

Cleft Lip and Palate: Primary Repair



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Cleft lip and Palate

○ DEFINATION

The comprehensive treatment of cleft lip and palate deformities requires thoughtful consideration of the anatomic complexities of the deformity and the delicate balance between intervention and growth.

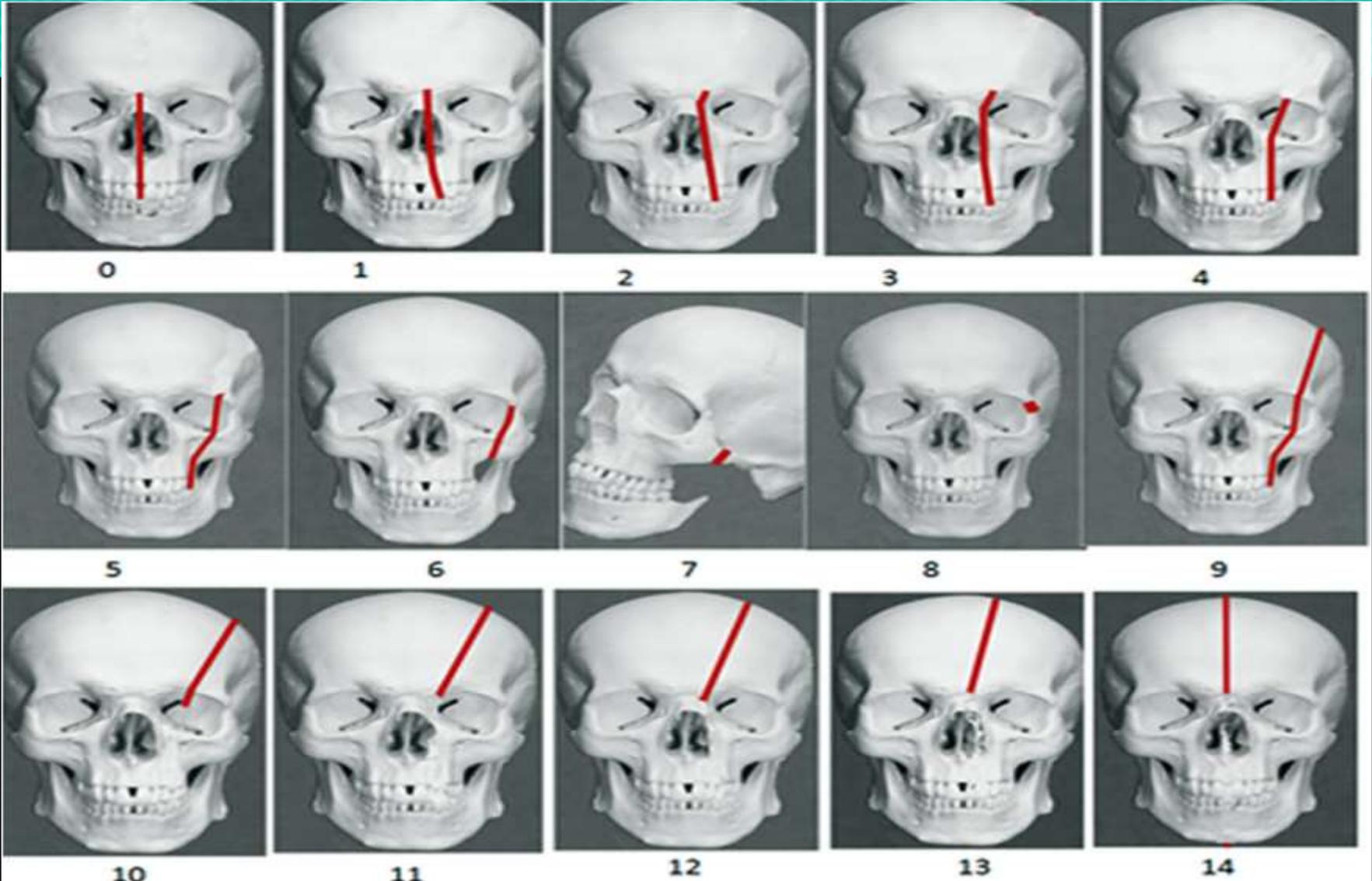
Tessier classification

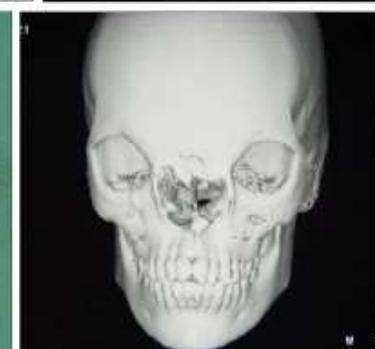
In 1976 Paul Tessier published a classification on facial clefts based on the anatomical position of the clefts. The different types of Tessier clefts are numbered 0 to 14. These 15 different types of clefts can be put into 4 groups, based on their position:

