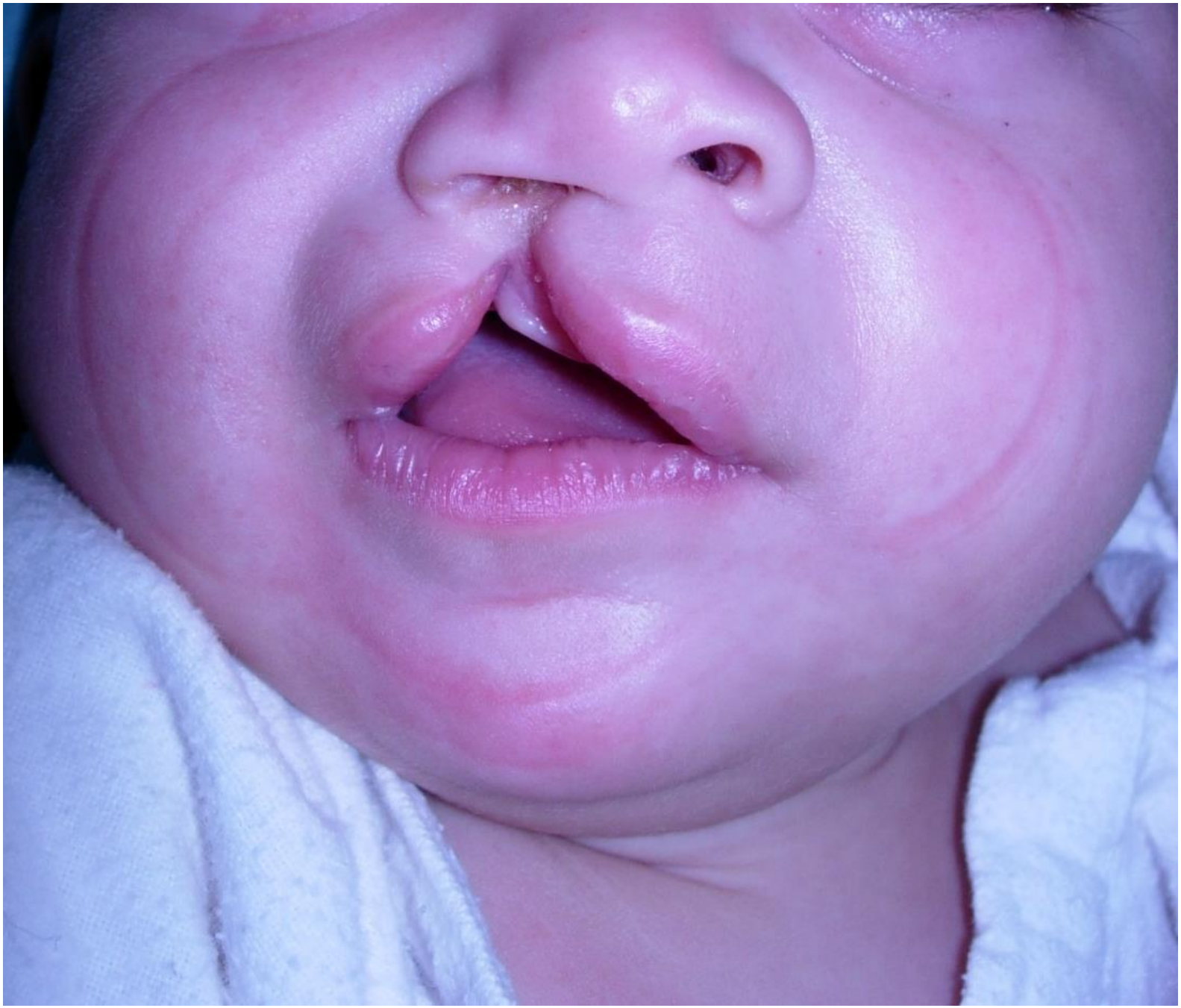
Frontonasal process which is proliferation of mesenchyme from the ventral surface of the developing brain, forms the, **nose, the central part of the upper lip (the philtrum), and the central part of the alveolar process (the part which carries the central and lateral incisors)**.

