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PLASTIC SURGON

CLEFT LIP AND PALATE

Cleft lip (*cheiloschisis*) and **cleft palate** (*palatoschisis*),

which can also occur together as **cleft lip and palate**, are variations of a type of clefting congenital deformity caused by abnormal facial development during gestation. A **cleft** is a fissure or opening—a gap. It is the non-fusion of the body's natural structures that form before birth. Approximately 1 in 700 children born have a cleft lip or a cleft palate or both. In decades past, the condition was sometimes referred to as **harelip**, based on the similarity to the cleft in the lip of a hare, but that term is now generally considered to be offensive

- During the first six to eight weeks of pregnancy, the shape of the embryo's head is formed. Five primitive tissue lobes grow:
  - **a)** one from the top of the head down towards the future upper lip; (Frontonasal Prominence)
  - **b-c)** two from the cheeks, which meet the first lobe to form the upper lip; (Maxillar Prominence)
  - **d-e)** and just below, two additional lobes grow from each side, which form the chin and lower lip; (Mandibular Prominence)

If these tissues fail to meet, a gap appears where the tissues should have joined (fused). This may happen in any single joining site, or simultaneously in several or all of them. The resulting birth defect reflects the locations and severity of individual fusion failures (e.g., from a small lip or palate fissure up to a completely malformed face).

. Formation of the palate is the last step in joining the five embryonic facial lobes, and involves the back portions of the lobes b and c. These back portions are called palatal shelves, which grow towards each other until they fuse in the middle, This process is very vulnerable to multiple toxic substances, environmental pollutants, and nutritional imbalance

CAUSES OF CLEFT LIP AND PALATE

Genetic factors: contributing to cleft lip and cleft palate formation have been identified for some syndromic cases, but knowledge about genetic factors that contribute to the more common isolated cases of cleft lip/palate is still patchy. Many clefts run in families, even though in some cases there does not seem to be an identifiable syndrome present ,possibly because of the current incomplete genetic understanding of midfacial development.

Environmental influences:

may also cause, or interact with genetics to produce, orofacial clefting:

1. the gene *PHF8* that cause cleft lip/palate
2. In humans, fetal cleft lip and other congenital abnormalities have also been linked to maternal hypoxia, as caused by e.g. maternal smoking.
3. maternal alcohol abuse
4. some forms of maternal hypertension treatment.
5. Other environmental factors that have been studied include: maternal diet and vitamin intake; retinoids — which are members of the vitamin A family;

anticonvulsant drugs; alcohol; cigarette use; nitrate compounds; organic solvents; parental exposure to lead; and illegal drugs (cocaine, crack cocaine, heroin, etc.).

Current research continues to investigate the extent to which folic acid can reduce the incidence of clefting.[37]

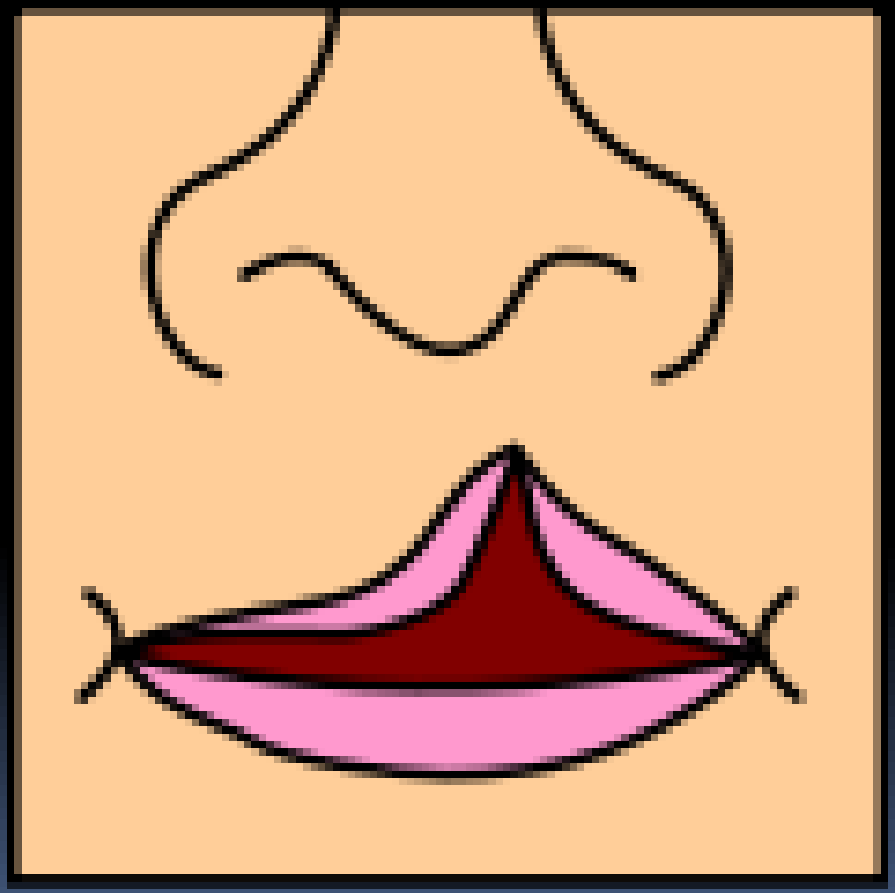
TYPES OF CLEFT LIP

microform cleft.

