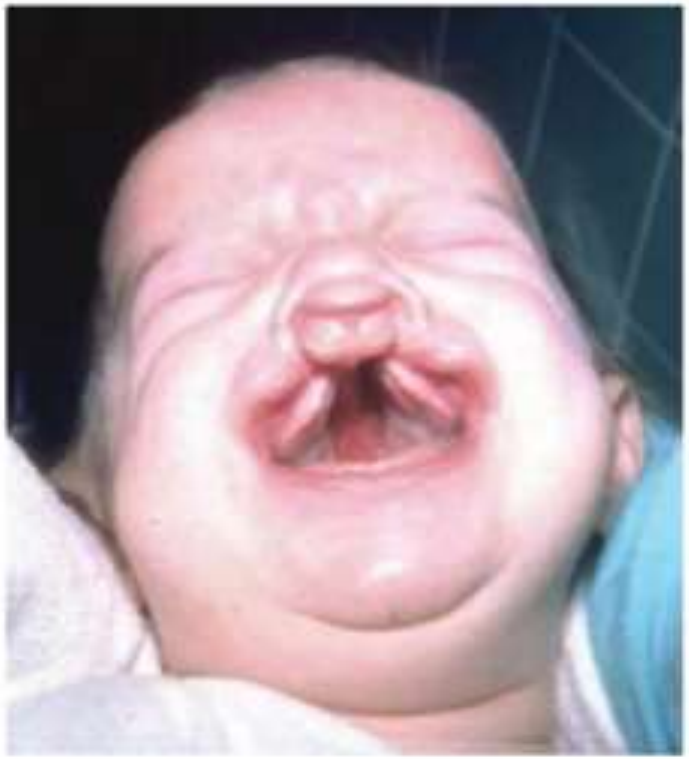
Cleft Lip & Cleft Palate

Cleft Lip & Palate

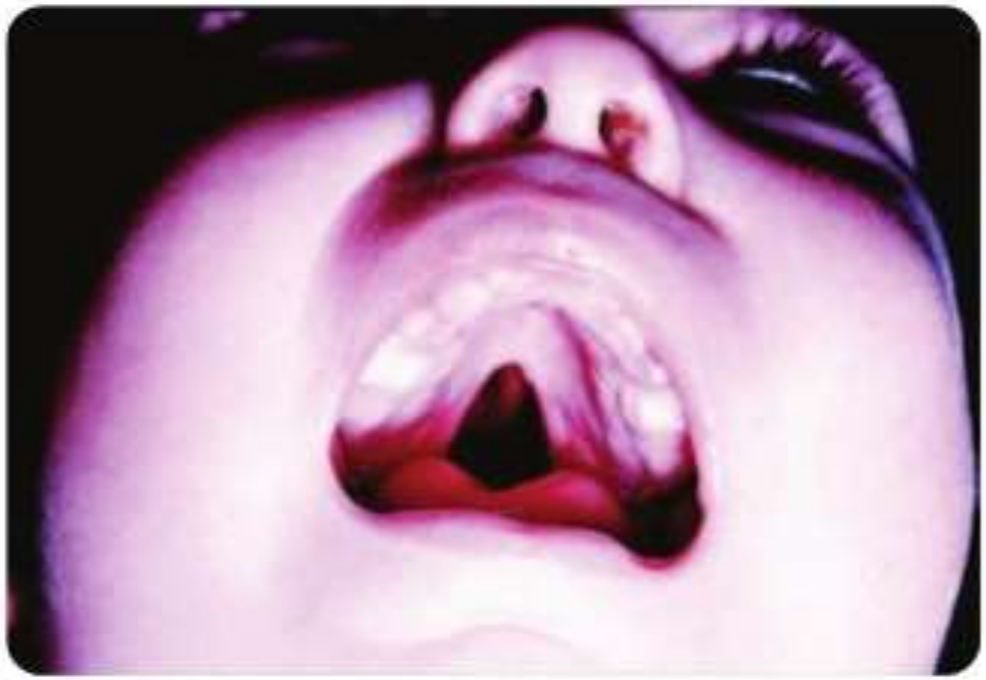
The term cleft lip & palate is commonly used to represent two types of malformation

- cleft lip with or without cleft palate (CL/P) (fig.1)
- cleft palate (CP) (fig.2)