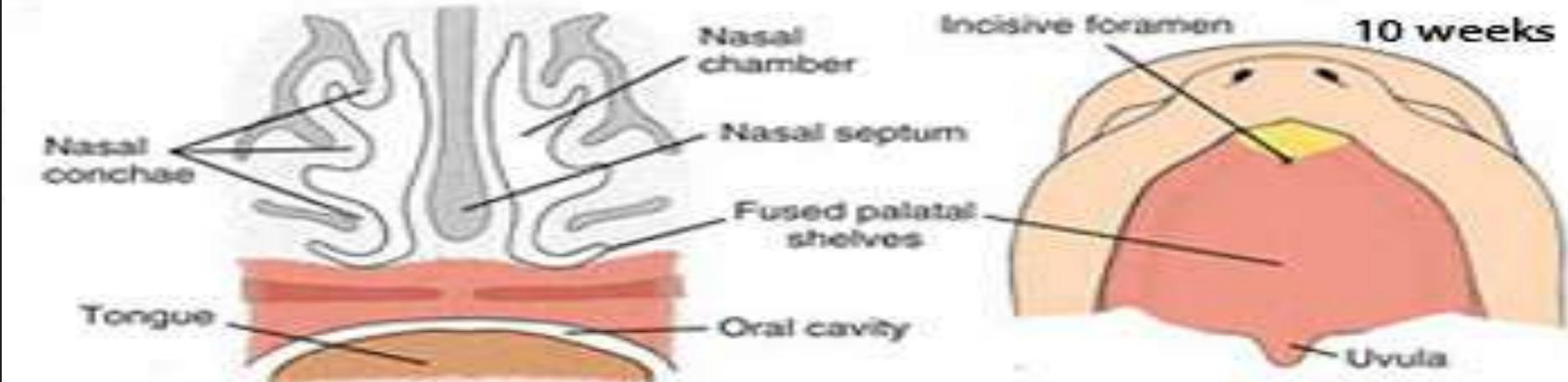
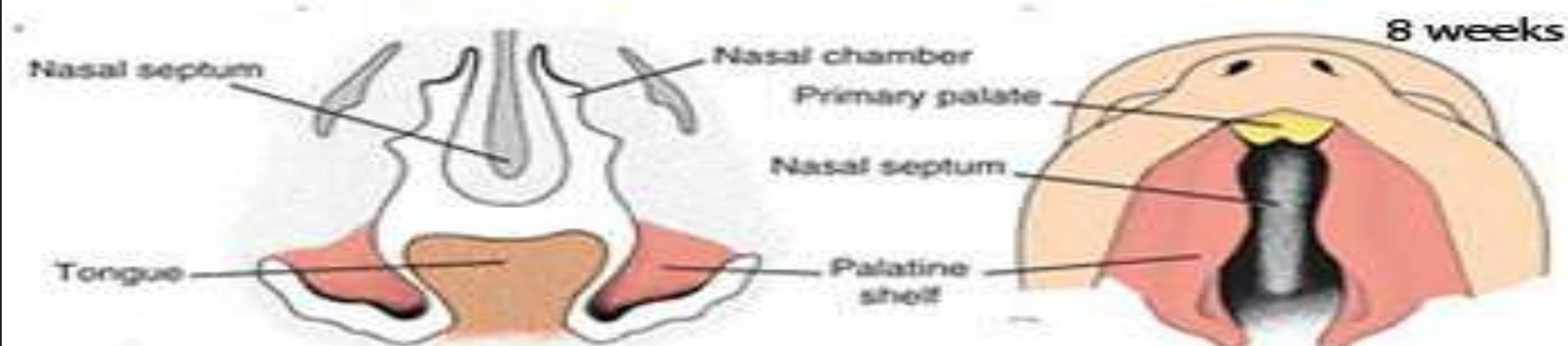
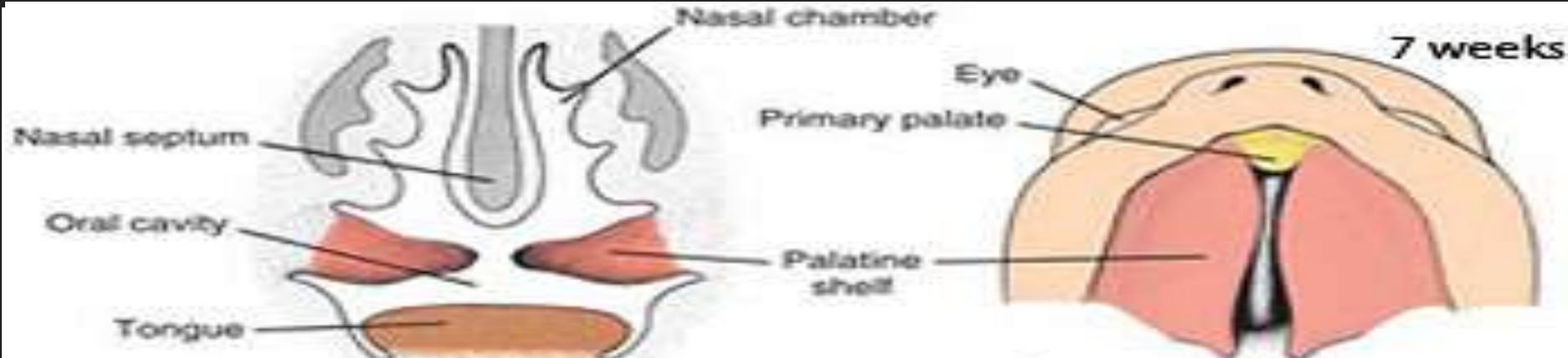
- midline clefts,
- paramedian clefts,
- orbital clefts
- lateral clefts.

The Tessier classification describes the clefts at soft tissue level as well as at bone level, because it appears that the soft tissue clefts can have a slightly different location on the face than the bony clefts.

TESSIR CLASSIFICATION TO CRANIOFACIAL CLEFT







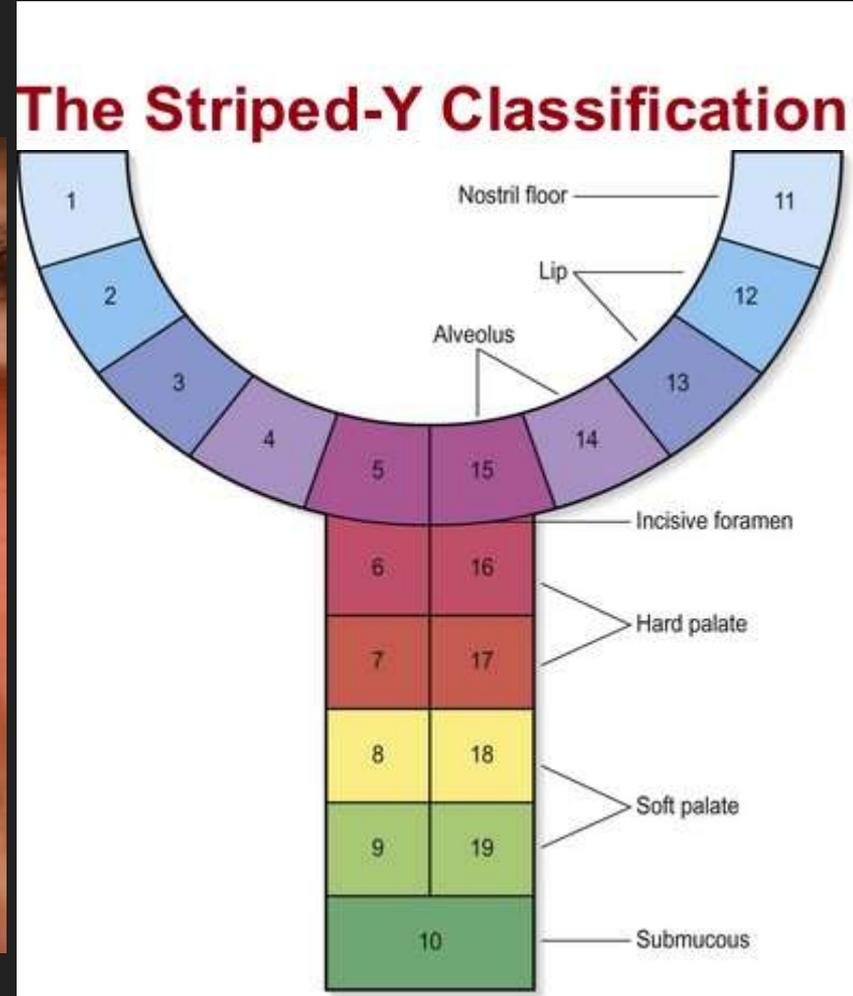
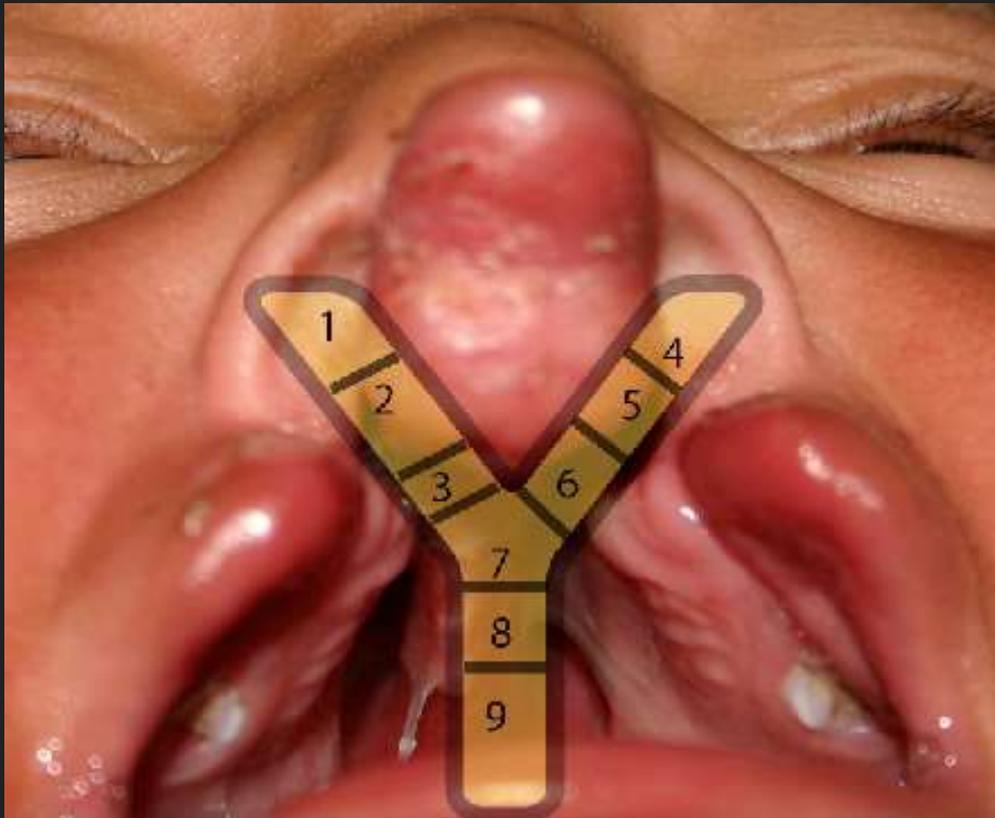
American Cleft Palate–Craniofacial Association (ACPA) classification (1962)