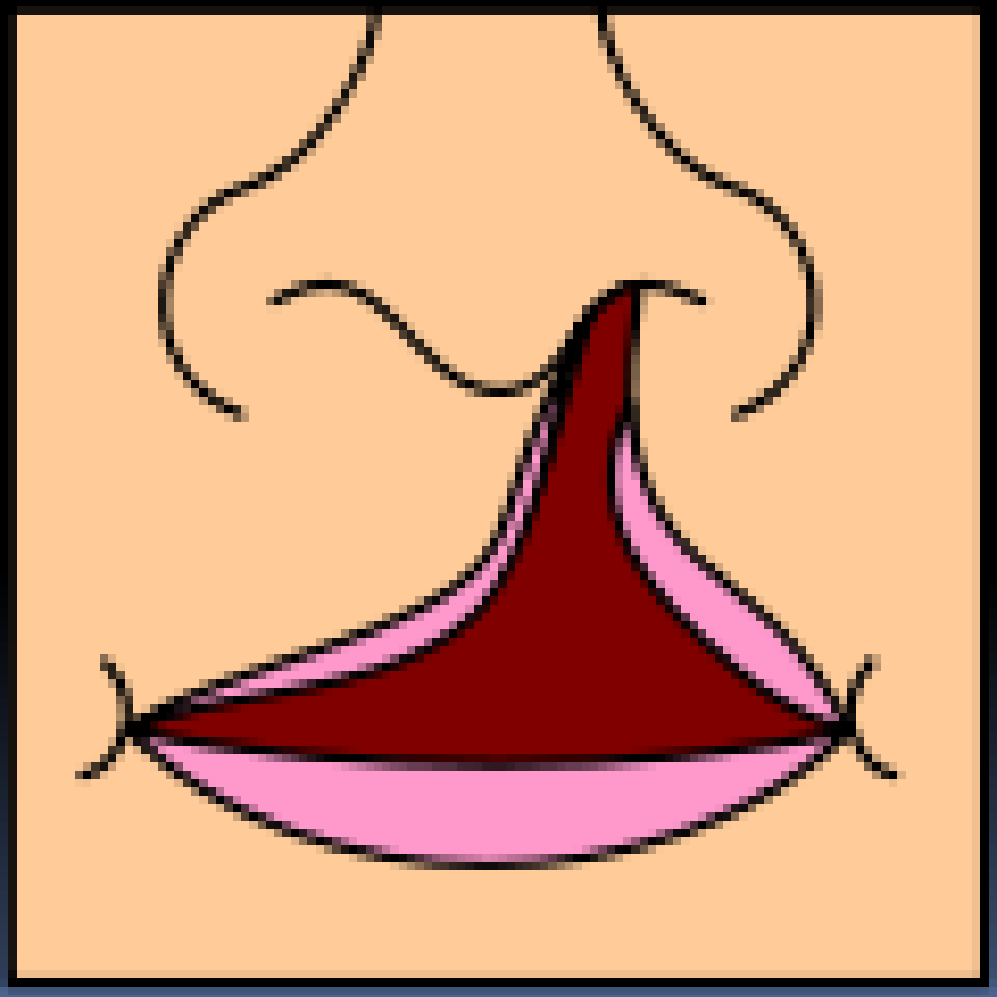
A microform cleft can appear as small as a little dent in the red part of the lip or look like a scar from the lip up to the nostril. In some cases muscle tissue in the lip underneath the scar is affected and might require reconstructive surgery. It is advised to have newborn infants with a microform cleft checked with a craniofacial team as soon as possible to determine the severity of the cleft.

If the cleft does not affect the palate structure of the mouth it is referred to as cleft lip. Cleft lip is formed in the top of the lip as either a small gap or an indentation in the lip (partial or incomplete cleft) or it continues into the nose (complete cleft). Lip cleft can occur as a one sided (unilateral) or two sided (bilateral). It is due to the failure of fusion of the maxillary and medial nasal processes (formation of the primary palate).