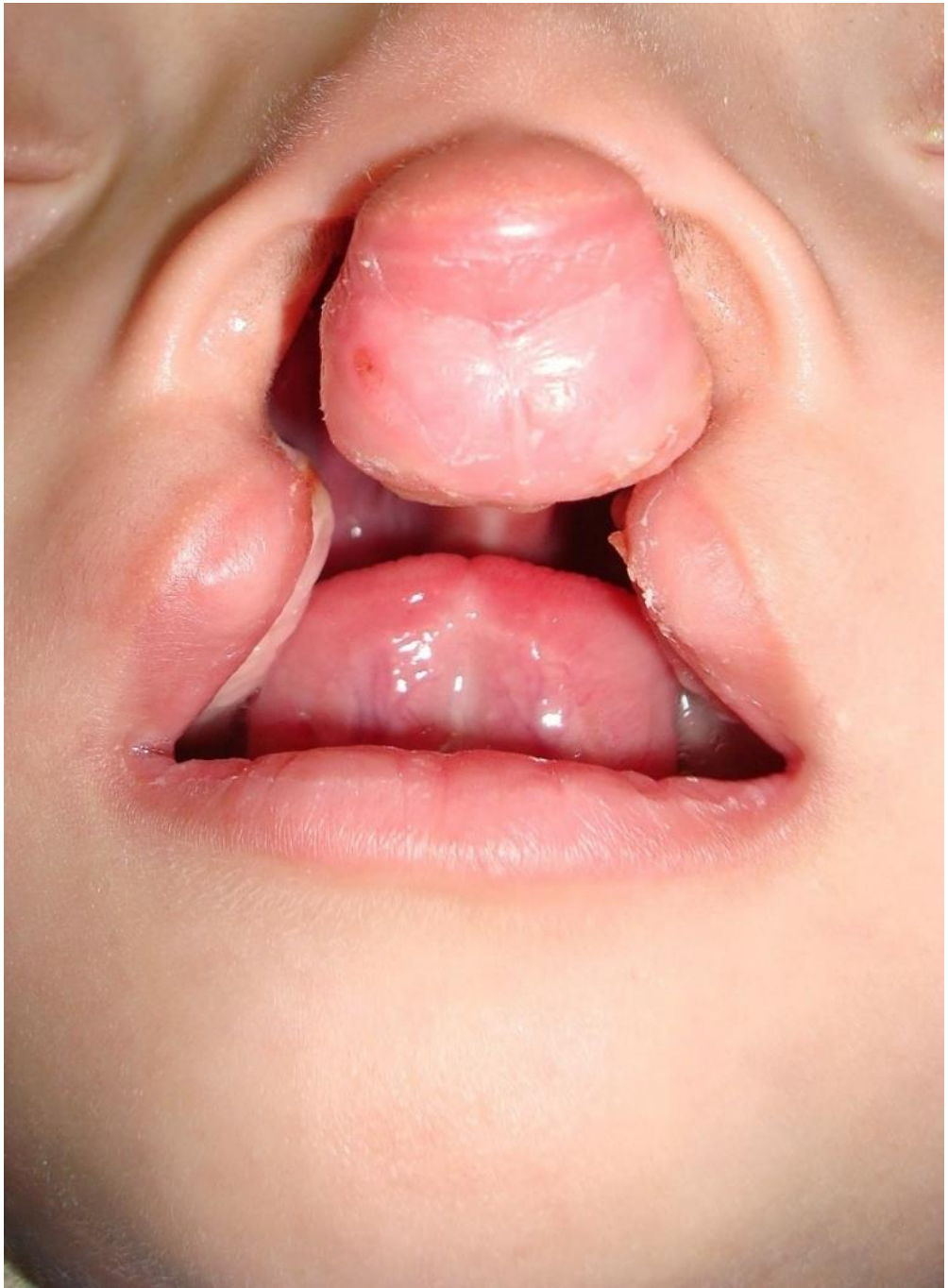
The first pharyngeal arch gives rise to the maxillary and the mandibular processes.