1. Clefts of the prepalate (cleft of lip and embryologic primary palate)
 - a. Cleft lip (cheiloschisis)
 - b. Cleft alveolus (alveoloschisis)
 - c. Cleft lip, alveolus, and primary palate (cheiloalveoloschisis)

2. Clefts of the palate (cleft of the embryologic secondary palate)
 - a. Cleft of the hard palate (uranoschisis)
 - b. Cleft of the soft palate (staphyloschisis or veloschisis)
 - c. Cleft of the hard and soft palate (uranostaphyloschisis)

CLEFT LIP AND PALATE

Classifications



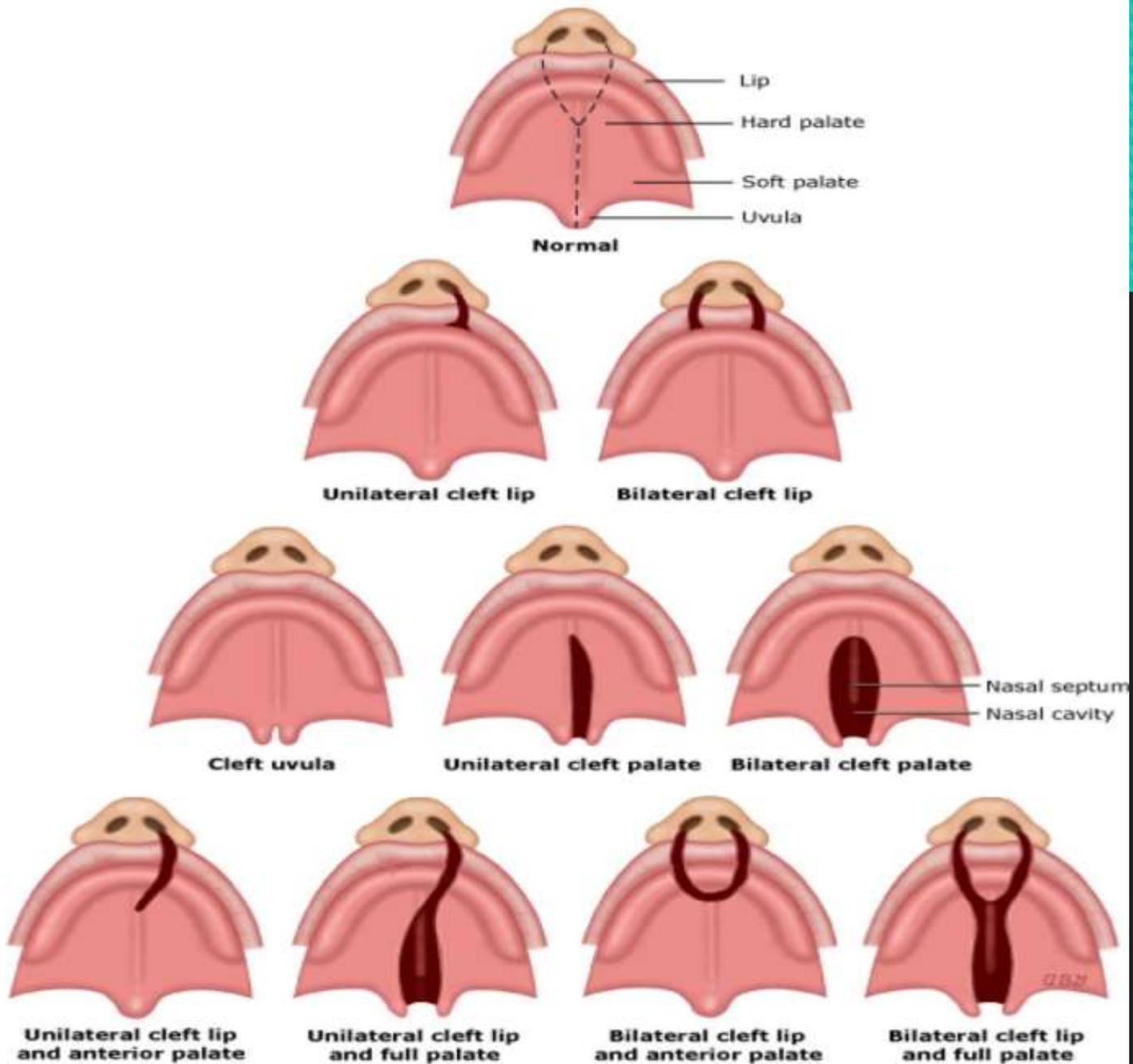
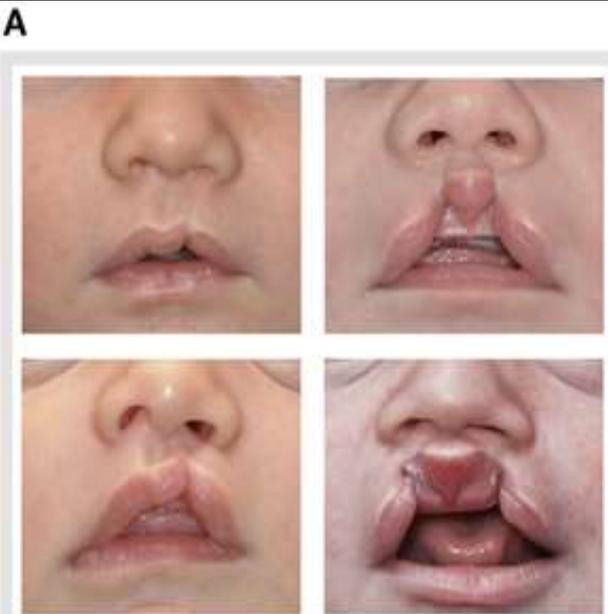