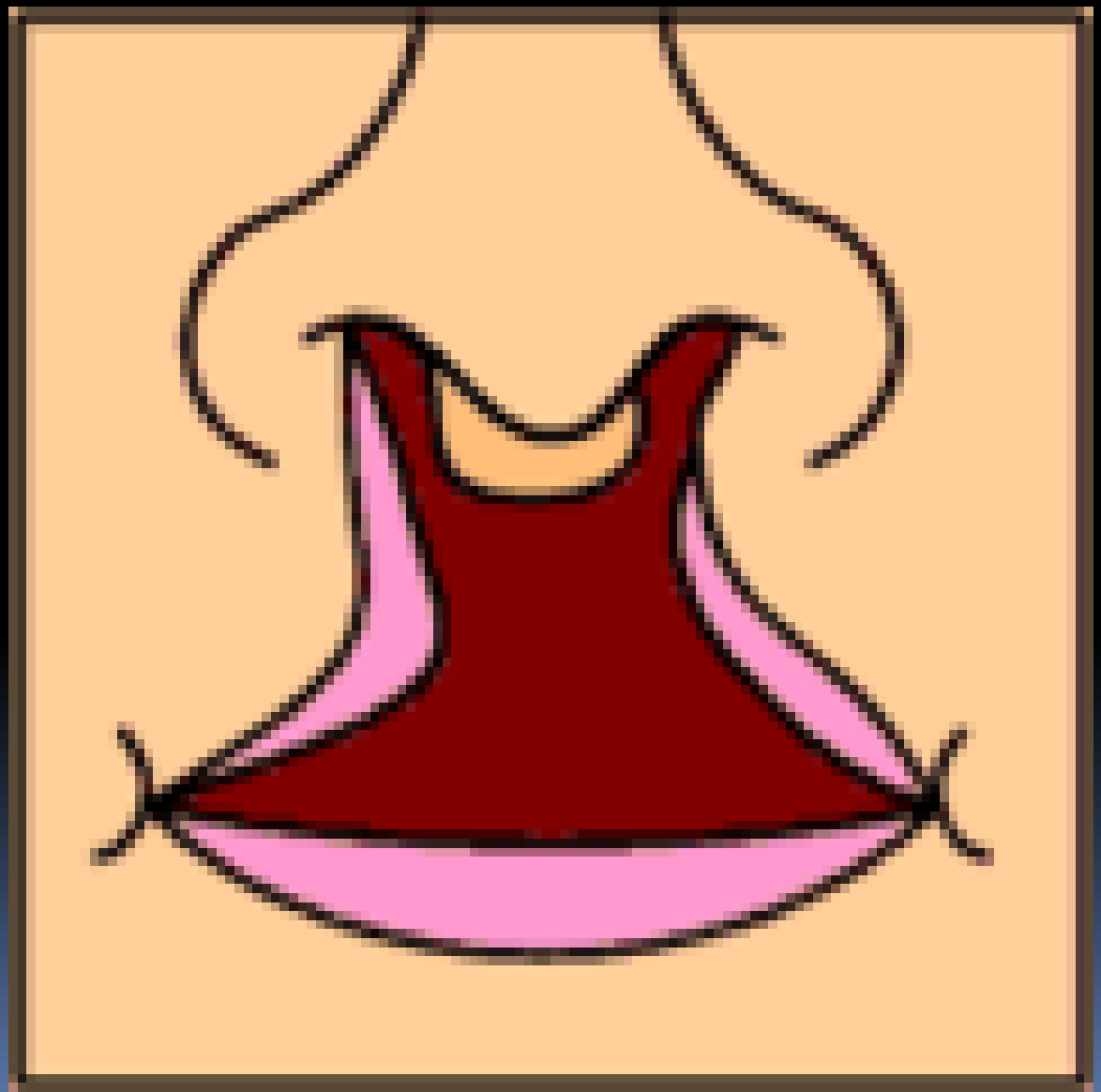
Incomplete cleft lip

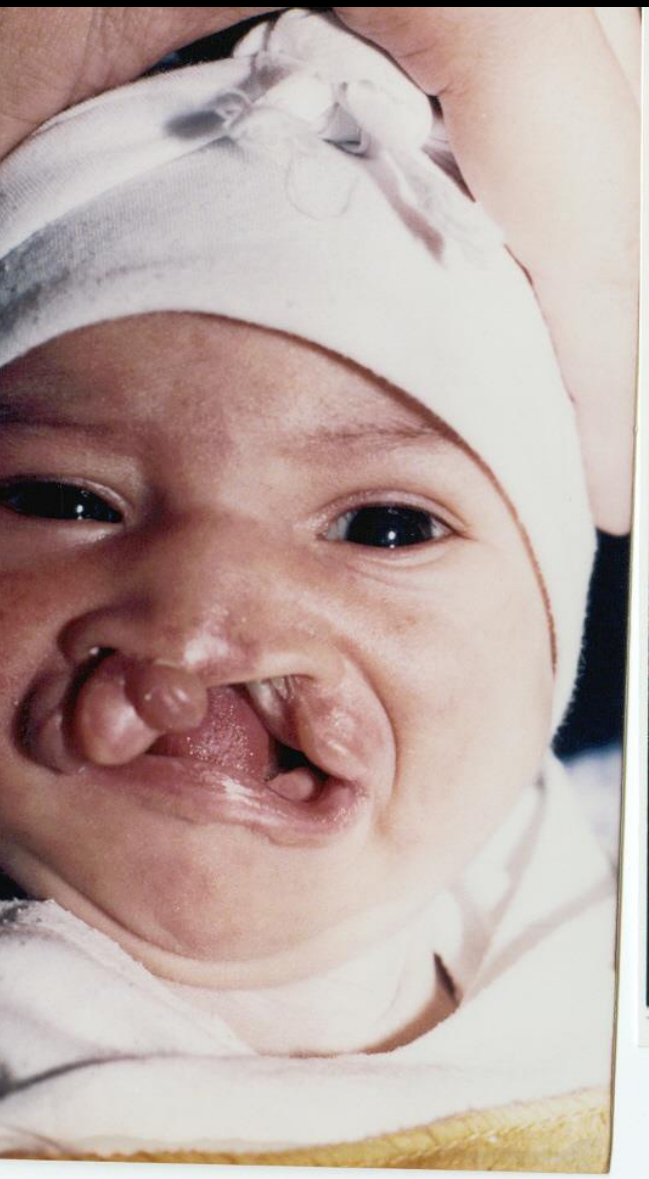


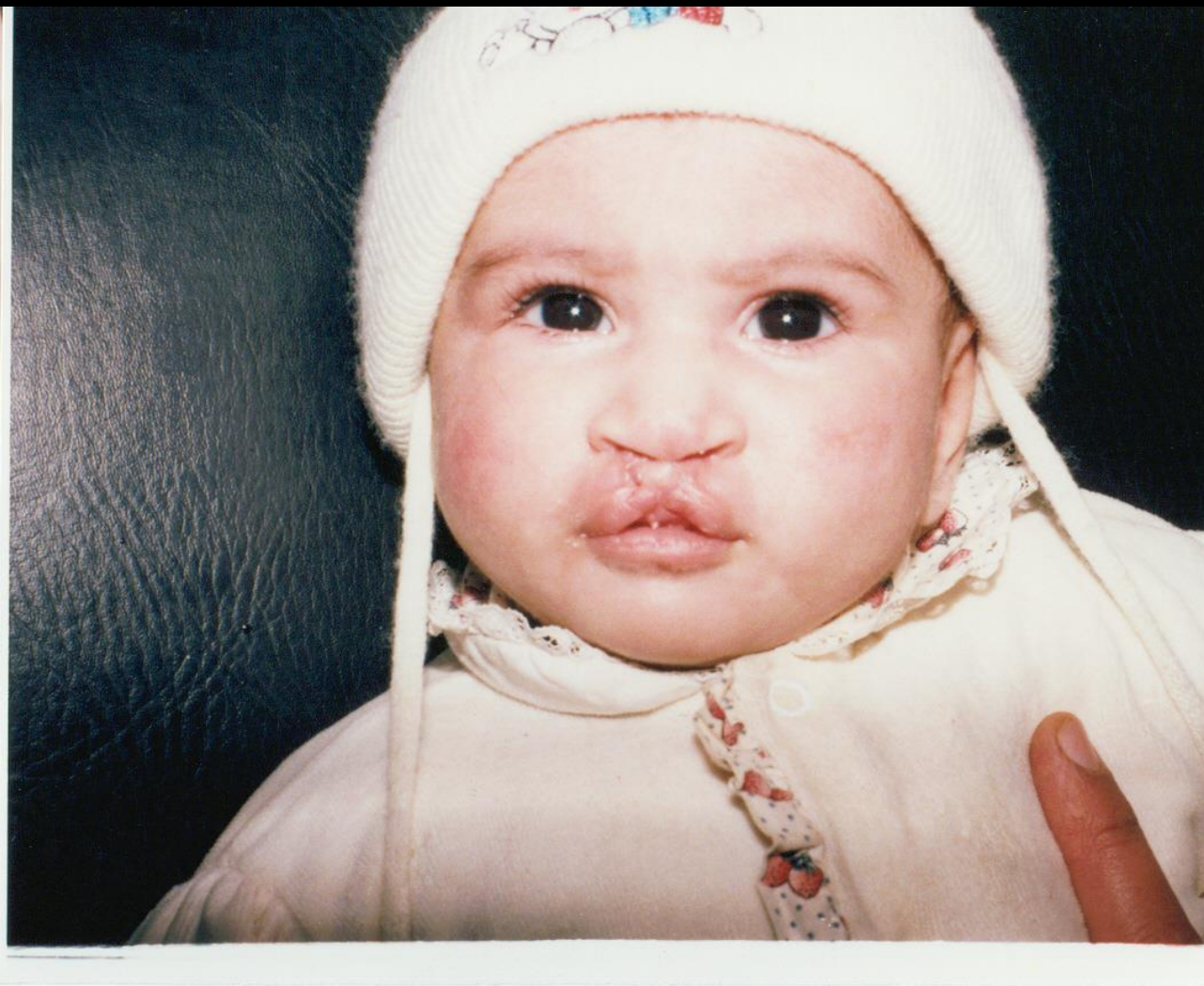
Complete cleft lip