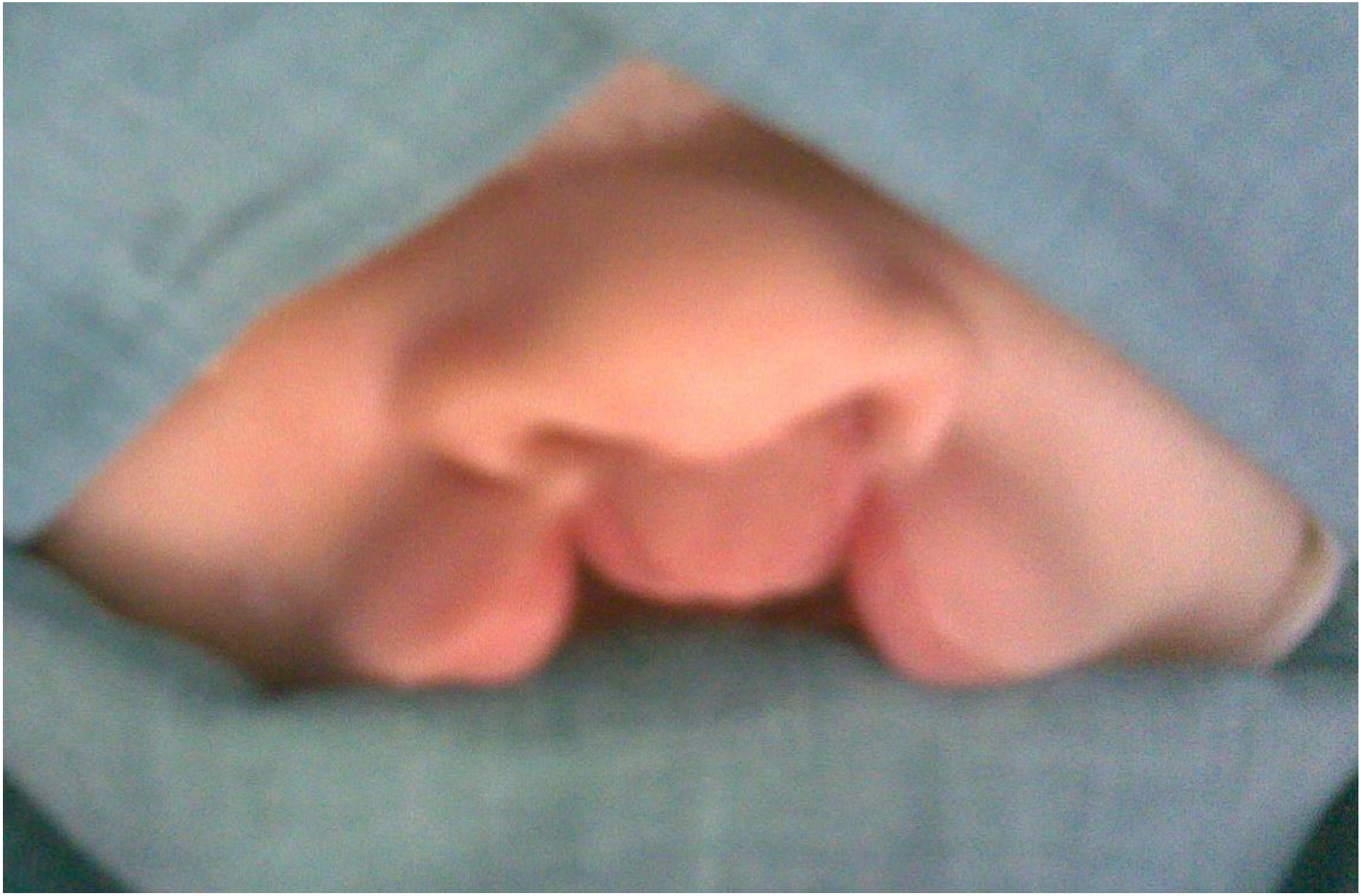
The maxillary processes from both sides give: the lateral parts of the upper lip, the lateral parts of the alveolus, it also gives rise to the palatine shelves which fuse in the midline to form the palate. The mandibular processes from each side fuse to form the lower lip and the mandible.

So the cleft lip and cleft alveolus result from non fusion of the frontonasal process with either one or both maxillary processes resulting in left, right, or bilateral cleft.