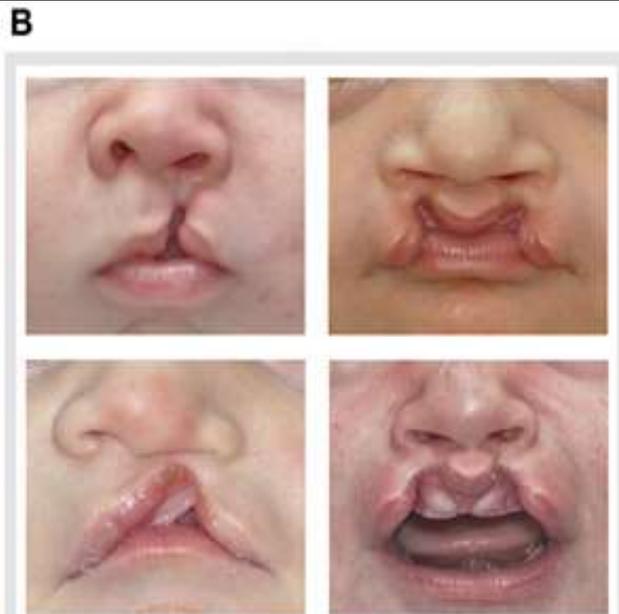
Figure 3: Classification of cleft lip and palate
(Source: Haug et al., 2012 www.uptodate.com)