Bilateral cleft lip







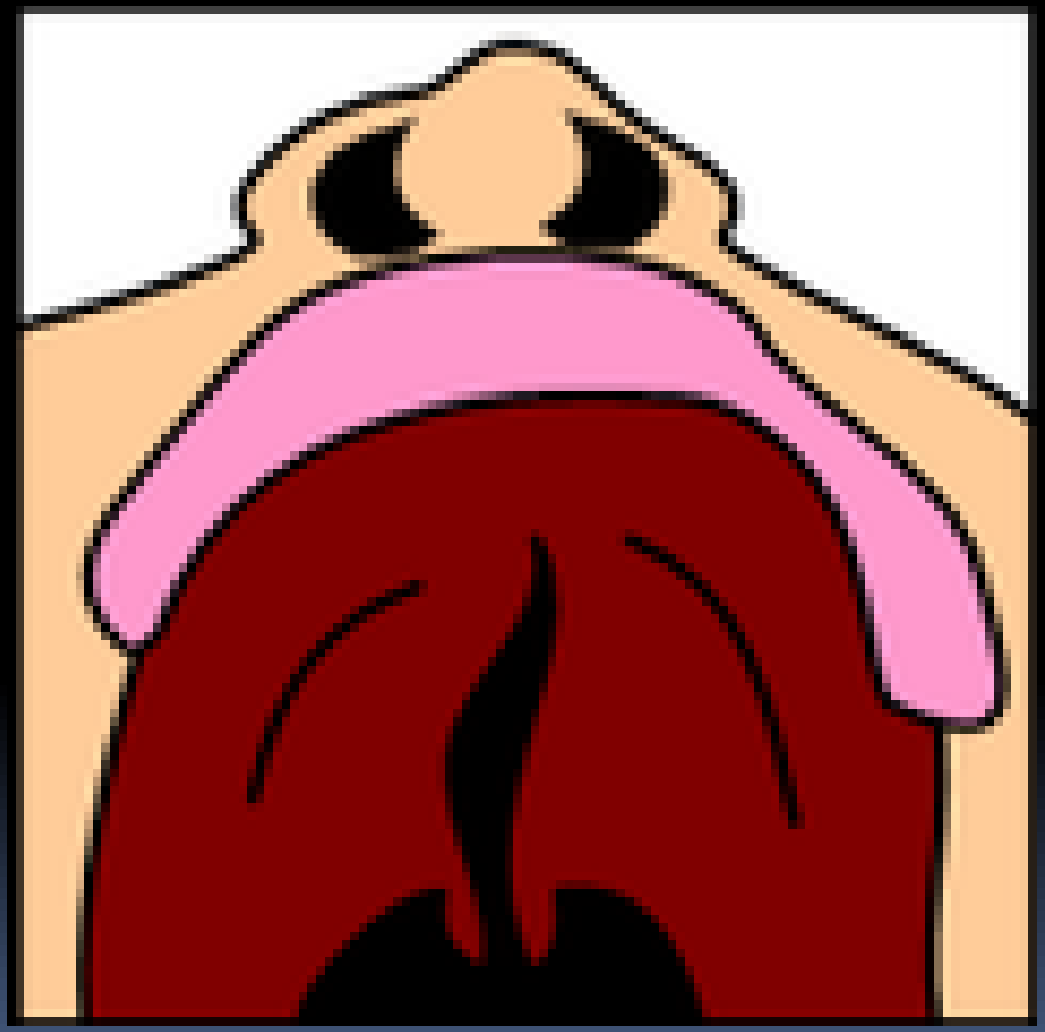
Cleft palate

is a condition in which the two plates of the skull that form the hard palate (roof of the mouth) are not completely joined. The soft palate is in these cases cleft as well. In most cases, cleft lip is also present. Cleft palate occurs in about one in 700 live births worldwide.