Bilateral cleft of lip & palate

(fig.1)

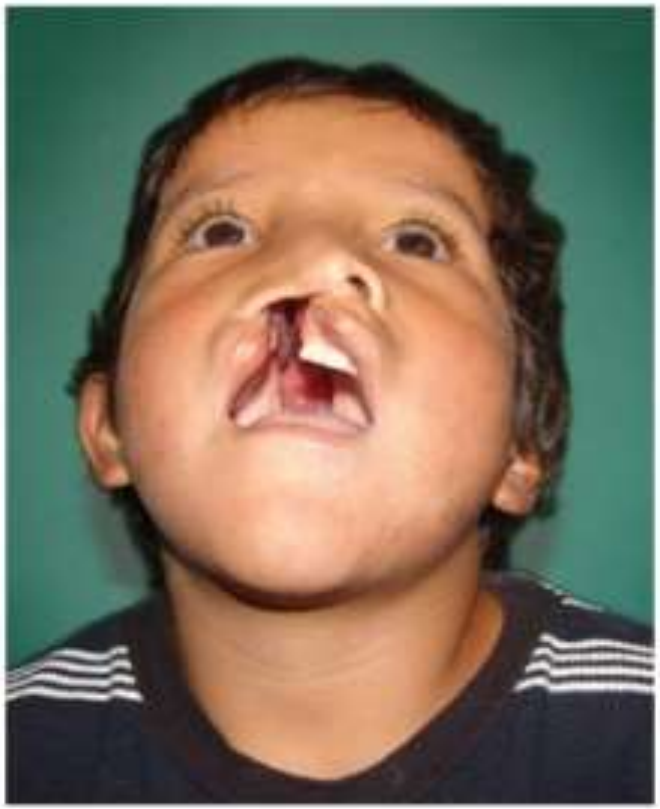


cleft of the hard & soft palates

(fig.2)

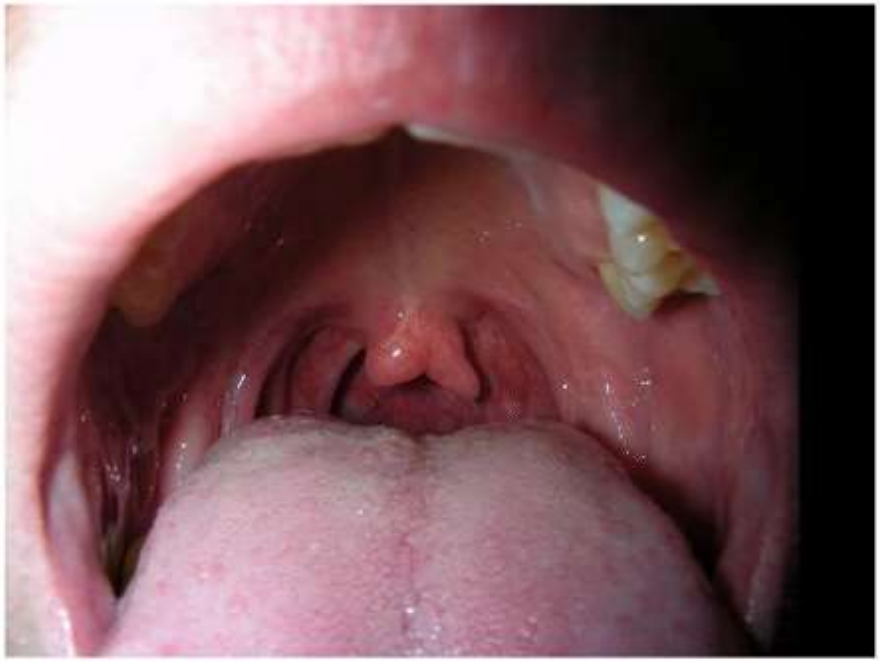
Unilateral cleft of lip

(fig.3)



cleft of lip & palate

(fig.4)



Bifid uvula

(fig.5)

Cleft lip, cleft palate, and the combination of cleft lip and palate are considered to have a multifactorial cause, including both environmental and genetic elements.

incidence

- common congenital malformation
- reported incidence varies from **1** in **500** to **1** in **2500** live births
- male:female **2:1**
- Asian population have higher incidence compared to the caucasian population

Incidence

- The approximate incidence is 1 in 700 live births, among them 25% are bilateral and 85% are associated with cleft palate. Isolated cleft palate occurs in 1 in 2000 live births .