Unilateral Left CL

Bilateral CL

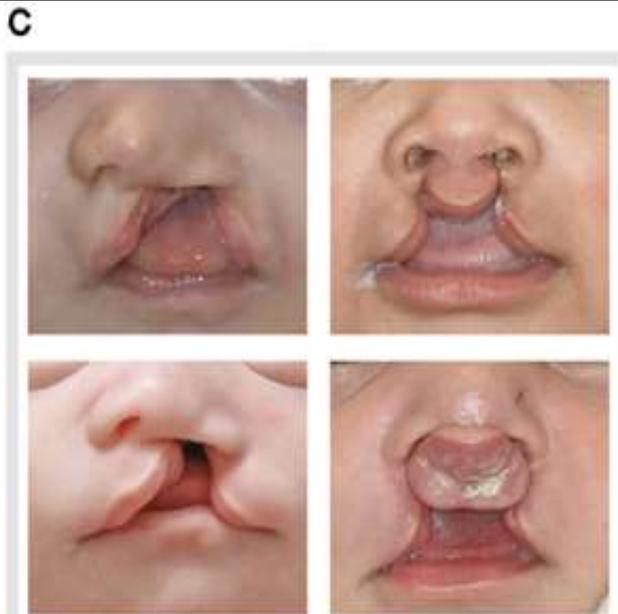
CL
 Subtotal
 < 1/2 CL
 1/3 CL



Unilateral Left CL

Bilateral CL

CL
 Subtotal
 > 1/2 CL
 2/3 CL



Unilateral Left CL

Bilateral CL

CL
 Total
 Complete CL
 3/3 CL

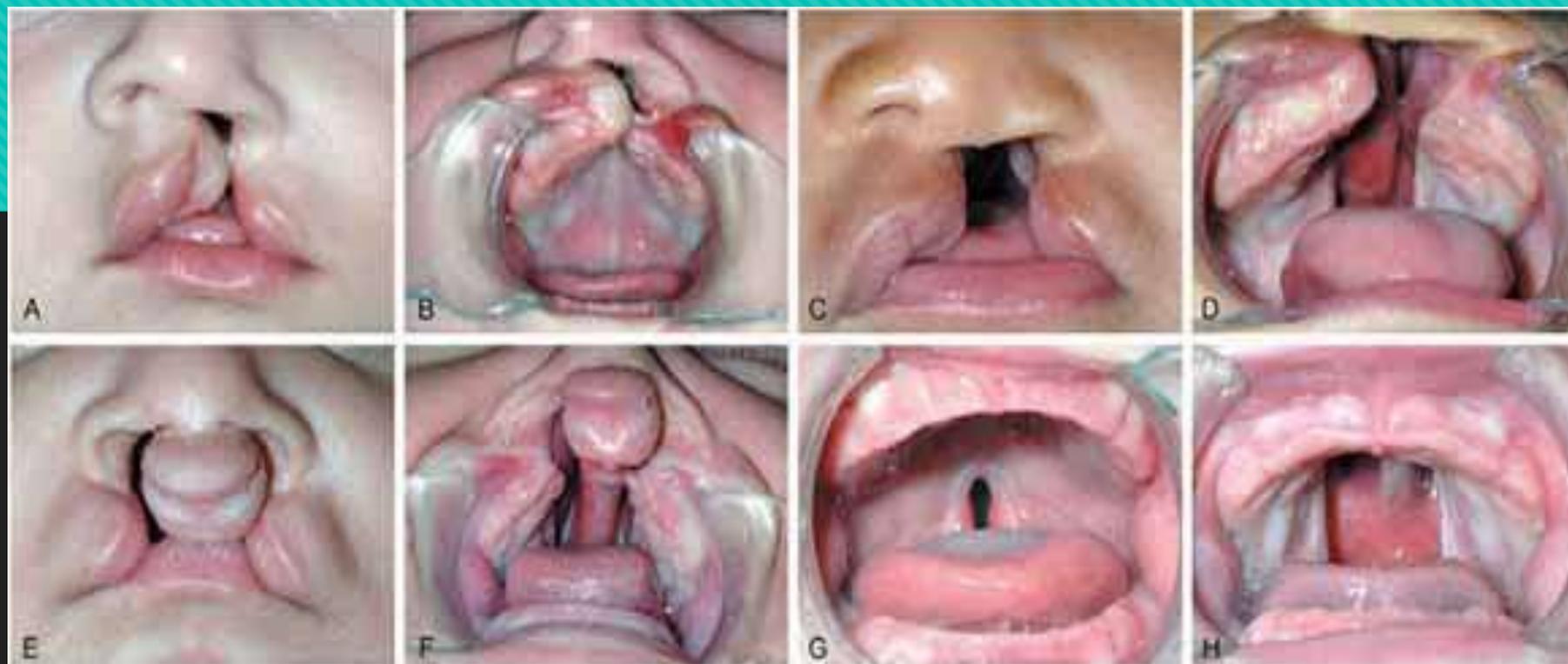
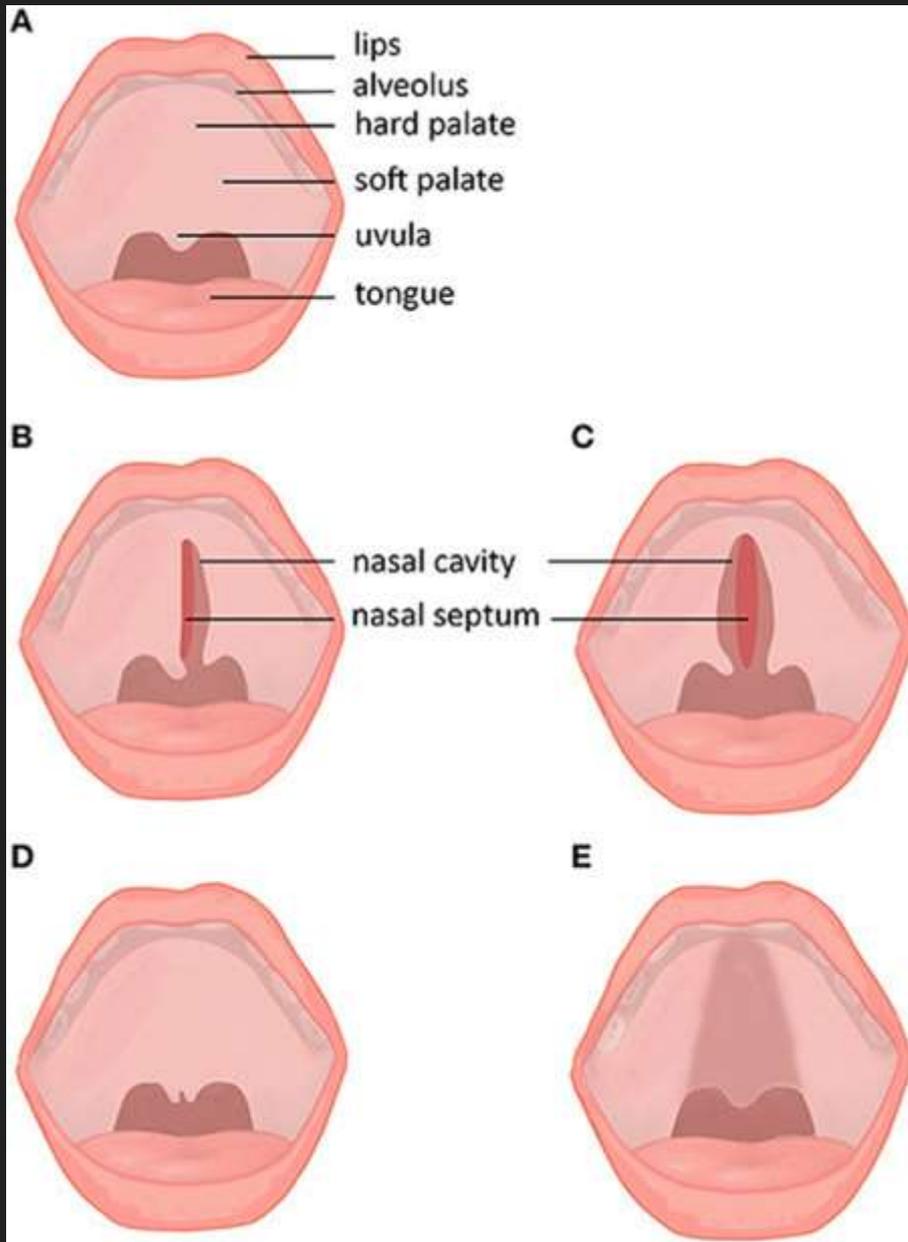


Figure 1- A and B - Complete unilateral cleft lip affecting the lip, alveolar ridge and anterior palate; C and D - Complete unilateral cleft lip and palate (affecting the lip, alveolar ridge and primary and secondary palate); E and F - Complete bilateral cleft lip and palate (affecting the lip, alveolar ridge and primary and secondary palate); G - Incomplete cleft palate (involving only the soft palate and uvula) and H - Complete cleft palate (completely involving the secondary palate)



Cleft lip and Palate

Specific goals of surgical care for children born with cleft lip and palate include the following:

- • normalized esthetic appearance of the lip and nose
- • intact primary and secondary palate
- • normal speech, language, and hearing
- • nasal airway patency
- • class I occlusion with normal masticatory function
- • good dental and periodontal health
- • normal psychosocial development

Aetiology

It is likely that one or more factors may act in a genetically liable individual ,

- steroids
- vitamin a deficiency.
- radiation.
- hypoxia.

these have been shown to produce clefts in animals

20% of babies with clefts have associated abnormalities, especially the hands, heart, feet and genitalia.

isolated cleft palate is also found in conjunction with

- downs syndrome
- pierre robin syndrome.