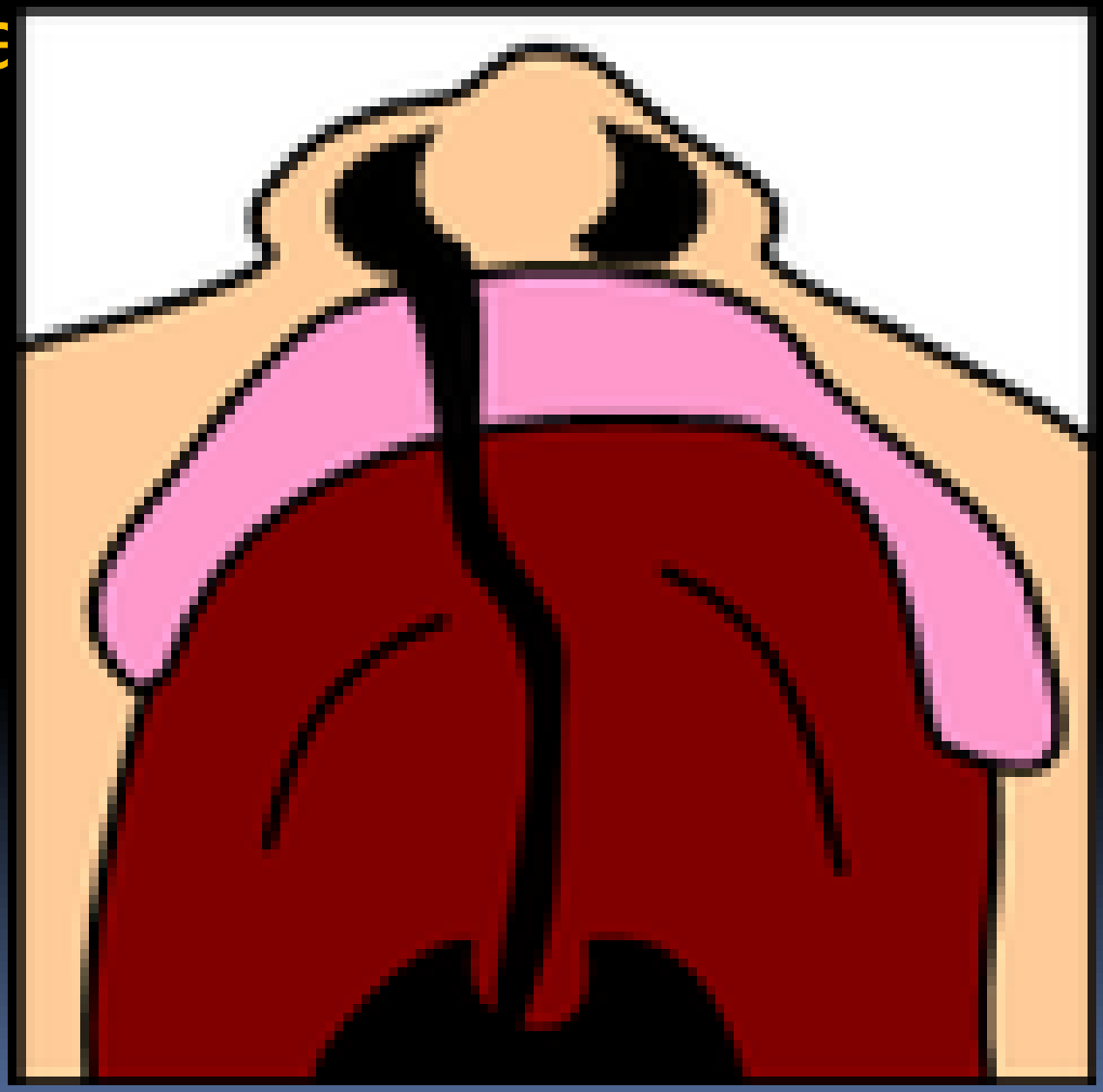
Palate cleft:

can occur as complete (soft and hard palate, possibly including a gap in the jaw) or incomplete (a 'hole' in the roof of the mouth, usually as a cleft soft palate). When cleft palate occurs, the uvula is usually split. It occurs due to the failure of fusion of the lateral palatine processes, the nasal septum, and/or the median palatine processes (formation of the secondary palate).