Non fusion of the palatine shelves, result in cleft palate.







INCIDENCE

- **The incidence of Cleft Lip or Cleft Palate is 1:750 live births.**
- **The most common craniofacial anomalies (2/3 of all craniofacial anomalies).**
- **The incidence of cleft lip is two times that of cleft palate.**
- **In cleft lip, 60% of the cases affect the left side, 30% the right side, and 10% bilateral.**
- **Cleft lip is more common in males, while cleft palate is more common in females.**
- **Isolated cleft palate is associated with other syndromes in 30% of cases.**

ETIOLOGY

- Not known.
- Hereditary plays an important role.
- Vitamin deficiency in pregnancy (folic acid).
- Drugs as steroids.
- Gestational viral infections or irradiation.
- Loss of amniotic fluids.

CLEFT LIP

- Usually associated with nasal deformity, is purely aesthetic problem.
- Can be corrected at birth or later at any age.
- Most surgeons prefer to repair it at 3 months of age.

CLEFT ALVEOLUS

- May lead to abnormal teething especially of the lateral incisors and canines.
- Orthodontic treatment corrects the alignment of the alveolar arch.
- Need alveolar bone graft at the age of 8-9 years to allow the eruption of the permanent canine.

CLEFT PALATE

Associated with functional problems:

- **Feeding.**
- **Speech.**
- **Regurgitation of food from nose.**
- **Recurrent ear infections and hearing**

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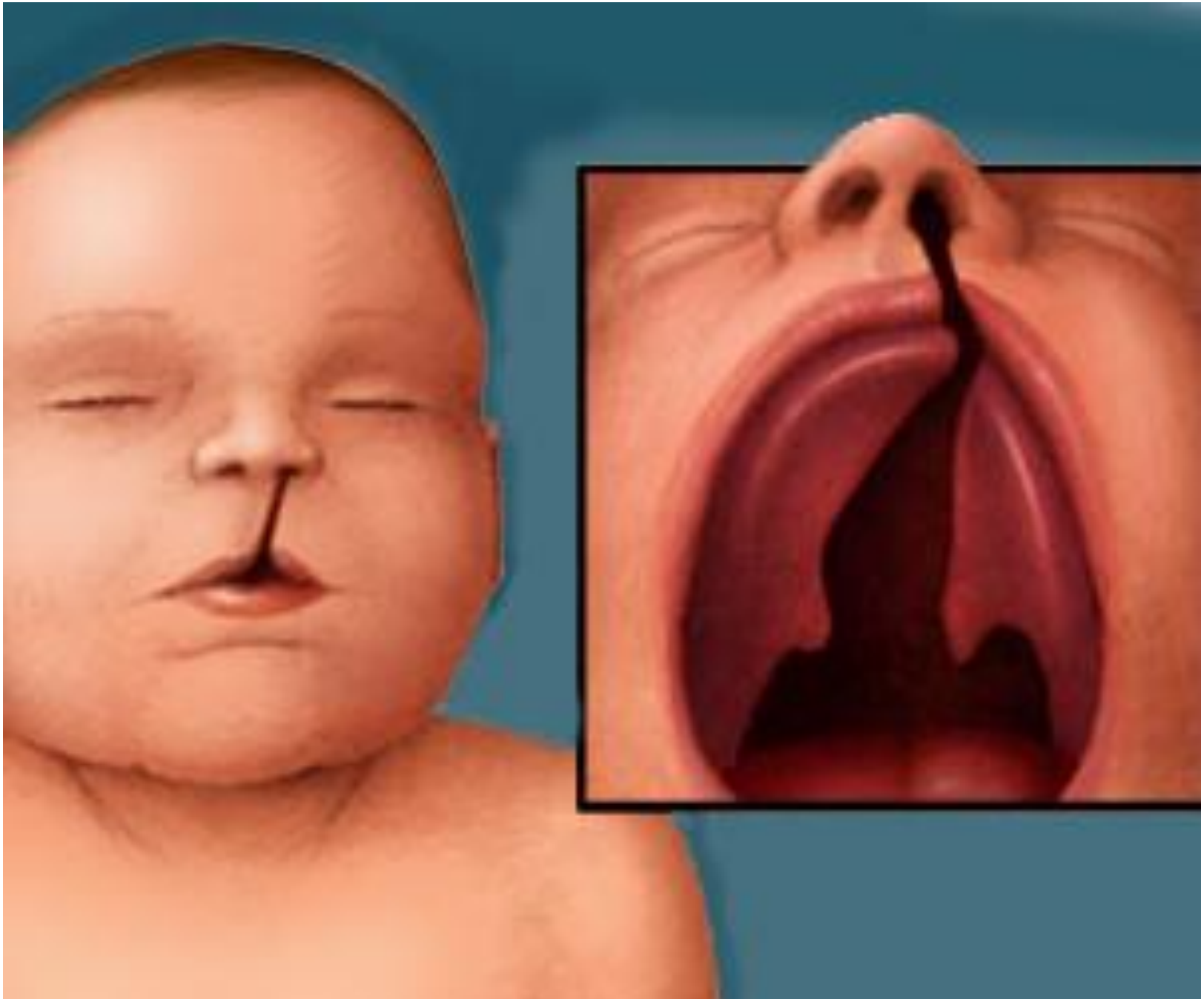