- Negroids having least incidence (0.4/1000) and mongoloid and afghans(4.9/1000) having the highest incidence.

- Cleft lip is more common among males and cleft palate is more commoly among females.

- Unilateral clefts accounting for 80% of incidence and bilateral for remaining 20%.

- Among unilateral clefts, clefts involving left side are seen in 70% of cases.

Causes

- Oral clefts have been linked to genes located on more than several chromosomes including **1**, **2**, **4**, **6**, and **19**, among others

Causes

- maternal smoking (especially more than 20/day) and exposure to passive smoke
- Drugs: Accutane, phenytoin, warfarin ethanol
- maternal folic acid deficiency
- ingest large quantities of Vit A

Predisposing Factors

- *Increased maternal age*: women who conceive late have increased risk of having offsprings with clefts
- *Racial:* Mongoloids have greatest incidence of clefts
- *Blood supply*: Any factor that reduces blood supply to nasomaxillary areas during embryological development predisposes to clefts

Associated syndromes

Cleft lip may be associated with the following syndromes:

- Down's syndrome
- Wardenburg's syndrome (abnormities of pigmentation of hair,iris and skin,deafness)
- Vander Woude's syndrome(lips pits)
- Orofacial digital syndrome
- Treacher collins syndrome
- Pierre Robin syndrome
- Klippel-Feil syndrome

Method of Transmission

- Depends on the specific cause of the clefting.
- Multifactorial clefts can exhibit evidence of autosomal dominant, autosomal recessive, and sex-linked inheritance patterns
- spontaneous mutation or mutations in one or more genes.

Method of Transmission

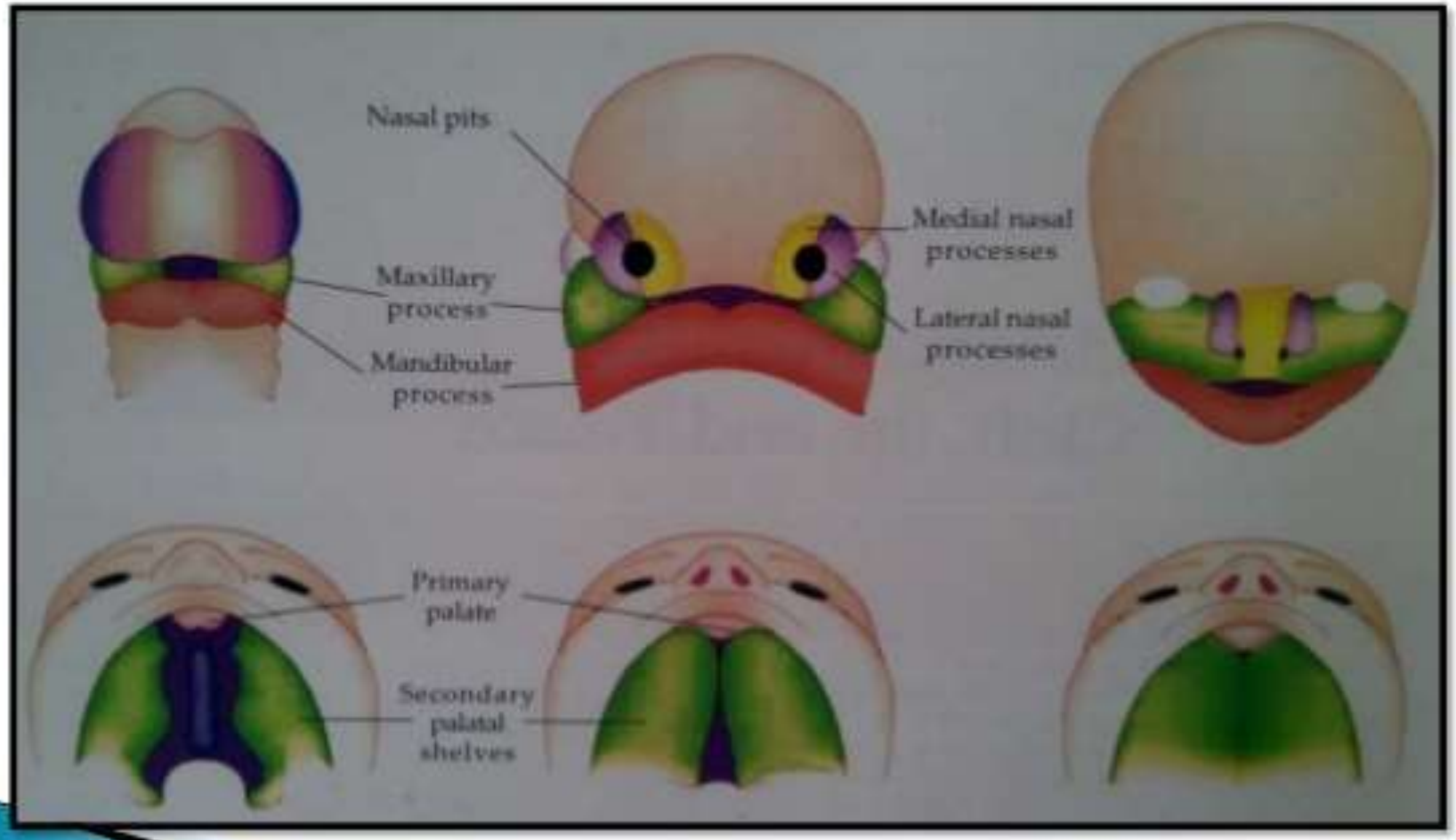
- If one of the parent has a cleft lip, his/her child face a risk of 20%
- If their is one child with cleft lip, the following child faces risk of 14%
- A non cleft parent with a cleft lip faces a risk of 4% for the following child