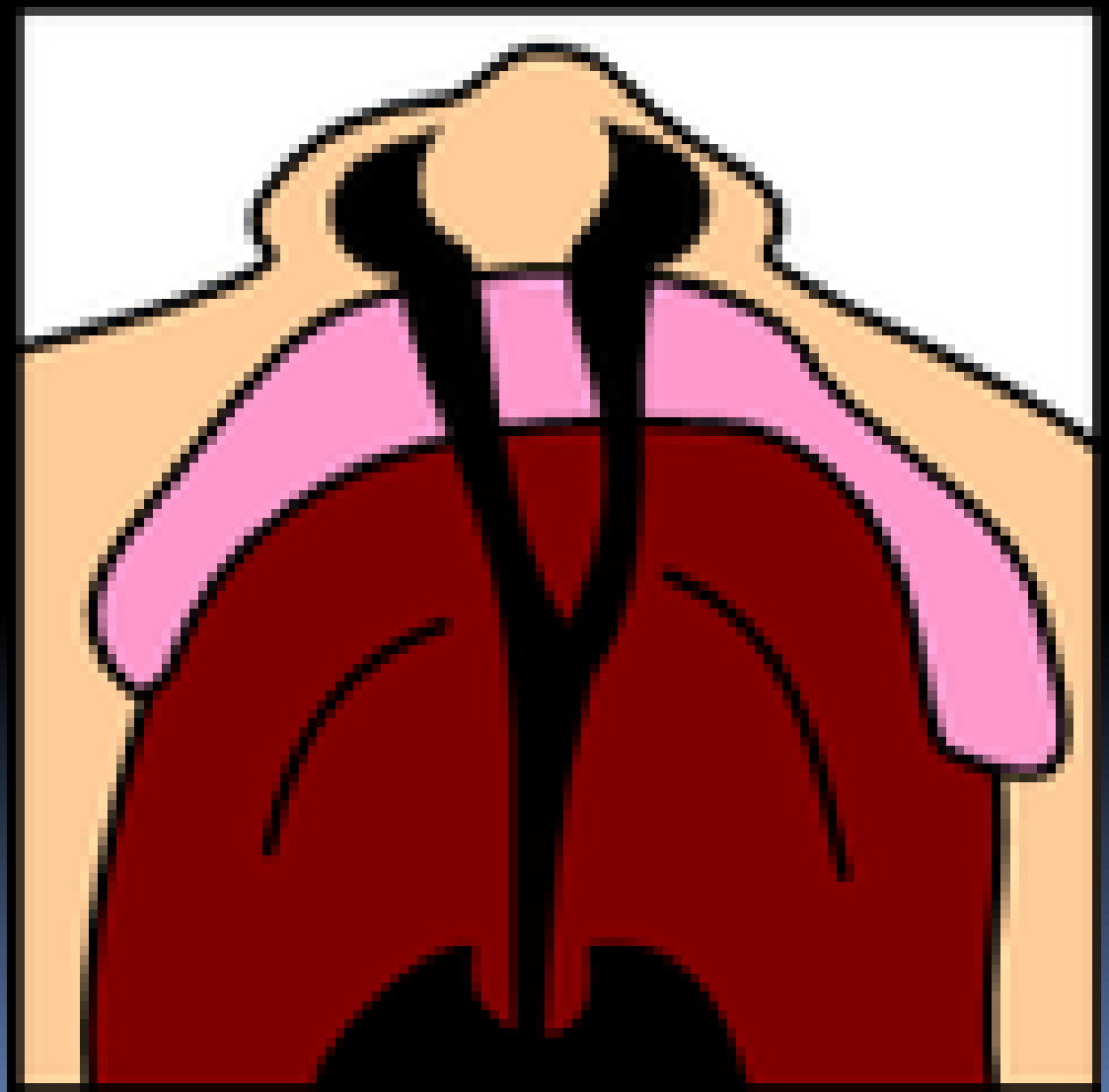
Incomplete cleft palate



Complete unilateral cleft pala



Bilateral complete cleft palate



Submucous cleft palate (SMCP) can also occur, which is a cleft of the soft palate with a classic clinical triad of a bifid, or split, uvula which is found dangling in the back of the throat, a furrow along the midline of the soft palate, and a notch in the back margin of the hard palate.

Cleft palate problems

Cleft may cause problems with:
feeding, ear disease, speech and socialization.
Due to lack of suction, an infant with a cleft may have trouble feeding. An infant with a cleft palate will have greater success feeding in a more upright position. Gravity will help prevent milk from coming through the baby's nose if he/she has cleft palate.

Hearing and speech problems

Individuals with cleft also face many middle ear infections which may eventually lead to hearing loss.
The Eustachian tubes and external ear canals may be angled or tortuous, leading to food or other contamination of a part of the body that is normally self-cleaning

. Hearing is related to learning to speak. Babies with palatal clefts may have compromised hearing and therefore, if the baby cannot hear, it cannot try to mimic the sounds of speech. Thus, even before expressive language acquisition, the baby with the cleft palate is at risk for receptive language acquisition. Because the lips and palate are both used in pronunciation, individuals with cleft usually need the aid of a speech therapist.