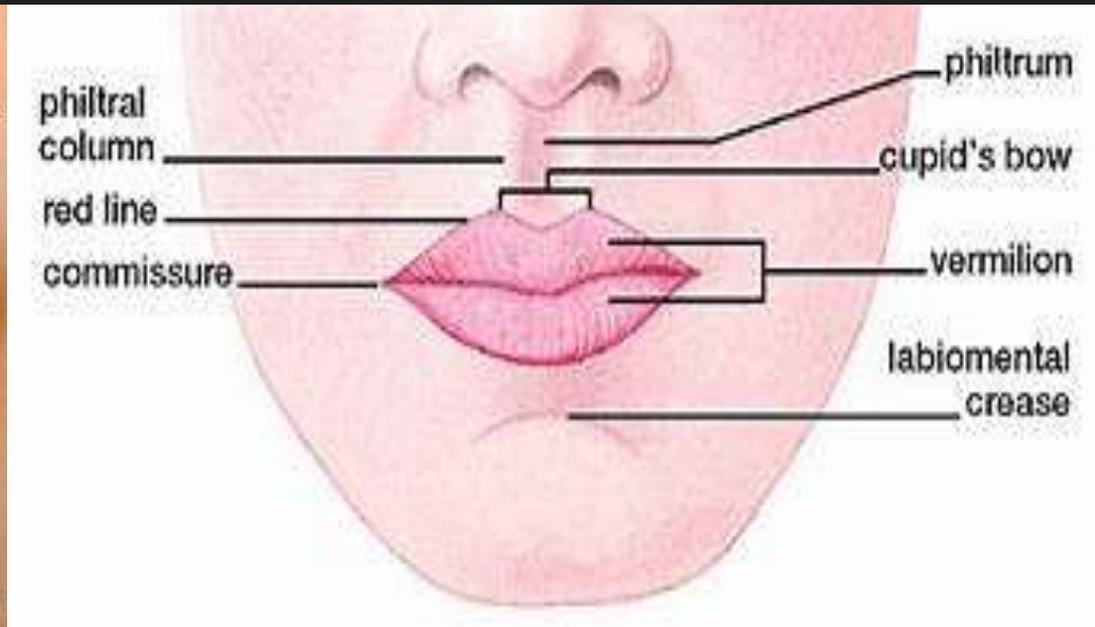
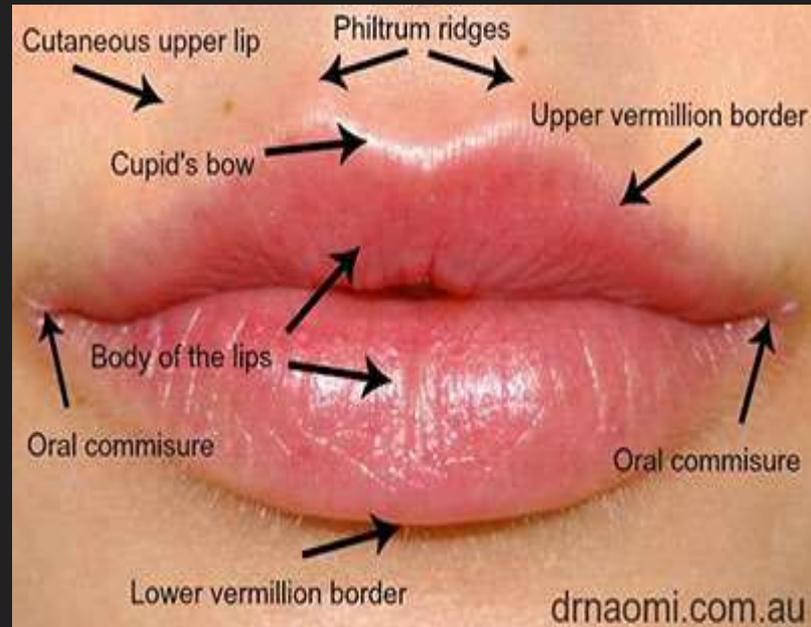
CLEFT LIP AND PALATE

Terminolog

- Ala of the nose
- Columella



nostril



Clinical Descriptions

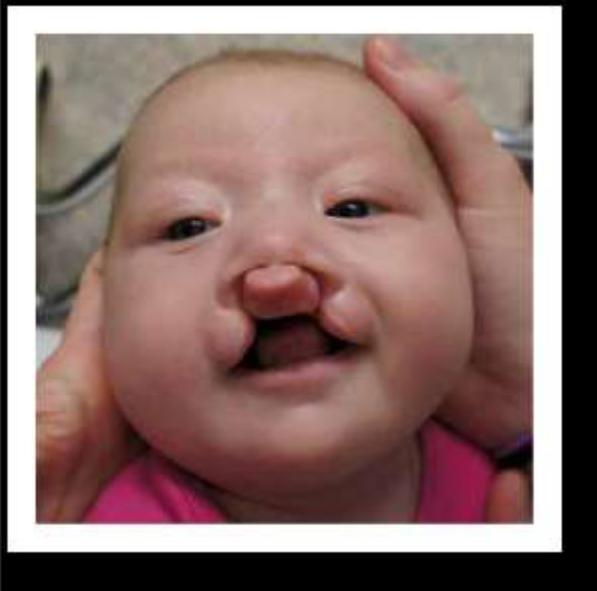
depressed nasal tip
displaced ala of the nose
horizontal nostril
slanted columella
short columella



Clinical Descriptions

Bilateral Cleft Lip and Palate

Premaxilla, prolabium are usually protruded.



Management.

Table 42-1 Staged Reconstruction of Cleft Lip and Palate Deformities

| <i>Procedure</i> | <i>Timing</i> |
|---|--|
| Cleft lip repair | After 10 weeks |
| Cleft palate repair | 9–18 months |
| Pharyngeal flap or pharyngoplasty | 3–5 years or later based on speech development |
| Maxillary/alveolar reconstruction with bone grafting | 6–9 years based on dental development |
| Cleft orthognathic surgery | 14–16 years in girls, 16–18 years in boys |
| Cleft rhinoplasty | After age 5 years but preferably at skeletal maturity; after orthognathic surgery when possible |
| Cleft lip revision | Anytime once initial remodeling and scar maturation is complete but best performed after age 5 years |

Management.

■ Birth ---3 months of age

Feeding Problems

- baby can take his mother breast for feeding.
- consider large teats or special teats having rubber obturators.
- use of specially constructed plate to obturate the defect.

Malalignment of Maxillary arch

- This can be corrected by progressively constructed plate.
- The plate will also control their growth, and prevent their displacement by the tongue, thus providing a good base for lip repair.



Management.

■ at 3 months

lip repair, at a time when the body regain his double birth weight.

RULE OF 10

weight- 10 lbs,

age -- 10 weeks

Hb -- 10 mg/l.

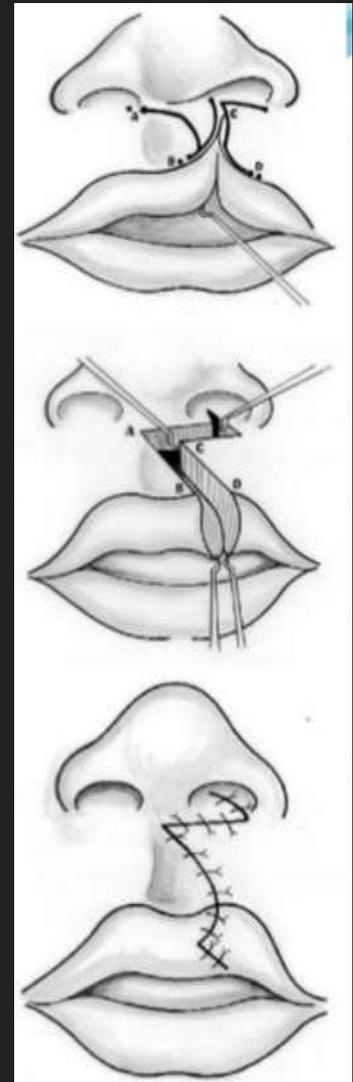
Surgical Repair of the Lip

The rotation advancement repair of the unilateral cleft lip deformity as described by Millard is the most commonly used method of repair at present in the USA.

