ORThOdontics  PGI/II

COURSE ID: ODO.43
ORTHOGNATHIC SURGERY

INCLUDES:
DEFINITION, CLASSIFICATION, AND DIAGNOSIS OF THE DIFFERENT DENTO-SKELETAL DEFORMITIES
DIFFERENT TYPES OF ORTHOGNATHIC SURGERIES AND THEIR INDICATIONS FOR THE TREATMENT OF
DENTO-SKELETAL DEFORMITIES

FACULTY: Naji Abou Chebel, MD.

Goals: This series of lectures, and assistance during surgeries, should enable the resident to:
1. Identify dento-skeletal deformities that require orthognathic surgery.
2. Conduct proper clinical facial and intra-oral examination for the patients.
3. Develop a comprehensive treatment plan.
4. Orthodontically prepare a patient for an orthognathic surgery.

Objectives: The resident should be proficient in:
1. Gauging the norms of an esthetic face of today (as norms of facial esthetics tend to vary)
2. Diagnosing the various dento-skeletal deformities and the corresponding surgical treatment.
3. Establishing an ideal surgical treatment plan with other non-surgical treatment alternatives.
4. Preparing the patient orthodontically for surgery with all the necessary mechanotherapy needed (mounting impressions on articulator, preparing surgical splints...)
5. Following-up the patients after surgery with adequate management of possible post-surgical complications.

COURSE DURATION AND SCOPE: This course is scheduled between October and January for the first and second year residents. It is given every Thursday in 1.5-hour session between 5:30 p.m and 7:00 p.m and imparts fundamental knowledge needed to be familiar with different dento-skeletal deformities (DSD) and to engage it in clinical evaluation of patients.
Adjunctive to this course, individual residents are able to assist to the surgeries necessary for the treatment of the different types of DSD.

POLICY ON EXAMINATIONS: Biannual examinations (progress and final) are given for the whole course. During the course, any number of progress tests or assignments may be given. Their cumulative weight in proportion to the final grade may not exceed 50%.

ORTHOGNATHIC SURGERY

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SECTION ONE: DENTO-SKELETAL DEFORMITIES AND FACIAL ESTHETICS

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1. DEFINITION

2. CLASSIFICATION OF DENTO-SKELETAL DEFORMITIES
   A. Normal occlusion
   B. Malocclusions in the sagittal, vertical, and transverse dimensions

3. FACIAL ESTHETICS
   A. Facial balance
      a. Correct proportions
         a.1. Anterior-posterior
         a.2. Transverse
         a.3. Vertical facial height
         a.4. Symmetry
B. Soft-hard tissue interrelationship
   a. Dynamic interrelationship: the smile
      a.1. Lip line
      a.2. Buccal corridors
      a.3. Smile arc
      a.4. Symmetry
      a.5. Midline
      a.6. Occlusal frontal plane

C. Youthful appearance
   a. Tight skin
   b. Cervico-mental angle
   c. Naso labial fold
   d. Extended Ogee

SECTION TWO: INDICATIONS AND CONTRA-INDICATIONS OF ORTHOGNATHIC SURGERY

---SUMMARY OUTLINE---

INDICATIONS OF SURGERY

- CONTRAINDICATIONS OF SURGERY

- INDICATIONS OF SURGERY IN BORDERLINE CASES

---COURSE OUTLINE---

1. INDICATIONS OF SURGERY
   A. Congenital craniofacial deformities (mandible and maxilla)
   B. Severe dento skeletal deformities
   C. Technical reasons (endognathic maxilla on adults)

2. CONTRAINDICATIONS OF SURGERY
   A. Medical problems
   B. Psychological problems
   C. Radiotherapy
   D. Prior surgery

3. INDICATIONS OF SURGERY IN BORDERLINE CASES
   Depending on the patient’s chief complaint
   A. Esthetics: surgery is the first choice
   B. Functional: surgery is the last resort unless the correction of the malocclusion is beyond the envelope of dento-alveolar compensation.
SECTION THREE: DIAGNOSIS OF DENTO-SKELETAL DEFORMITIES