Speech problems

Children with cleft palate typically have a variety of speech problems. Some speech problems result directly from anatomical differences such as velopharyngeal inadequacy. Velopharyngeal inadequacy refers to the inability of the soft palate to close the opening from the throat to the nasal cavity, which is necessary for many speech sounds, such as /p/, /b/, /t/, /d/, /s/, /z/, etc.[1] This type of errors typically resolve after palate repair

Cleft lip repair:

Within the first 2–3 months after birth, surgery is performed to close the cleft lip. While surgery to repair a cleft lip can be performed soon after birth, often the preferred age by Ralph Millard. Millard performed the first procedure at a Mobile Army Surgical Hospital (MASH) unit in Korea.[1]

Often an incomplete cleft lip requires the same surgery as complete cleft., following the "rule of 10s“ (the child is at least 10 weeks of age; weighs at least 10 pounds, and has at least 10g hemoglobin).

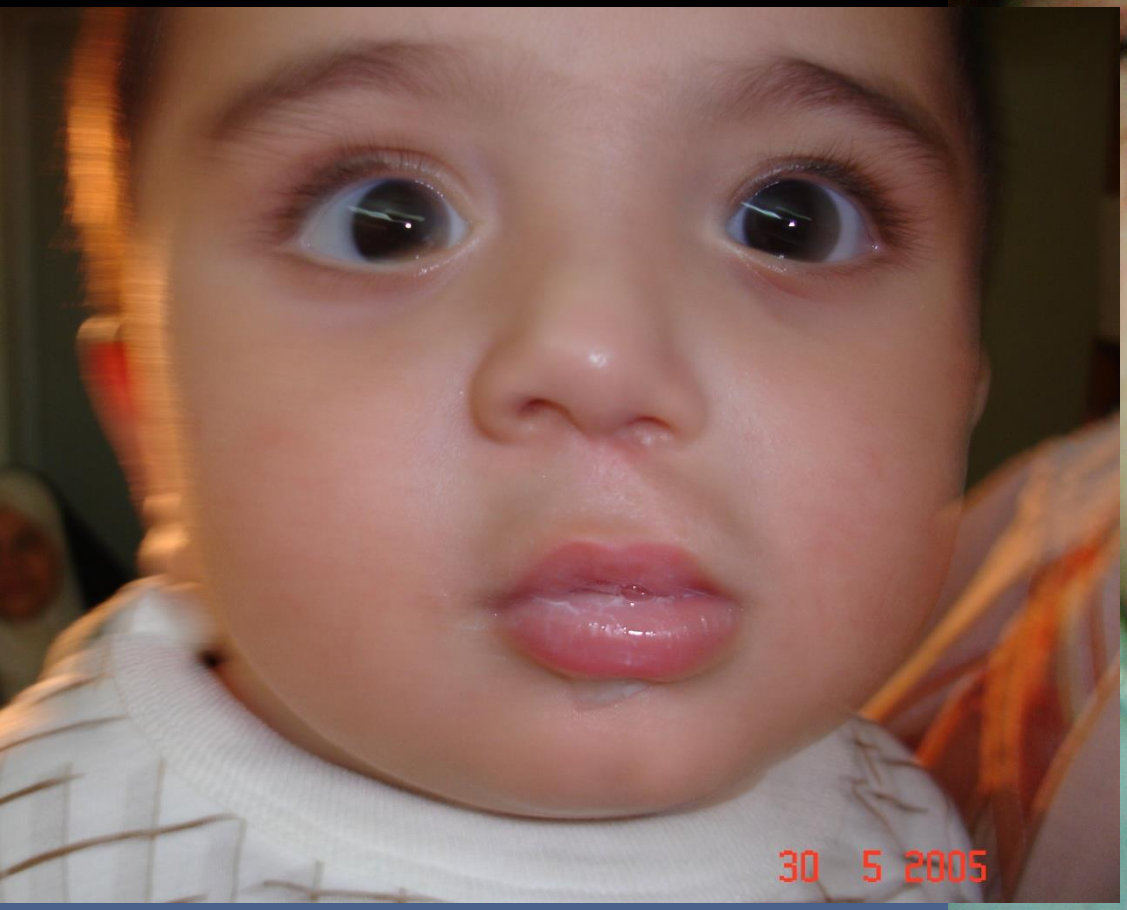
If the cleft is bilateral and extensive, two surgeries may be required to close the cleft, one side first, and the second side a few weeks later. The most common procedure to repair a cleft lip is the *Millard procedure* pioneered group of muscles required to purse the lips run through the upper lip. In order to restore the complete group a full incision must be made.

Secondly, to create a less obvious scar

Cleft palate repair

- Often a cleft palate is temporarily covered by a palatal obturator (a prosthetic device made to fit the roof of the mouth covering the gap).
- Cleft palate can also be corrected by surgery, usually performed between 6 and 12 months. Approximately 20–25% only require one palatal surgery to achieve a competent velopharyngeal valve capable of producing normal, non-hypernasal speech

- If the cleft extends into the maxillary alveolar ridge, the gap is usually corrected by filling the gap with bone tissue. The bone tissue can be acquired from the patients own chin, rib or hip.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