CLEFT LIP and PALATE
ANATOMY

• Cleft Lip
  – anterior to the INCISIVE FORAMEN and may also involve the alveolar process

• Cleft Palate
  – Primary cleft palate
    • failure of fusion of median and lateral palatine processes
  – Secondary cleft palate
    • failure of fusion of lateral palatine processes
ANATOMY

• Submucous cleft palate (SMCP)
  – occult cleft of the soft palate
  – classic clinical triad:
    1. bifid uvula
    2. notching of the hard palate
    3. zona pellucida – thinned area of soft palate containing only mucosa due to
  – levator veli palatini muscles INSERTING ON HARD PALATE
MUSCLES

1. Levator veli palatini
2. Tensor veli palatini
3. Palatoglossus
4. Palatofarangeus
5. Stylofarangeus
6. Superior konstrüktörler
7. Uvula
CLASSIFICATION

- Cleft Lip
CLASSIFICATION

- Cleft Palate
PREVELANCE

• Cleft lip with or without cleft palate (CL±CP)
  – Ethnicity/Sex
    • 1:1000 Caucasians
    • 1:2000 African-Americans
    • 1:500 Asian
    • 2:1 males:females

• Cleft of palate alone (CP)
  – 1:2000 (all ethnicity)
  – 1:2 males:females
**PREVELANCE**

<table>
<thead>
<tr>
<th>Affected Relatives</th>
<th>Predicted Outcomes*</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>CL±CP</em></td>
<td></td>
</tr>
<tr>
<td>One sibling</td>
<td>= 4%</td>
</tr>
<tr>
<td>One Parent</td>
<td>= 4%</td>
</tr>
<tr>
<td>Sibling and a Parent</td>
<td>= 16%</td>
</tr>
<tr>
<td><em>CP</em></td>
<td></td>
</tr>
<tr>
<td>One Sibling</td>
<td>= 2.4%</td>
</tr>
<tr>
<td>One Parent</td>
<td>= 2.4%</td>
</tr>
<tr>
<td>Sibling and a Parent</td>
<td>= 15%</td>
</tr>
</tbody>
</table>

*Note — If congenital lip pits, inherited as autosomal dominant gene with variable penetrance (Van der Woude's Syndrome) — 50% incidence*

*General predictions; individual cases may vary*
ETIOLOGY

• Multifactorial combination
  – heredity with or without environmental factors

• Teratogenic agents
  – e.g. phenytoin, alcohol

• Nutritional factors may contribute
  – folate deficiency

• Syndromic
  – 3% of CL±CP are
EMBRYOLOGY

• **Cleft lip with palate** forms at 4-6 weeks due to lack of
  – mesenchymal penetration(merging)
  – fusion

• **Isolated cleft palate** forms later at 7-12 weeks
  – lack of fusion
PATHOPHYSIOLOGY AND FUNCTIONAL DEFICITS

• Cleft lip
  – Inability to form fluid and air seal in eating or speech
  – Malocclusion as a result of intrinsic deformities of alveolar process and teeth
  – Lack of continuity of skin, muscle and mucous membrane of lip with
  – associated nasal deformity and nasal obstruction
  – Deformity
PATHOPHYSIOLOGY AND FUNCTIONAL DEFICITS

• Cleft palate
• Inability to separate nasal from oral cavity so that air and sound escape through nose in attempted speech
• Feeding impaired by loss of sucking due to inability to create intra-oral negative pressure
• Loss of liquids and soft foods through nose due to common nasal-oral chamber
• Middle ear disease and chronic otitis media due to Eustachian tube Dysfunction
PATHOPHYSIOLOGY AND FUNCTIONAL DEFICITS

• Cleft palate

• May be associated with Pierre-Robin sequence
  – cleft palate
  – micrognathia
  – glossoptosis
TEAM CONCEPT

• Because of multiple problems
  – plastic surgeon
  – orthodontist
  – dentist,
  – geneticist
  – pediatrician
  – speech therapist
  – audiologist
  – social worker
  – psychologist.
TIMING OF SURGICAL INTERVENTION

• Cleft Lip
  – Most common 10 weeks of age.

• RULE OF 10’S”
  – 10 weeks of age
  – Hgb 10
  – 10 lbs

• Range of cleft lip repair varies from
  – 0-3 months of age in full-term, otherwise healthy, infant.
TIMING OF SURGICAL INTERVENTION

• Cleft Palate
  – **Before purposeful sounds made**
  – 9-12 mos
  – Depending upon health of infant, extent of cleft
    • certainly before 18 MONTHS OF AGE if possible
TIMING OF SURGICAL INTERVENTION

• Cleft Nasal Deformity
  – Most centers perform
    • PRIMARY CORRECTION at the time of lip repair
  – Secondary rhinoplasty at
    • preschool age (4-5 years)

• Alveolar cleft
  – Most centers perform secondary bone grafting at the stage of mixed dentition
    • 9-12 years of age
    • just before eruption of the permanent canine which is often affected by the cleft
TIMING OF SURGICAL INTERVENTION

• Dentofacial skeletal abnormality
  – In most cleft patients, this manifests as
    • MAXILLARY RETRUSION/HYPOPLASIA
  – In 25% of cleft patients
    • orthognathic surgery (jaw-straightening procedure)
    • to correct a MALOCCLUSION (abnormal bite).
  – Orthognathic surgery CAN ONLY BE performed in skeletally mature individuals
    • 14-16 years of age, women
    • 17-19 years of age, men
TIMING OF SURGICAL INTERVENTION

• Dentofacial skeletal abnormality
  – With the advent of craniofacial distraction
    • surgical intervention can be performed earlier
    • both patient and parents must be advised that the growing child may
      – “outgrow” the correction
      – necessitating a repeat procedure.
• Cleft Lip

  – 3 months
  – Repair of skin, muscle and mucous membrane to restore complete continuity of lip, symmetrical length and function
  – Simultaneous repair of both sides of a bilateral cleft lip
  – Preference for primary nasal reconstruction at time of lip repair
PRINCIPLES OF REPAIR

• Cleft Lip
  – In wide clefts (>10mm)
    • presurgical orthodontics
      – palatal appliance
      – nasoalveolar molding may be indicated
    • cleft lip adhesion
      – surgery to initially bring lip segments together, followed by definitive repair of lip 3 months later
PRINCIPLES OF REPAIR

• Cleft Palate
  – 9-12 months
  – One stage repair of both hard and soft palate

• Aveolar cleft
  – 6-12 years
  – At the time of eruption of permanent canine teeth
SECONDARY REPAIR

• Cleft Lip
  – Orthognathic Lefort I osteotomy
    • for maxillary hypoplasia
    • 16 years of age
  – Secondary rhinoplasty
    • 16-18 years of age
SECONDARY REPAIR

• Cleft Palate
  – Correction of
    • VELOPHARYNGEAL INADEQUACY
    • nasal escape air due to remaining palatal defect
    • 4-6 years of age
  – Repair of any oronasal palatal fistula