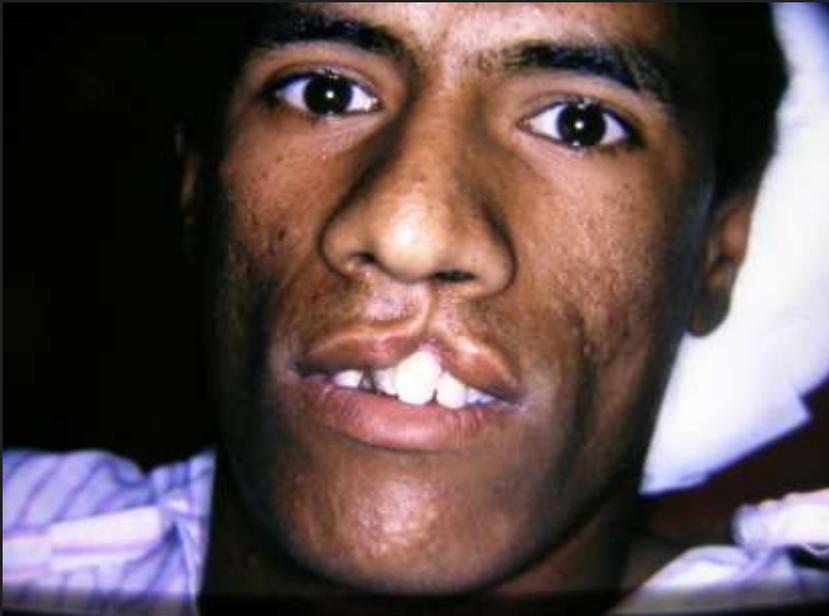
The main advantage of this technique is its flexibility and application. The rotation advancement technique relies on a “cut as you go” strategy that allows continuous modifications during the design and execution of the repair. It does not adhere to strict geometrical principles or measurements.

Another advantage is that the suture line approximates a new philtral column. The aesthetic philtral subunit is not violated, and this tends to create a scar that is more camouflaged.

Minimal tissue is discarded during the rotation advancement technique, and this tends to put less tension on the closure.







Lip Adhesion

- Some surgeons attempt to surgically approximate the segments of the cleft lip prior to definitive lip repair in an attempt to achieve a better relationship of both the lip structures and the dental arches.
- This is achieved by advancing small flaps of tissue across the cleft site. While some surgeons advocate the use of this technique in wide bilateral clefts, it is rarely performed in unilateral cases.
- Push back of premaxilla and prolabium
- Three layer closure mucous membrane, muscle and skin



Bilateral Lip Repair

- Bilateral cleft lip repair can be one of the most challenging technical procedures performed in children with clefts.
- The lack of quality tissue present and the widely displaced segments are major challenges to achieving exceptional results, but superior technique and adequate mobilization of the tissue flaps usually yields excellent esthetic results
- Additionally the columella may be quite short in length, and the premaxillary segment may be significantly rotated.
- Adequate mobilization of the segments and attention to the details of only using appropriately developed tissue will yield excellent results even in the face of significant asymmetry.

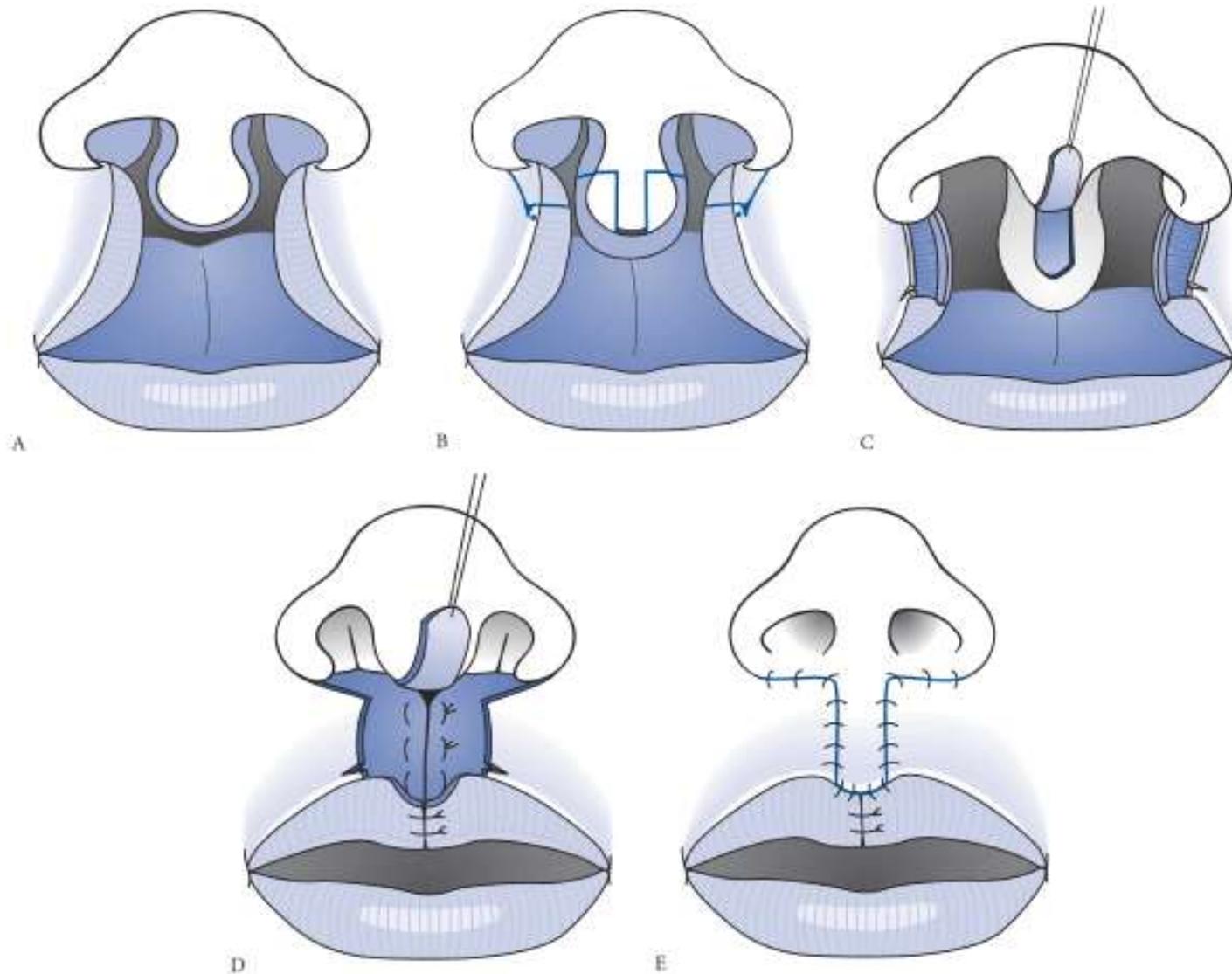


FIGURE 42-7 A, The bilateral cleft of the lip and maxilla shown here is complete and highlights the hypoplastic tissue along the cleft edges. The importance of the nasal deformity is evident in the shorter columella and disrupted nasal complexes. B, Markings of the authors' preferred repair are shown with an emphasis on excision of hypoplastic tissue and approximating more normal tissue with the advancement flaps. C, A new philtrum is created by excising the lateral hypoplastic tissue and elevating the philtrum superiorly. Additionally the lateral advancement flaps are dissected into three distinct layers (skin, muscle, and mucosa). Nasal floor reconstruction is also performed. D, The orbicularis oris musculature is approximated in the midline with multiple interrupted and/or mattress sutures. This is a critical step in the total reconstruction of the functional lip. There is no musculature present in the premaxillary segment, and this must be brought to the midline from each lateral advancement flap. The nasal floor flaps are sutured at this time as well. The new vermilion border is reconstructed in the midline with good white-roll tissue advanced from the lateral flaps. E, The final approximation of the skin and mucosal tissues is performed leaving the healing incision lines in natural contours of the lip and nose.

