CLEFT LIP AND PALATE.

LEUKOPLAKIA
EMBRYOLOGY

Face develops from five processes

1) One fronto nasal process at the upper central part
2) Two maxillary processes at the upper lateral part
3) Two mandibular processes at the lower lateral part

Due to the appearance of olfactory pits at 5th week one on each side of the midline at the inferior end of fronto nasal process, the fronto nasal process is divided into a central part called median nasal process (MNP) and two lateral processes called lateral nasal processes (LNP). The olfactory pits form the nostrils.
EMBRYOLOGY

Continued

- MNP develops a bulge on either side known as the globular process (GP).
- MNP and GP form the septum of the nose, philtrum of the upper lip and the premaxilla.
- LNP form the sides of the nose.
- Maxillary processes form the cheek, whole of upper lip except the philtrum and the premaxilla.
- Mandibular processes form the lower jaw.
- The central part of upper lip is thus formed from the MNP whereas the lateral part is formed from the maxillary processes. Defect in fusion of the MNP with maxillary processes will lead to the development of cleft lip.
EMBRYOLOGY

Continued

Palate develops from three components.

i) Premaxilla develops from the MNP.

ii) Palatine processes of the maxillary processes, which are two in number, fuse with each other in the midline and also with the premaxilla anteriorly to form the palate. Defects in the fusion of the palatine processes will lead to development of cleft palate.
INCIDENCE

- Incidence is roughly one in 1000 live births in Whites. Twice as common in Asians
- Cleft lip alone: 15%
- Cleft palate alone: 40%
- Cleft lip and palate: 45%
- In 75% of patients, the cleft is unilateral
- Unilateral cleft lip is more common on left side
- Risk of a child being born with cleft lip or palate is more if one parent and a sibling have CL and CP (15%)
ETIOLOGY

• Both environmental teratogens and genetic factors are implicated in the genesis of CL and CP.
• Some of them are exposure to drugs like diazepam, steroids and phenytoin (an anticonvulsant), smoking during pregnancy, alcohol and retinoic acid. More than 40% of isolated CP is associated with other congenital malformation syndromes.
1) **Pre-alveolar cleft (cleft of the lip or CL)**

(a) Unilateral  
(b) With notching of the alveolus  
(c) Bilateral

A CL is called incomplete when it does not extend up to the nostril and complete when the cleft extends to the floor of the nose. The latter is associated with flattening and widening of the nostril of the affected side and a short columella.
2) **Post-alveolar cleft (cleft of the palate or CP)**

(a) Cleft of the uvula
(b) Partial (soft palate only)
(c) Complete (soft and hard palate)
(d) Submucous cleft
CLASSIFICATION
Continued

3) **Alveolar cleft (cleft of the lip, alveolus and palate or CLP)**

- (a) Unilateral
- (b) Bilateral cleft lip and palate
PROBLEMS ASSOCIATED WITH CP

• Cosmetic
• Speech. A child with CP is unable to make the consonant sounds B, D, K, P, and T. Speech becomes nasal.
• The nose. Upper respiratory mucous membrane gets contaminated with oral organisms. Nostril is wide, ala and columella are short.
PROBLEMS ASSOCIATED WITH CP

• The teeth. The cleft interferes with the dental lamina. The upper lateral incisor may be small, absent or even duplicated, with a supernumerary lateral incisor on the canine side of the cleft. In bilateral cleft, all the incisors may be displaced. Maxilla tends to be smaller and retroposed, giving a relative mandibular prognathism.
PROBLEMS ASSOCIATED WITH CP

Continued

• Sucking and eating. Infants with CP very often have difficulty in sucking. They have to be fed with a spoon. There may be regurgitation while eating, leading to bronchopneumonia. This can be overcome temporarily by fixing a denture with special extension plate to occlude the cleft. This will also help to mold the palate prior to surgical repair.

• Hearing. Acute and chronic otitis media and hearing problems are common, sometimes even after repair. This is due to inflammatory oedema of pharyngeal mucosa and defective muscular activity interfering with efficient ventilation and drainage of the middle ear via the Eustachian tube leading to retention of inflammatory exudates and deafness.

• Airway obstruction. Some babies are prone to develop acute hypoxic attacks during sleep or when eating.
MANAGEMENT OF PRE-ALVEOLAR CLEFT

• Management of CL and CP is by a multidisciplinary team consisting of plastic surgeon, audiologist, dentist, oral surgeon, orthodontist, ENT surgeon, psychologist, geneticist, pediatrician, social worker, nutritionist and speech pathologist.
• Preliminary molding plates may have to be used in wide alveolar defects and CP.
• Surgery may have to be carried out in stages, final corrections being done after full skeletal maturity.
• Repair of unilateral cleft lip

Many procedures have been described for repair. Good result depends on proper understanding of the altered anatomy and the basic principles underlying each procedure.
**Principles of repair**

1. Excise as little as possible
2. Natural landmarks must be preserved and correctly positioned
3. The lip must be sutured in three layers, i.e. mucosa, muscle and skin, without tension
• Operations for repair of unilateral CL fall into three categories

1) Simple paring of the margins and suture (e.g. Rose operation)
2) Interposition of local triangular flaps (e.g. Tennison, Randall)
3) Rotation and advancement flaps (Millard)
• Of these, Millard’s operation is the most popular because it is simple, does not require complicated measurements. Correction is visualized as the operation proceeds.
This operation preserves the Cupid’s bow and the integrity of the philtrum and achieves unilateral lengthening of the columella.

