The Patient with a Cleft Lip & Palate

Embryology
- Failure of normal fusion during 1st trimester
- Lip formation occurs between 4th-7th wk.
- Palate formation occurs between 8-12 wk.
- Fusion begins in pre-maxilla region & goes back toward uvula
- Cleft lip apparent by end of 2nd month/utero
- Cleft palate is evident by the 3rd month

Etiology
- Embryology
- Risk factors
  - Genetic-major factor of cleft formation
  - Cause unknown
  - Clefts associated with abnormalities in genes
- Environmental
  - Trauma to embryo, drugs-(alcohol, steroids, phenytoin, substance abuse), tobacco, infectious diseases-(rubella virus), diet-(Vitamin A, folic acid deficiency), lack of prenatal care
- Other Causes:
  - Pierre Robin Syndrome- (micrognathia) mandible too small & tongue falls backward. Respiratory obstruction main concern; may/may not have cleft lip/palate. 10-30% death rate
  - Treacher Collins Syndrome- total cranio-facial deformity

Classification of Clefts
- Basis in embryologic disturbances
- Classes based on degree of defect

Classifications of Clefts
- Class 1- Cleft of tip of uvula
- Class 2- Cleft of uvula (bifid uvula)
- Class 3- Cleft of soft palate
- Class 4- Cleft of soft & hard palates- continues through alveolar ridge on 1 side of pre-maxilla; usually associated w/cleft lip of same side
- Class 5- Cleft of soft & hard palates- continues through alveolar ridge on both sides, leaving free pre-maxilla; usually associated w/bilateral cleft lip
- Class 6- Submucous cleft in which muscle union is imperfect across soft palate. Palate is short; uvula bifid; a groove situated at midline of soft palate; & closure to pharynx is incompetent

4 Types of Cleft Lips
- Unilateral- failure of maxillary process on 1 side to fuse with medial nasal process- results in a division of lip & nasal distortion
- Bilateral- same but on both sides; both unilateral & bilateral may or may not be associated w/cleft palate; globular process & maxillary process fails
### 4 Types of Cleft Lip

- **Median**: Extremely rare; partial-complete failure of medial nasal processes to merge. Only one that can be called a "hare lip". Derived from rabbits—cleft in middle of lip.
- **Median Cleft of Mandible (occurs at midline)**: Rare condition; failure of mesenchymal masses of mandibular processes to merge together at 5th week. Dimple of chin—slightest form of incomplete merging of 2 mandibular processes.

### Oral Characteristics

- Tooth development—(disturbance in tooth bud development; increased incidence of missing/supernumerary/abnormalities)
- Malocclusion—(orthodontics usually indicated)
- Open palate—(direct access to nasal cavity)
- Muscle coordination—(hard forming sounds)
- Periodontal tissues—(maligned teeth, mouth-breathing; early periodontal disease at cleft sites)
- Dental caries—(higher risk)

### General Physical Characteristics

- Other congenital anomalies
- Facial deformities—depression of nostril on side with cleft lip, deficiency of upper lip, (may be short or retroposed), over-prominent lower lip
- Infections (respiratory & ear)
- Airway and breathing
- Speech
- Hearing loss—(higher in cleft palate patients)

### Treatment for Cleft Lip

- Early treatment
- Orthodontics & dento-facial orthopedics

May be repaired shortly after birth, "Rule of 10" (child at least 10 wks. old & weighs 10 lbs.) recommended

**Purpose**: Aids in feeding, encourages development of pre-maxilla, helps partial closure of palatal cleft, assist families in dealing with a child with cleft lip and/or palate

### Cleft Palate

- Less common than cleft lip
- Lack of growth/failure of median & lateral palatine processes/nasal septum
- Maybe due to interference w/elevation of palatal shelves

### Clefts of Primary Palate

- Failure of lateral palatine processes to fuse w/median palatine process or primary palate
- 4 maxillary incisors develop in anterior medial palatal segment
- Cuspids & molars develop in lateral palatal segment
- Associated w/missing/malformed teeth adjacent to clefts (lateral incisors & cuspids)
Clefts of Secondary Palate
- Vary from bifid uvula to complete cleft involving soft & hard palate
- Partial or complete failure of lateral palatine processes to meet, fuse, & merge with each other & nasal septum

Clefts of Both Primary & Secondary Palates
- Failure of growth/lack of fusion of 3 palatine processes w/each other & nasal septum
- Cleft of soft palate creates varying degrees of speech difficulty & swallowing problems
- Clefts of hard/soft palate-severe feeding problems; food may be aspirated in lungs

Cleft Palate
- Primary surgery should be done by 18 months or earlier
- Series of operations usually completed by two yrs. of age
- If defect lies in hard palate may wait until 5-7 yrs. of age to do surgery
- Secondary surgical procedures
- Bone grafting
  - Alveolar graft
  - Hard palate graft
  - Sources for autogenous bone
- Osseointegrated implant

Prosthodontics
- Types of appliances
  - Obturator
  - Speech aid prosthesis
- Purposes and functions

Other Treatment Modalities
- Orthodontics
- Speech therapy
- Restorative dentistry

Patient Instruction/Factors to Teach Patient
- Personal oral care procedures
  - Personal daily care
  - Fluoride
  - Rinsing instruction
  - Prostheses or speech aid
- Diet
- Smoking cessation
- Biofilm removal for cleft areas
- Maintenance of appliances
- Regularly scheduled DH maintenance
- Team treatment resources