Surgical Repair of Hard and Soft Palate

- At 6, 12, 18 months,
before the child starts to speak

Cleft Palate Repair

- The term **primary palate** is used to describe the anatomic structures anterior to the incisive foramen (eg, the alveolar ridge, maxilla, piriform rim).
- The term **secondary palate** refers to those structures posterior to the incisive foramen.
- Therefore, when surgeons refer to the initial or “primary” cleft palate repair, they are actually describing the closure of the secondary palate structures that include the hard palate, soft palate, and uvula.
- The structures of the embryologic primary palate are reconstructed later in childhood during the cleft maxillary/alveolar bone graft procedure.
- There are two main goals of cleft palate repair during infancy:
 - 1. the water-tight closure of the entire oronasal communication involving the hard and soft palate;**
 - 2. the anatomic repair of the musculature within the soft palate that is critical for normal creation of speech.**
- When a cleft of the soft palate is present there are abnormal muscle insertions located at the posterior edge of the hard palate.
- Surgery must not simply be aimed at closing the palatal defect but rather at the release of abnormal muscle insertions. Muscle continuity with

Cleft Palate Repair

- The exact timing of repair of a palate cleft is controversial. **Generally the velum must be closed prior to the development of speech sounds that require an intact palate.**
- On average this level of speech production is observed by about 18 months of age in the normally developing child.
- If the **repair is completed after this time, compensatory nasal speech may** result.
- Repair completed **prior to this time allows for the intact velum to close effectively, appropriately separating the nasopharynx from the oropharynx** during certain speech sounds.
- The **problem of surgery during the growth phase resulting in maxillary growth restriction.**
- When repair of the palate is performed between 9 and 18 months of age, the incidence of associated growth restriction affecting the maxillary development is approximately 25%.

Surgical repair of the palate.

□ timing

at a time before the child starts to speak.

□ objectives

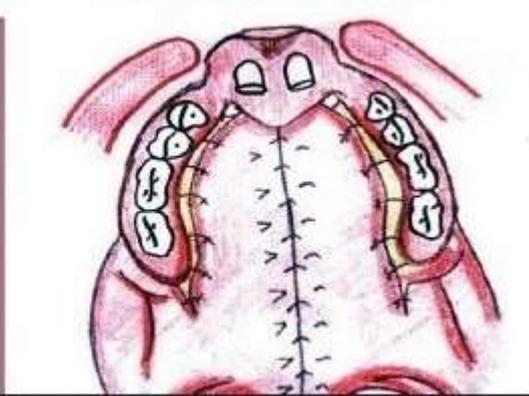
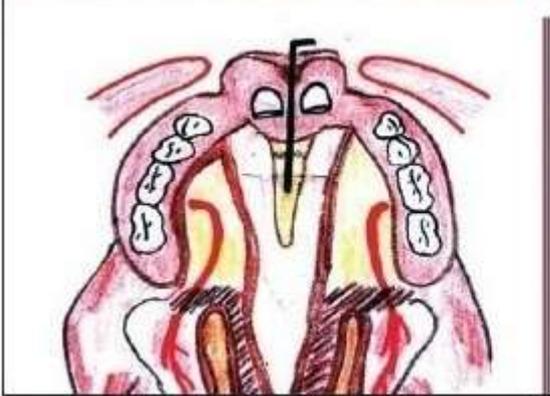
○ to produce a mobile muscular sling

○ producing a good velopharyngeal sphincter.

○ to improve Eustachian tube function and for this, a complete

dissection of the soft palate must be done and repositioning them

two layer closure.



a

b

c

d

Difficult Clefts

- ❑ we have patients who are not suitable for surgical closure of the palate either because **of too wide clefts** in such cases surgery will result in an unfunctional soft palate which is worse than if it is left alone.
- those who have grown up without surgical repair
- those who have unsuccessful surgery.

THOSE PATIENTS SHOULD FIT AN OBTURATOR .

Management.

At 4 years

Speech Therapy.

Velopharyngeal Insufficiency.

At 6 years

Second surgery on the palate

At 10 years

Orthodontic Treatment and Bone Graft to alv.

Orthodontic Treatment Alveolar Ridge Grafting and Closure

At the age of 10

▣ Alveolar ridge grafting and Closure

1. achieves stability of the arches and prevent collapse of alveolar segment.
2. preserve the health of the dentition
3. allows space for the canine and lateral incisor to erupt into the arch.
4. restores continuity not only of the alveolus but also of the maxilla and the piriform rim therefore supporting the alae of the nose.
5. closure of oro-nasal fistulae.

The use of expansion

most authors
unilateral

- segments
- expansion
nasal floor
- better pos
fistula.

if the alveolar
alignment



Figure 3- A- Haas type expander used for correcting the transversal deficiency of the maxillary arch. **B-** Fixed retainer used after rapid maxillary expansion

pecially in

losure of

pro-nasal

odontic

Time of Grafting

- bone grafting and closure of the cleft is done in the **mixed dentition** before eruption of canine.
 - at the age 8—12 years, where the canine root is $\frac{1}{2}$ - $\frac{2}{3}$ is developed.

f Grafting



rotation of the central incisor.

the **rotated and angulated position of the erupted central incisor reflects the morphology of the underlying bone**, this often result in crowding which can preclude normal oral hygiene.

if decision is made to rotate these incisors into alignment , **bone grafting is necessary before ortho-treatment** , in this case we have to consider the morphology of bone on the distal surface of the erupted central incisor before deciding ortho- treatment and before bone grafting to avoid unnecessary bone lose.

Time of Grafting

the presence of lateral incisor

- if the lateral incisor is mesial to the cleft , it often has adequate space for eruption.
- if the lateral incisor is located in the posterior segment , earlier grafting may be necessary to preserve the lateral incisor.

p. 864,

At 18 years

surgery to the maxilla

usually patients will develop class 111 malocclusion, this is due to **retarded growth of the maxilla as a result of interfering with the growth centers during palatal surgery.**

REFERENCES

- **peterson principle of oral and maxillofacial surgery 2nd edition**
- **Google images**
- **Most of the pictures are to Dr.Ali Alshawi Patients**

The background of the slide is a close-up of watermelon slices. The watermelon has a bright red flesh and a green rind with black seeds. In the center of the watermelon, there is a large yellow smiley face with two black dots for eyes and a simple black line for a mouth. A white speech bubble with a red border is positioned on the right side of the slide, containing the text "THANK YOU".

THANK
YOU