The scar is inconspicuous as it lies along one pillar of the philtrum and along the floor of the nostril. Besides, it can be revised easily.

Millard’s procedure
MANAGEMENT OF PRE-ALVEOLAR CLEFT (Millard’s op.)

**Continued**

- **Millard’s repair for unilateral pre-alveolar cleft**
- Landmark points are marked with skin marking pen.
- Incisions are made through full thickness of the lip, i.e. mucosa, muscle and skin.
- Flaps A and B are separated from the periosteum of the maxilla on either side for a short distance and from the floor of the nostril. Flap C consists of skin only. The flaps are interposed and sutured in three layers. Flap C may be used to elongate the columella on the cleft side or to line the floor of the nostril.

![Millard’s procedure](image)
• Repair of bilateral cleft lip is essentially the same, except that the premaxilla which is projecting has to be pushed back.
MANAGEMENT OF CLEFT PALATE

- Ideal age for correction is 12 to 15 months, before the child acquires the bad habit of nasal speech. Closure of the hard palate defect can be deferred till the time of secondary dentition.
1) **LANGENBECK’S OPERATION**

In this operation, the margins of the cleft are pared, the nasal septum is defined and separated off the upper surface of the cleft palate. The mucoperiosteal flaps are lifted up from the hard palate. Two release incisions are made one on each side just medial to the alveolar margins. The mucoperiosteal flaps are mobilized till the release incisions are reached. The cleft is then repaired in the midline by bringing in the mucoperiosteal flaps and the nasal mucosa medially. Repair is done in three layers – nasal mucosa and soft palate muscles with interrupted catgut sutures and the mucoperiosteal flaps with interrupted silk.
2) **WARDILL’S OPERATION** (Four flap operation)

This operation differs from the previous one in three aspects.

i) The two flaps of the cleft palate are divided obliquely up to the releasing incisions. So, now four flaps are available. The anterior two flaps are brought to the midline and sutured. The posterior flaps are not only brought to the midline, but also pulled posteriorly to lengthen the palate. This operation lengthens the palate, so that the space between the oropharynx and the nasopharynx is diminished.

ii) Tension at the suture line is reduced further by breaking the hamulus process of the pterygoid bone on each side, thus relaxing the tensor palati muscle.

iii) Pharyngoplasty is added. This procedure is aimed at reduction of the diameter of the nasopharynx and also makes the ridge of Passavant prominent.
WARDILL’S OPERATION (Four flap operation)
SUBMUCOUS CLEFT

- Submucous cleft presents with defective speech. Examination will show a short palate, bifid uvula and a blue streak running in the midline. Transillumination through the nose will be positive as the underlying muscles are deficient. Palpation will reveal a notch in the posterior border of the hard palate. Submucous cleft with defective speech has to be corrected by surgery in the same way.

![Submucous cleft image]
**Follow up**

- Maxillary osteotomy may be required for correction of maxillary retrusion.
- Patients need regular follow up for revision surgery of residual defects, speech therapy, and orthodontic treatment.
LEUKOPLAKIA

- **Definition**: Leukoplakia is a white patch of thickening over the mucous membrane which cannot be easily rubbed off.

It is a pre malignant condition.
LEUKOPLAKIA

Continued

- The patch is rough, granular and the surface may show fissuring and hardening. Common places where leukoplakia occurs are the oral cavity, vocal cords, vulva and uterine cervix. Oral lesions are more common in older men. In the oral cavity, the lips, floor of the mouth, tongue and gums are affected. About 4% of these lesions turn malignant. Of all the lesions occurring in the oral cavity, leukoplakia of the tongue is more likely to become malignant.
LEUKOPLAKIA

Continued

• **Causes**: Excessive smoking, betel nut chewing, alcohol or any other chronic irritation can give rise to leukoplakia. Hairy leukoplakia is associated with HIV infection.
LEUKOPLAKIA

Continued

- **Histopathology:** Keratinisation of the epithelium. Changes may range from mild dysplasia to carcinoma in situ. It has to be differentiated from Candidiasis.
LEUKOPLAKIA

Continued

Management:

• Abstinence from smoking, betel chewing and alcohol, attention to oral hygiene.
• Biopsy is done first. If dysplasia or carcinoma in situ is found, the lesion is excised.
• Excision is done by scalpel, electrocautery, or laser. Cryo ablation is also used.
• Follow up of the lesion is essential as recurrence is common.