Pathogenesis

- The face and facial structures are formed out of three plates, each migrating toward a meeting point in the middle area of the face.

- The facial structures of the **orbicularis muscle** form the lip. They are joined at the philitrum lines.
- join by 4th week of pregnancy

- Maxillary process fuse with medial and lateral nasal processes to form upper lip and primary palate respectively



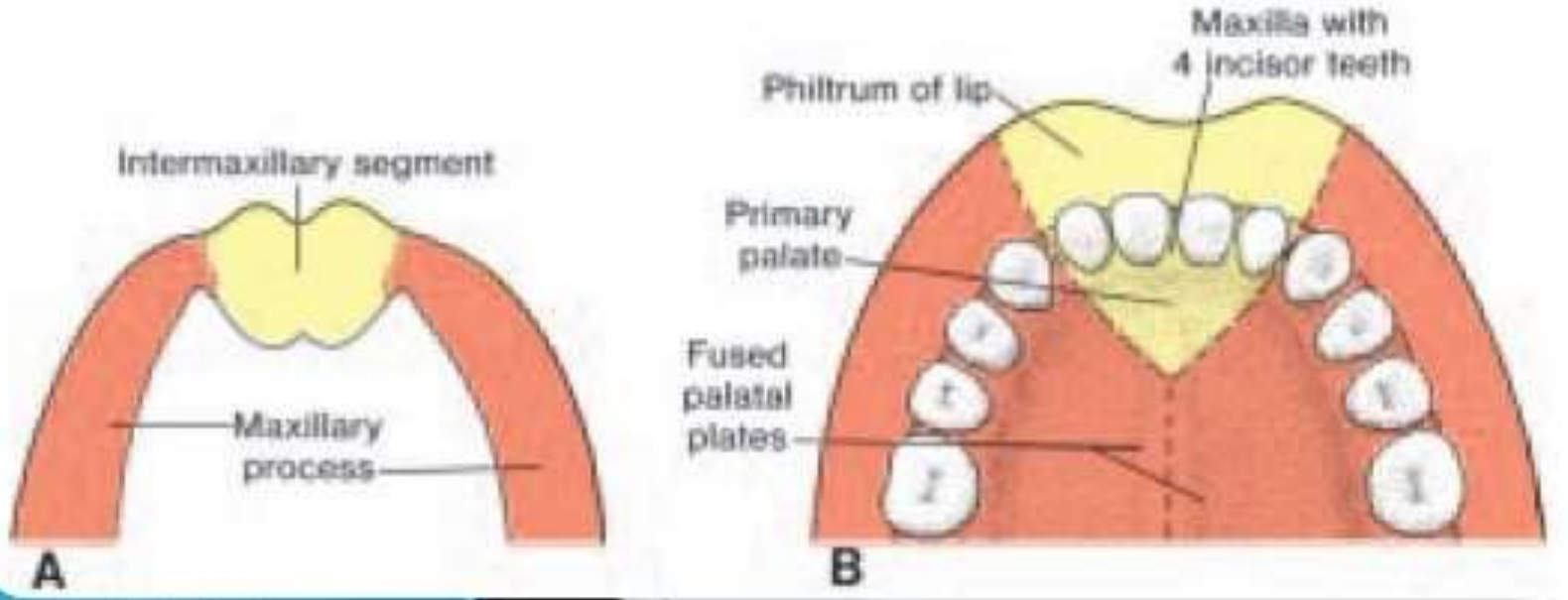
- The palate is then formed out of the structure that begins as the tongue and palate.
- Between the fourth and the eighth weeks of gestation, the tongue drops down and the palatal segments then move from the sides and toward the middle, fusing in the center.