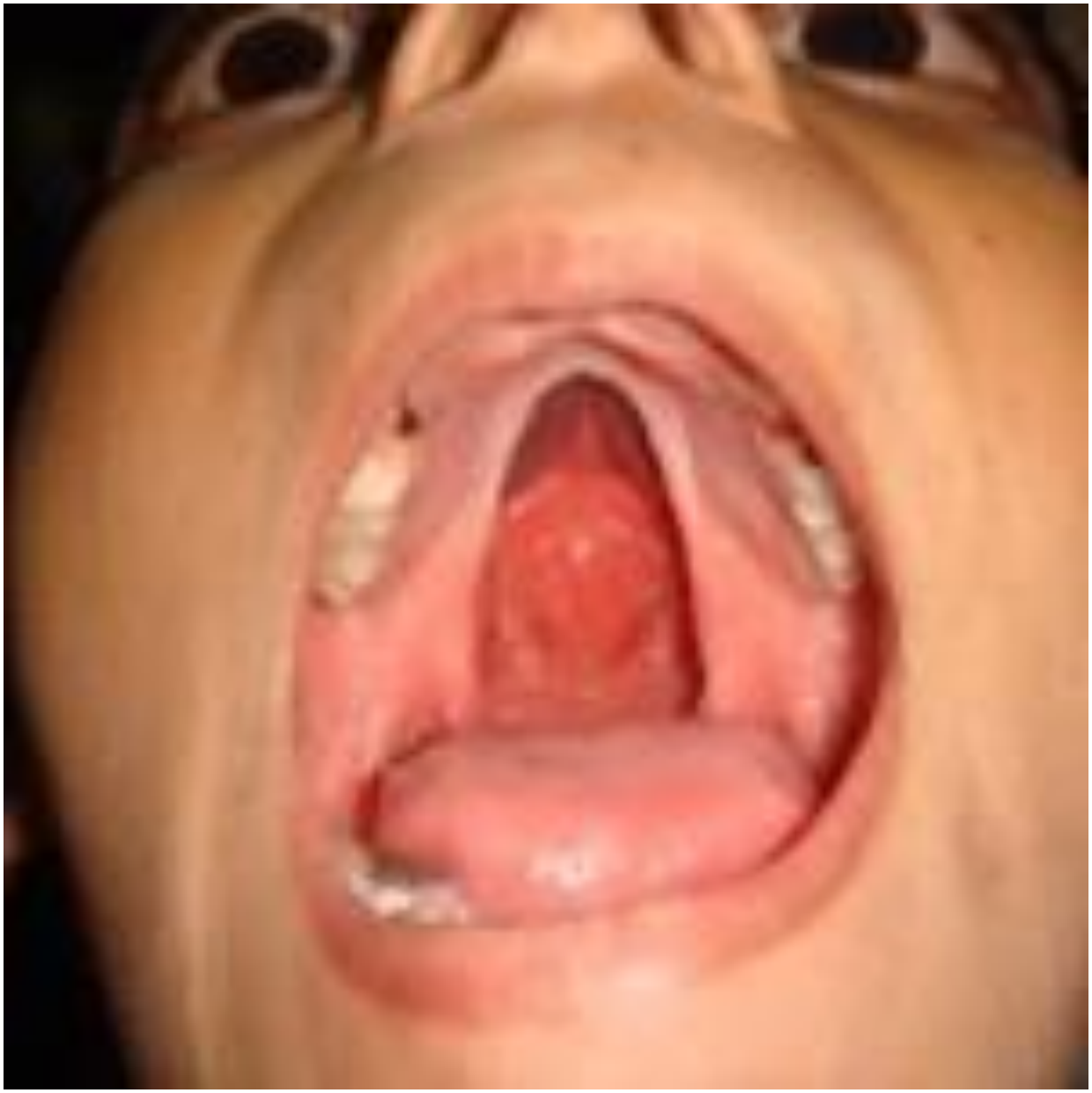

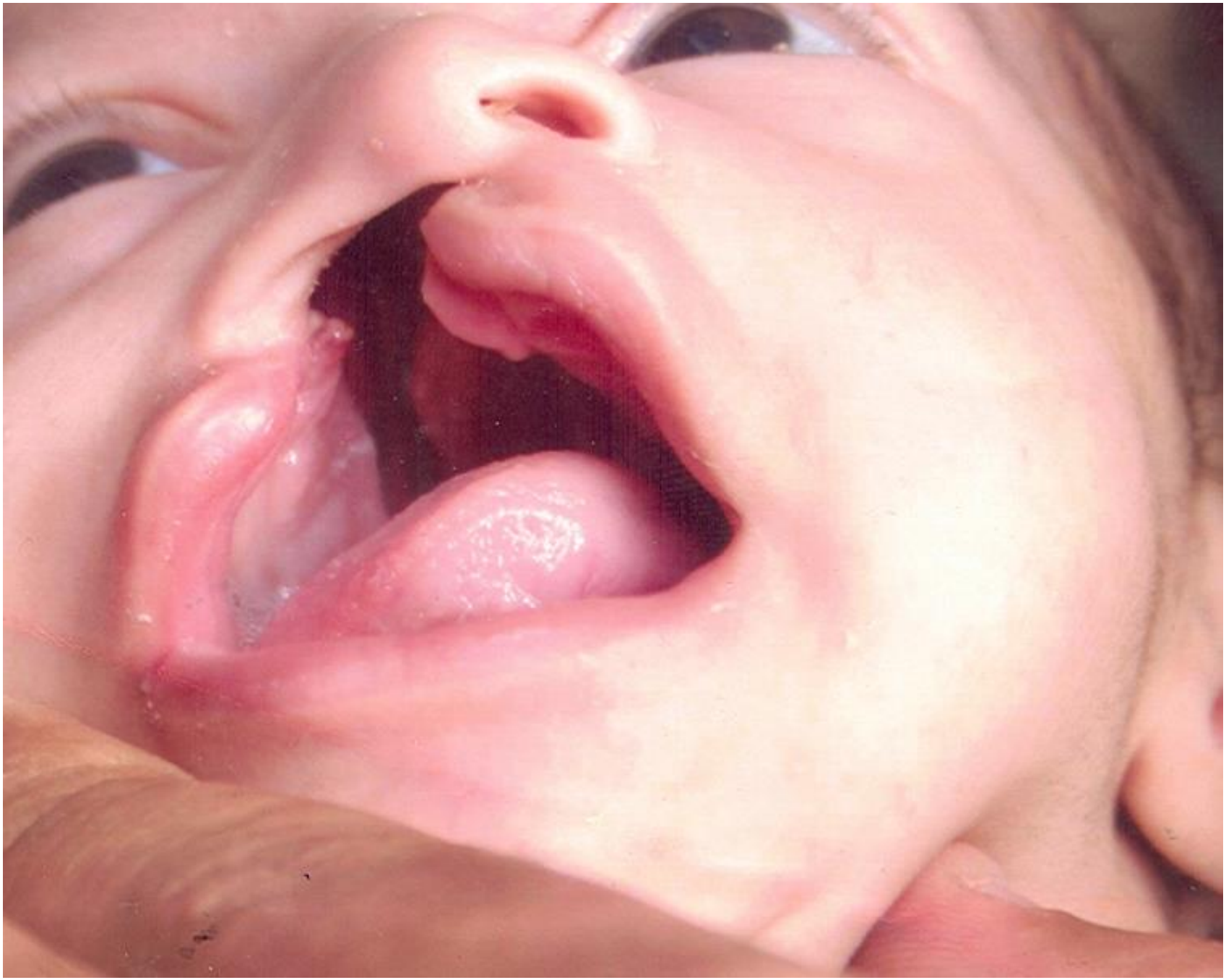

Function of the soft palate:

The soft palate (velum) is formed of muscles that elevate the soft palate and push it backward to meet the posterior pharyngeal wall so as to close and separate the nasopharynx from the oropharynx.

So the **velopharyngeal competence** is defined as the ability of the soft palate (velum) and the pharynx to act as a valve between the mouth and the nose.

This valve should be **open in breathing** to allow air to get into airways.

It should be closed in:

1. **swallowing** to prevent nasal regurgitation of food.
2. **Normal speech** so as to create a positive pressure inside the oral cavity to pronounce most of the consonants.
3. **In suckling to create negative pressure for suckling.**
4. **Blowing balloons!!!!!!!!!**

VELOPHARYNGEAL INCOMPETENCE.

Failure of this valve mechanism is called VPI

Cleft palate is the most common cause of VPI.

attributed to 3 abnormalities in the patient with cleft palate:

1. **The mechanical defect of the cleft.**
2. **Hypoplasia of the palate.**
3. **Abnormal insertion of the palatal muscles.**

Surgical correction of cleft palate, aims at closure of the cleft palate, to restore the velopharyngeal competence.

