Orthognathic Surgery

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• Orthognathic surgery involves the surgical manipulation of the elements of the facial skeleton to restore the proper anatomic, aesthetic & functional relationship in patients with dentofacial skeletal anomalies

• Greek word *orqos*, meaning to straighten, and *gnaqos*, meaning jaw
Indications

- Skeletal Class III
- Moderate to severe anterior open bite in adults
- Moderate to severe skeletal class II
- Canting
- Facial asymmetry
- Chin deformities
- Vertical maxillary excess
- Malunion of old fractures
• The basic goals of orthognathic surgery are to:
  (1) Satisfy the patients’ needs
  (2) Establish optimal function
  (3) Provide good esthetic results

• Moderate to severe occlusal discrepancies and dentofacial deformities in late adolescents and adults usually require combined orthodontic treatment and orthognathic surgery to obtain optimal & stable functional and esthetic results
• Age group for orthognathic surgery is >= 17 y for females & 18 y for males

• Dysmorphrophobia:
  - Psychological disorder where the patient has phobia of himself and can’t look into a mirror (un-acceptance of body image due to deformity)
Assessment & Planning

• History & chief complaint
• Physical examination
• Radiological assessment
• Ortho-surgical co-ordination
• Photos
• Presurgical orthodontics
• Predictive analysis
• Mock (model) surgery
• Orthognathic surgical procedure
• Postsurgical orthodontics
Presurgical Orthodontic Goals:

1) Align and position teeth over basal bone
2) Avoid excessive intrusion or extrusion of teeth
3) Decompensation*
4) Avoid unstable expansion of the dental arches
5) Perform stable and predictable postsurgical occlusion
Decompenstation
Physical Examination

I. Macro aesthetics: extraoral frontal & lateral profiles for vertical, transverse & anterio-posterior assessment

II. Mini aesthetics

III. Micro aesthetics: Intraoral examination
Macro aesthetics

Frontal Assessment
Examples
Mini aesthetics

1. Incisor display
2. Transverse smile
3. Smile symmetry
4. Crowding
5. Smile arc
6. Buccal corridor
7. Occlusal cant
8. Midlines
Incisor show at rest

Maxillary cant

Gummy smile
Micro aesthetics

1. Gingival heights
2. Emergence profiles
3. Spacing & Crowding
4. Tooth shade & shape
5. Incisor angulations & class
6. Molar class
7. Overjet & Overbite
8. Midlines
Radiological Assessment

- OPG
- Cephalogram
- +/- CT Scan
Facial Asymmetry

• Causes:

1. Congenital:  - Hemifacial microsomia
   - Cleft lip & palate

2. Developmental:  - Condylar hyperplasia

3. Acquired:  - Trauma
   - Pathology
Condylar Hyperplasia

- Condylar head overgrowth that may be active and lead to hemi mandibular elongation

- How to check activity?
  - Scintigraphy (Bone scan) using Technetium 99m Phosphate
Which side has Condylar Hyperplasia?
Mandibular Osteotomies

1. Vertical Subcondylar Osteotomy (VSO)

- **Indications:**
  - Mandibular set back (in class III)
  - Mandibular rotation (in asymmetry)

- **Approach:**
  - Intraoral (most common)
  - Extraoral
2. Inverted L & C Osteotomy:

- **Indications:**
  - Anterio-posterior movement
  - Anterior open bite & asymmetry (L only)

- **Approach:**
  - Extraoral
3. Bilateral Sagittal Split Osteotomy (BSSO):

- **Indications:**
  - Every move
    (most common procedure)

- **Approach:**
  - Intraoral
4. Mandibular Subapical Osteotomies: rare!

I. Anterior
II. Posterior
III. Total Alveolar

* A nice indication for posterior subapical osteotomy is: correction of overerupted posterior segment. How?
Genioplasty

• Correct chin deformities
• Relatively quick & simple procedure
• Intraoral approach
• Can be done under sedation or LA (if not combined with other procedures)
Maxillary Osteotomies

1. LeFort I Osteotomy:

- **Indications:**
  - All maxillary movements (set back?)

- **Approach:**
  - Intraoral
2. Segmental Osteotomies: (rare)

I. Anterior (Wassmund procedure)
- Indications:
  - Bimaxillary proclination
  - Anterior open bite
  - Maxillary protrusion (together with LeFort I)

II. Posterior (rare)
- Indications:
  - Overerupted posterior segment

III. Total

IV. Combined with LeFort I
- 2 piece osteotomy
- 3 piece osteotomy
- 4 piece osteotomy
Single Jaw Vs Double Jaw Surgery

• Combined LeFort I with BSSO is the most common procedure for patients requiring double jaw correction, called together: Bimaxillary Osteotomy (Bimax)

• Model surgery is essential for double jaw surgeries to fabricate the intermediate splint
Model Surgery
Thank You