Development of palate

Development begins in 6th week

Develops from-

1. Primary palate(from medial nasal process)
2. Secondary palate(from maxillary process)



- A cleft, therefore, is not something that is formed, so much as it is **something that does not form**.

Normal Process

6 Weeks

- Maxillary process
- Lateral nasal process
- Median nasal process

These three processes join and fuse to form the primary palate

Normal Process

7 Weeks

Median nasal process and maxillary process have fused creating upper lip and anterior maxillary alveolus

Normal Process

8 Weeks

Complex totally fused and mesodermal migration completed Tongue, which has been postured superiorly between lateral palatal shelves of maxilla, moves inferiorly allowing palatal processes to grow toward midline and fuse, form nasopalatine foramen to uvula

Normal Process

11 Weeks

Total palatal closure

Classification

- The Veau Classification system (table.1)
- The Striped-Y Classification system (fig.6)

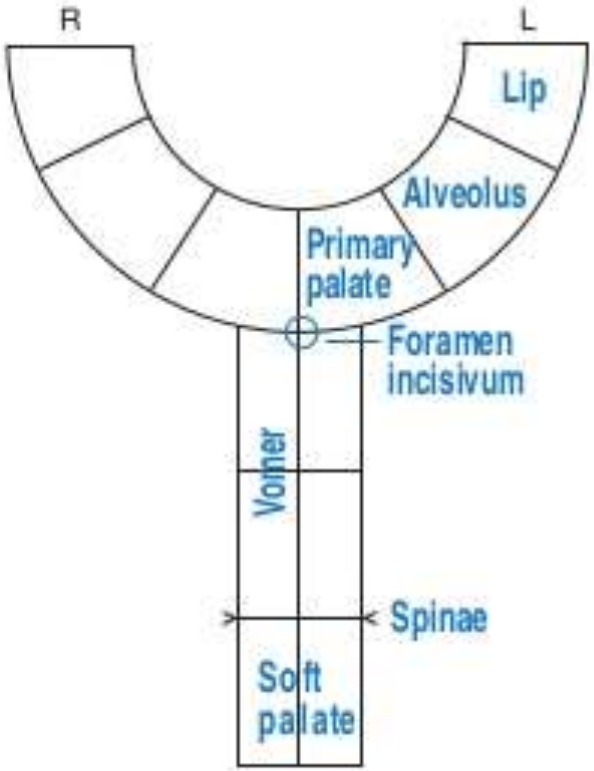
The Veau Classification system

Class	Description
I	Soft palate only
II	Hard & soft palate to the incisive foramen
III	Complete unilateral of soft, hard, lip, & alveolar ridge
IV	Complete bilateral of soft, hard, and/or lip and alveolar ridge

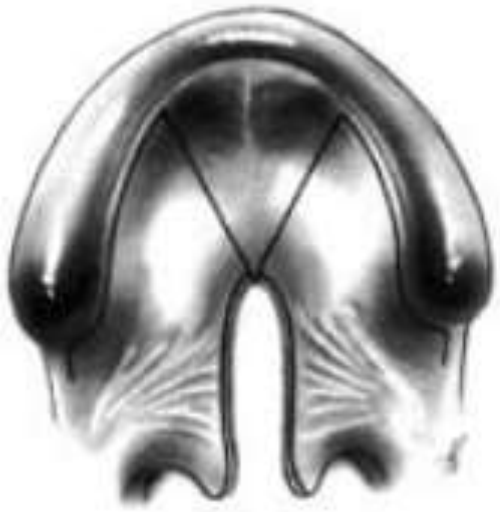
These descriptions can be modified with the words incomplete, right, left, one/third, and so on.