SUMMARY OUTLINE

CLINICAL EXAMINATION

- CEPHALOMETRIC ANALYSIS
- MODELS ANALYSIS

COURSE OUTLINE

1. CLINICAL EXAMINATION
   A. Analysis of the dento-skeletal deformities (DSD)
      a. The unbalanced face
         a.1. Extra Oral analysis of an unbalanced face
             a.1.1. Sagittal
             a.1.2. Transverse
             a.1.3. Vertical
             a.1.4. Symmetry
         a.2. Intra oral examination of DSD
             a.2.1. Sagittal
             a.2.2. Transverse
             a.2.3. Vertical
      b. The soft tissue hard tissue interrelationship
         b.1. Static
         b.2. Dynamic
             b.2.1. Lip line
             b.2.2. Buccal corridors
             b.2.3. Smile arc
             b.2.4. Symmetry
b.2.5. Midline  
b.2.6. Occlusal frontal plane  
c. Younger appearance  
  c.1. Tight skin (double jaw advancement)  
  c.2. Cervico mental distance and angle (mandibular advancement)  
  c.3. Nasolabial fold (maxillary advancement and extrusion)  
  c.4. Extended Ogee  

B. Limitations  
  a. Limitations to maxillary extrusion  
    a.1. Lip line at rest  
    a.2. Smile  
  b. Limitations to maxillary advancement  
    b.1. Naso-labial angle  
    b.2. Fronto-nasal angle  
    b.3. Tip projection  
    b.4. Alar width  
  c. Limitations to mandibular set back  
    c.1. Double chin  
    c.2. Throat/chin distance and angle  
    c.3. OSAS  

2. CEPHALOMETRIC ANALYSIS  
3. MODEL STUDY  
SECTION FOUR: HISTORY OF ORTHOGNATHIC SURGERY  

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SUMMARY OUTLINE  
STAGE  
  - FIRST  
  - SECOND STAGE  
  - THIRD STAGE  

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COURSE OUTLINE  

1. FIRST STAGE  
   A. Maxillary osteotomies to access deep tumors  
      a. Cheevers  
      b. Kocher  
      c. Lanz  
   B. Mandibular osteotomy  
      a. Hullihen  

2. SECOND STAGE  
   Treatment of prognathism by setting back the mandible
A. Condylectomy
   a. Berger
   b. Dufourmentel

B. Body osteotomy
   a. Blair
   b. Kazandjian
   c. Ginestet
   d. Dingman

C. Ramus osteotomy
   a. Lindemann
   b. Kosteka
   c. Ginestet

3. THIRD STAGE (Continuing progress)

A. Sagittal split
   a. Schuchardt
   b. Obwegezer
   c. Dalpont
   d. Hunsuck
   e. Epker

B. Vertical ramus osteotomy
   a. Moose
   b. Robinson
   c. Caldwell
   d. Letterman
   e. Hall

C. Maxillary osteotomies
   a. Lefort
      a.1. Gunther cohn stock
      a.2. Wassmund
      a.3. Auxhausen
      a.4. Schuchardt
      a.5. Obwegezer
      a.6. Bell
SECTION FIVE: TECHNIQUES OF MANDIBULAR SURGERIES

SUMMARY OUTLINE
- MANDIBULAR ANATOMY
- BIOMECHANICS
- TYPES OF MANDIBULAR OSTEOTOMIES

COURSE OUTLINE

1. MANDIBULAR ANATOMY

2. BIOMECHANICS

3. TYPES OF MANDIBULAR OSTEOTOMIES
   A. Sagittal split
      a. Technique
b. Variables (Dalpont I, Dalpont II, Dalpont III)
c. Indications
d. Advantages
e. Risks
f. Discussion of
   f.1. TMJ repositioning
   f.2. Masseter and temporalis muscle dissection
   f.3. Total or partial split
   f.4. Plates v/s screws
   f.5. Maxillo mandibular fixation
   f.6. Short term stability / Long term stability
   f.7. Timing of extraction of Wisdom teeth.

B. Vertical Ramus osteotomy
   a. Technique
   b. Variables
   c. Indications
d. Advantages
e. Disadvantages

C. Koele osteotomy
   a. Technique
   b. Variables
c. Indications
d. Advantages
e. Disadvantages

D. Genioplasty
   a. Technique
   b. Variables
   c. Indications
d. Advantages.
   e. Disadvantages

SECTION SIX: TECHNIQUES OF MAXILLARY SURGERIES

SUMMARY OUTLINE
- MAXILLARY ANATOMY
- BIOMECHANICS
- TYPES OF MAXILLARY OSTEOTOMIES

COURSE OUTLINE

1. MAXILLARY ANATOMY

2. BIOMECHANICS
3. TYPES OF MAXILLARY OSTEOTOMIES

A. Lefort I
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

B. Lefort I/2pieces
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

C. Sarpe
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

D. Lefort I/3-4pieces
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

E. High Lefort I
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

E. Segmental maxillary osteotomy (Wassmund, Shuchard)
   a. Technique
   b. Variables
   c. Indications
   d. Advantages
   e. Disadvantages