FAMILY COUNSLING

The parents of the cleft baby, should be counseled. Reassuring them, relieving their anxiety, discussing with them the problems associated with cleft palate:

- **Feeding and its management.**
- **Nasal regurgitation.**
- **Speech abnormalities (nasal speech)**
- **Follow up by the ENT specialist to manage the ear infections.**
- **Timing of repair.**

The family should be introduced to the Cleft Palate Team which consists of: Plastic surgeon, Pediatrician, ENT surgeon, Dentist, Orthodontic surgeon, Speech therapist, Cleft palate nurse, and Social worker.

FEEDING

- Babies have defective sucking but swallowing is normal.
- Breast feeding is difficult.
- Solved simply by passive introduction of milk to the mouth by widening the opening of the bottle nipple.
- The mother is the best nurse.
- Nasogastric feeding should not be used for permanent feeding.
- Baby should be nursed in semi-sitting position and should be burped well, to get rid of the swallowed air.
- Feeding takes more time than normal babies, the mother must be patient!!!
- Although breast feeding is difficult is not contra-indicated.

SPEECH.

Normal speech requires that air coming from the lungs, passing through the vocal cords, is collected in the oral cavity to create positive pressure, before passing through the lips to pronounce most consonants.

Patients with velopharyngeal incompetence, are unable to create this positive intra-oral pressure as air leaks through the nose, leading to nasal escape, or abnormal nasal speech. Again surgical correction of the cleft helps to restore normal

RECURRENT OTITIS MEDIA AND HEARING LOSS

The resultant hearing loss is acquired not congenital.

Normally the Eustachian tubes should be patent and aerated to balance the pressure on the two sides of the tympanic membrane.

In cleft palate patients the tubes are not patent so fluid accumulates behind the eardrums, leading to secretory otitis media and recurrent bacterial otitis media, and if not managed, would result in hearing loss.

The ENT surgeon treats secretory otitis media (by drugs or Gromet tubes), and treating acute otitis media by suitable antibiotics.

TIMING OF SURGICAL REPAIR OF CLEFT PALATE

Speech therapists: the earlier the repair is, the better the outcome of speech would be.

Facial surgeons: early surgery interferes with the facial bony growth leading to retardation of maxillary growth (dish face).

So the compromise between these two opinions is to operate at 1 year of age.