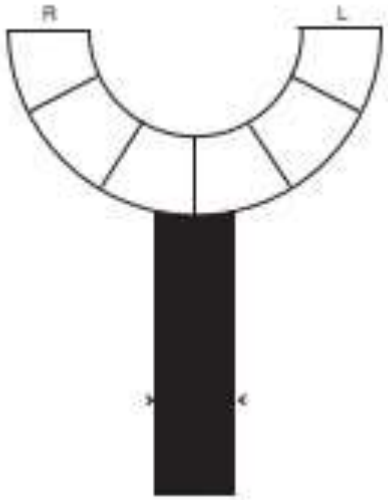
(Table.1)

The Striped-Y Classification system



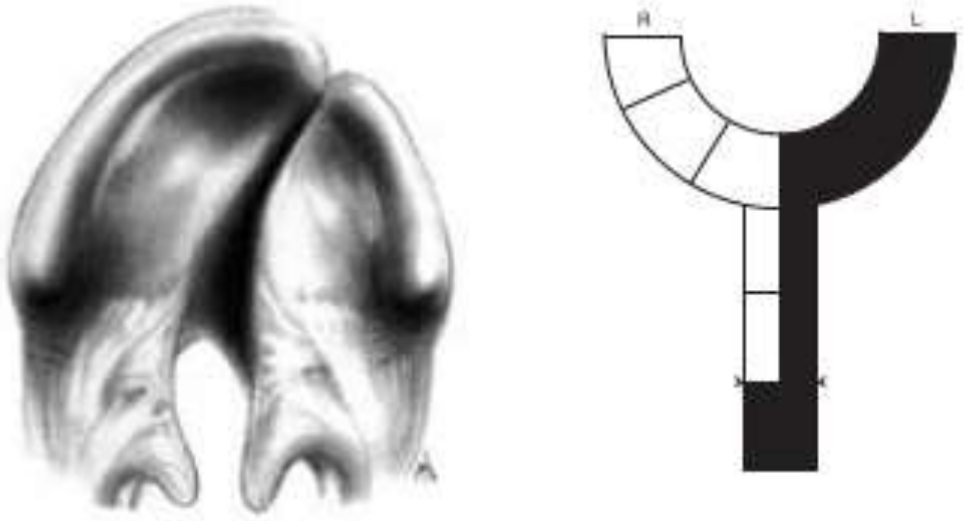
(fig.6)





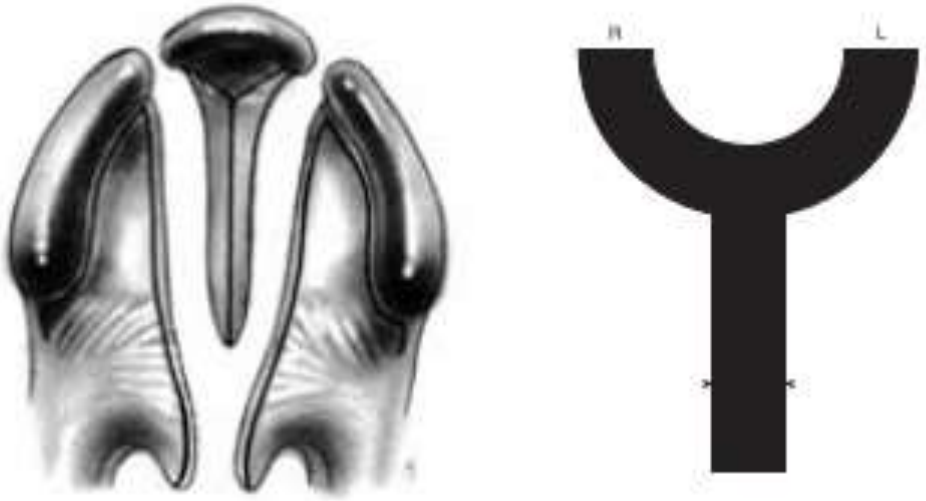
Cleft palate

(fig. 7)