F. Lefort II
   a. Technique
b. Variables
c. Indications
d. Advantages
e. Disadvantages

G. Lefort III

a. Technique
b. Variables
c. Indications
d. Advantages
e. Disadvantages

SECTION SEVEN: CLASS II DENTO-SKELETAL DEFORMITY

SUMMARY OUTLINE
- INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES
- ORTHODONTIC PREPARATION FOR THE SURGERY
- TYPES OF CORRECTIVE SURGICAL PROCEDURES
- EXCEPTIONAL CASES
1. INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES

2. ORTHODONTIC PREPARATION FOR THE SURGERY

3. TYPES OF CORRECTIVE SURGICAL APPROACHES
   A. Maxillary set back
   B. Three-piece maxilla (extraction of 2 premolars)
   C. Mandibular advancement
      a. Bilateral Sagittal Split Osteotomy
      b. Genioplasty
   D. Autorotation of the mandible during maxillary impaction
      a. Gummy smile
      b. Open bite

4. EXCEPTIONAL CASES
   A. Cl II Deep bite
   B. Cl II low occlusal plane with protruded chin

SECTION EIGHT: CL III DENTO-SKELETAL DEFORMITY
1. INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES

2. ORTHODONTIC PREPARATION FOR THE SURGERY

3. TYPES OF CORRECTIVE SURGICAL PROCEDURES
   A. Maxillary advancement.
      a. Indications
      b. Limitations
   B. Mandibular set-back.
      a. Indications
      b. Limitations

4. EXCEPTIONAL CASES
   A. Autorotation
   B. Limitations of maxillary advancement and mandibular set-back
SECTION NINE: ASYMMETRIES

SUMMARY OUTLINE
- CLASSIFICATION
- INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES
- ORTHODONTIC PREPARATION FOR THE SURGERY
- TYPES OF CORRECTIVE SURGICAL PROCEDURES
- EXCEPTIONAL CASES

COURSE OUTLINE

1. CLASSIFICATION

A. Lateral deviation

B. Cant of the occlusal plane

C. Particular cases
   a. Hemifacial microsomnia
   b. Condylar hyperplasia

2. INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES

3. ORTHODONTIC PREPARATION FOR THE SURGERY

4. TYPES OF CORRECTIVE SURGICAL PROCEDURES

A. Mandibular surgeries
   a. BSSO
   b. Ramus elongation, shortening
   c. Reshaping the condyle
   d. Distraction osteogenesis v/s costochondral graft

B. Maxillary surgeries
   a. Intrusion
   b. Extrusion
SECTION TEN: VERTICAL SKELETAL DEFORMITIES

SUMMARY OUTLINE
- CLASSIFICATION
- INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES
- ORTHODONTIC PREPARATION FOR THE SURGERY
- TYPES OF CORRECTIVE SURGICAL PROCEDURES

COURSE OUTLINE

1. CLASSIFICATION

   A. Vertical excess
      a. Mandibular
      b. Maxillary
      c. Intermaxillary (Open Bite)

   B. Vertical deficiency
      a. Mandibular
      b. Maxillary
      c. Intermaxillary (Deep Bite)

2. INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES

3. ORTHODONTIC PREPARATION FOR THE SURGERY

4. TYPES OF CORRECTIVE SURGICAL PROCEDURES

   A. Intrusion Lefort I.
   B. Posterior intrusion Lefort I.
   C. Vertical reduction genioplasty
   D. Extrusion Lefort I (bone graft v/s biomaterials)
   E. Vertical height augmentation genioplasty (bone graft v/s biomaterials)
SECTION ELEVEN: TRANSVERSE SKELETAL DEFORMITIES: ENDOGNATHIC MAXILLA

SUMMARY OUTLINE
- INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES
- ORTHODONTIC PREPARATION FOR THE SURGERY
- TYPES OF CORRECTIVE SURGICAL PROCEDURES

COURSE OUTLINE

1. INDICATIONS OF ORTHODONTIC AND SURGICAL PROCEDURES.

2. ORTHODONTIC PREPARATION FOR THE SURGERY.

3. TYPES OF CORRECTIVE SURGICAL PROCEDURES.

   A. Surgically Assisted Palatal Expansion (SARPE)
   B. Lefort I/ 2pieces
REFERENCES