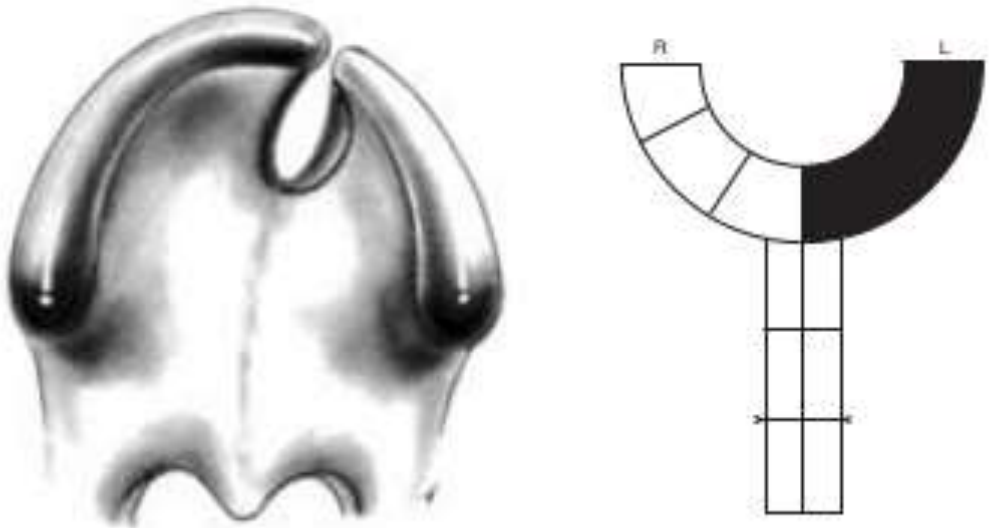
Left-sided unilateral complete cleft lip and palate

(fig.8)



Bilateral complete cleft lip and palate

(fig.9)



Bilateral-right incomplete, left complete-cleft lip and primary palate

(fig.10)

Dental Implications

- The dental implications of cleft lip and/or palate depend on the number of dental abnormalities present and the stage of treatment.
- The dentist play an important role in managing the care of the individual with a cleft lip and/or palate through education and preventive dental hygiene therapy.

Problems associated with clefts

1)Dental problems
2) Aesthetic problems
3) Hearing and speech problems
4) Psychological problems

1) **Dental problems**

- Congenitally missing teeth(mostly upper lateral incisors)
- Presence of supernumerary, neonatal and natal teeth
- Ectopically erupted tooth
- Enamel hypoplasia
- Microdontia, macrodontia
- Fused teeth
- Gemination, dilaceration

- Tendency towards class III skeletal pattern
- Posterior and anterior cross bite
- Deep bite
- Spacing/ crowding
- Protruding premaxilla

2) ***Esthetic problems***

- Facial disfigurement
- Orofacial structures can be malformed and congenitally missing
- Deformities of nose can also occur

- Numerous surgical and other medical and dental treatments are necessary to correct cleft lip/palate. The surgeries are scheduled starting at about 3 months of age & ending at about 1 year to correct simple clefts.

- Obturator is fabricated using cold cure acrylic after selective blocking of all the undesirable undercuts

- Clasp aid in retention, in case insufficient retention, wings made of thick wire can be imbedded in acrylic and made to follow cheek contour extraorally.

Surgical lip closure:

Primary closure of lip is undertaken at age of 3 months or 10 weeks when child is fit to undergo general anaesthesia.

Millard has suggested rule of 10 .

- Approximately 10 weeks of age
- 10 pounds (4.54 kg)
- Bood haemoglobin not less than 10 gram%

Two techniques have been popular:

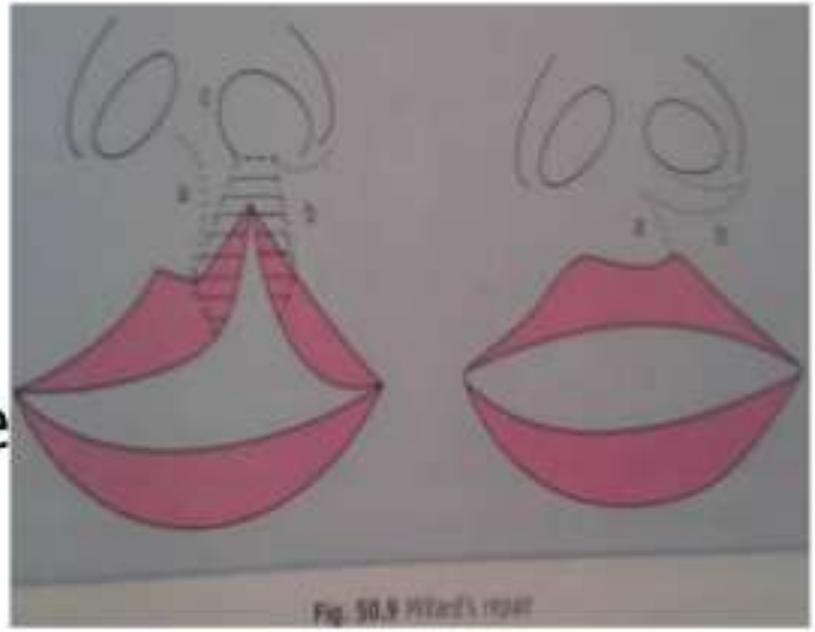
a. Tenninson's triangular flap procedure
b. Millard's rotation flap

Other technique is:

-Veau repair

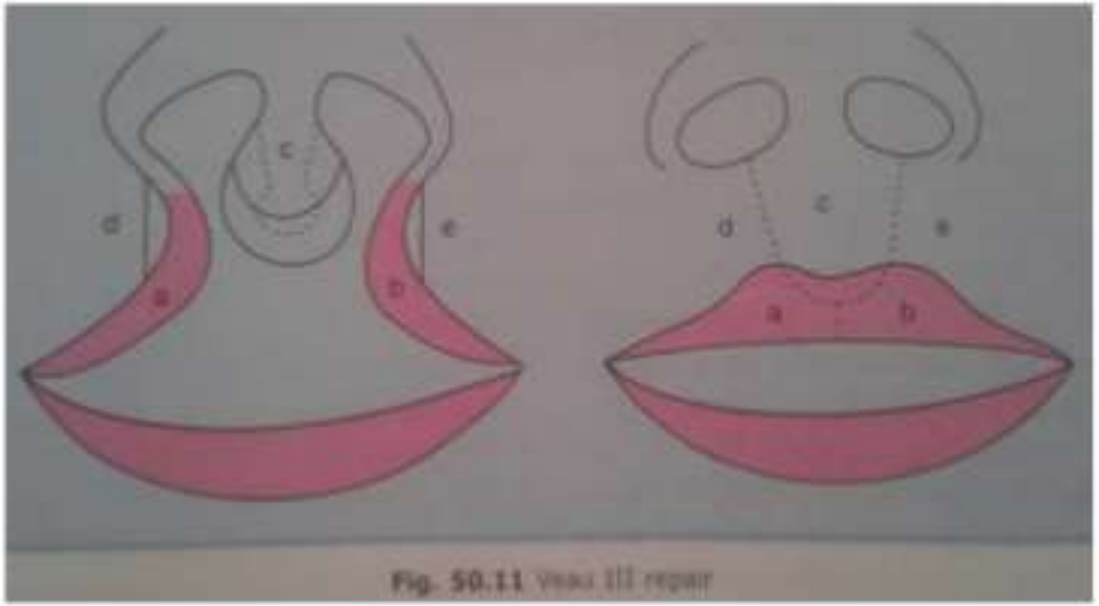
Where a=rotational flap
b=advancement flap
c=columella flap

a and c are planned on medial side of Cleft.After full thickness Of lip is cut along the marking which is filled by b planned on lateral side In this method minimal Tissue is discarded and the Result can be modified during surgery.



Millard's repair

Tennison-Randall repair



Veau repair

Post surgical complications

Cleft lip surgery

Unilateral

- Dehisence
- Infection
- Thin white roll
- tension

Bilateral

- Dehisence
- Thin white roll

Cleft palate repair

-Fistula

Velopharyngeal incompetence

-Continued VPI

-Stenotic side ports

Alveolar bone grafting

-Infected donor site

#Hematoma

-Failed grafts

#Dehisence

#Palatal prosthesis