CRANIOFACIAL ANOMALIES

INCLUDES:
DEFINITION AND DESCRIPTION OF DIFFERENT CRANIOFACIAL ANOMALIES
TREATMENT MODALITIES

FACULTY: Naji Abou Chebel., MD.

Goals: This series of lectures should enable the resident to:
1. Be familiar with different types of craniofacial anomalies.
2. Diagnose the deformities, and establish a proper treatment plan.
3. Orthodontically prepare the patient for the adequate surgery.

Objectives: The resident should be familiar with:
1. The normal growth of the cranial craniofacial skeleton.
2. The anatomy of the craniofacial skeleton.
3. The pathogenesis of craniofacial anomalies.
4. The modalities of treatment for these anomalies.

The resident also should:
1. Be proficient in preparing orthodontically the patient with craniofacial anomaly.
2. Know the exact timing for referring the patient to surgery.
COURSE DURATION AND SCOPE: This course is scheduled between February and April for the first and second year residents. It is given every Thursday in a 1.5-hour session between 5:30 p.m and 7:00 p.m and imparts fundamental knowledge needed to be familiar with different craniofacial anomalies 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 craniofacial anomalies.

POLICY ON EXAMINATIONS: Final examination is 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%.

SECTION ONE: CLEFT LIP AND PALATE

INCLUDES:
DEFINITION, CLASSIFICATION, AND DESCRIPTION OF DIFFERENT TYPES OF CLEFT LIP AND PALATE
TREATMENT MODALITIES

Goals: This series of lectures, and assistance during surgeries should enable the resident to:
1. Identify and classify the different types of cleft.
2. Be familiar with the pathogenesis, the frequency in the general population, and the hereditary risk the clefted patient will pass on to his off-springs.
3. Identify the problems associated with the cleft.
5. Develop a comprehensive treatment plan.

Objectives: The resident should be proficient in:
1. Identifying the proper type of cleft lip and palate anomaly with various dento-skeletal deformities associated it.
2. Conducting the proper sequence in treatment of the cleft lip and palate patients since their birth till adulthood.
3. Establishing a proper treatment plan at any stage of the malformation with the adequate timing of surgeries to be done.
4. Preparing the patient orthodontically for surgery with all the necessary mechanotherapy needed (mounting impressions on articulator, preparing surgical splints…)
5. Following up the patient and being familiar with all possible complications.
SECTION ONE: CLEFT LIP AND PALATE

SUMMARY OUTLINE

- CLASSIFICATION
  - EMBRYOLOGY
  - EPIDEMIOLOGY
  - CLINICAL FORMS
  - TREATMENT
  - SPECIFIC ANOMALIES ASSOCIATED WITH CLEFT AND PALATE MALFORMATIONS

COURSE OUTLINE

1. CLASSIFICATION

2. EMBRYOLOGY
   A. Primary palate
   B. Secondary palate

3. EPIDEMIOLOGY
   A. Frequency
   B. Sex ratio
   C. Hereditary factors
   D. Exogenous factors
   E. Ethnic factors
   F. Associated malformations

4. CLINICAL FORMS
5. TREATMENT
   A. Technique and timing of treatment of:
      a. Cleft lip
      b. Cleft palate
      c. Cleft alveola
      d. Velopharyngeal insufficiency
      e. Lefort 1
      f. Rhinoplasty
   B. Treatment of sequelae
      a. Techniques
      b. Timing of different orthodontic and surgical treatments

6. SPECIFIC ANOMALIES ASSOCIATED WITH CLEFT LIP AND PALATE MALFORMATIONS
   A. Pierre Robin sequence
   B. Van der Wood
   C. Catch 22
   D. EEC

SECTION TWO: CRANIOSYNOSTOSIS

INCLUDES:
DEFINITION, CLASSIFICATION, AND DESCRIPTION OF DIFFERENT TYPES OF CRANIOSYNOSTOSIS
TREATMENT MODALITIES

Goals: This series of lectures should enable the resident to:
1. Identify and classify the different types of craniosynostosis.
2. Conduct clinical, facial examination of the patient
3. Develop a comprehensive treatment plan.
4. Orthodontically prepare the patient who has a craniofaciosynostosis for a maxillary osteotomy (lefort 2 or 3), or for a distraction osteogenesis.

Objectives: The resident should be familiar with:
1. The anatomy of the craniofacial skeleton
2. The normal growth of the cranial vault and skull base, and consequently the effect of premature synostosis on this craniofacial growth.
3. The pathogenesis of craniosynostosis.
4. The frequency, exogenous factors, and the associated malformations.
5. The method used to treat this pathology.
6. The preferred timing of surgical procedures.

SECTION TWO: CRANIOSYNOSTOSIS

SUMMARY OUTLINE

- DEFINITION

CRANIOFACIAL GROWTH

CLASSIFICATION

- ANATOMY

- VIRSHOW LAW
1. DEFINITION

2. ANATOMY

3. CRANIOFACIAL GROWTH
   A. Growth elements
   B. Growth engines
   C. Regulation

4. VIRSHOW LAW

5. CLASSIFICATION
   A. Trigonocephaly
   B. Brachycephaly
   C. Plagiocephaly
   D. Oxycephaly
   E. Scaphocephaly
   F. Pachycephaly
   G. Craniofaciosynostosis
      a. Apert
      b. Crouzon
      c. Pfeifer

6. CLINICAL EXAMINATION
   A. Pierre robin sequence
   B. Van der wood
   C. Catch 22
   D. EEC

7. PARACLINICAL STUDIES
   A. X-Ray
   B. 3D CT Scan

8. SURGICAL TREATMENT
A. Principle of treatment
B. Technique for each type of craniosynostosis
C. Follow-up

SECTION THREE: OTHER CRANIOFACIAL ANOMALIES

INCLUDES:
DEFINITION, CLASSIFICATION,
AND DESCRIPTION OF SOME ENCOUNTERED
CRANIOFACIAL ANOMALIES
TREATMENT MODALITIES

Goals: This series of lectures should enable the resident to:
1. Differentiate between different aforementioned malformations.
2. Understand the pathogenesis, the frequency in the general population, and the risk of hereditary transmission of the malformation.
4. Develop a comprehensive treatment plan.
5. Orthodontically prepare the patient before distraction osteogenesis or costochondral graft.

Objectives: The resident should be familiar with:
1. Tessier classification of facial clefts
2. The existent associated malformations in each syndrome.
3. The methods used to treat these pathologies.
4. The preferred timing of the different treatment procedures (surgical, orthodontic, ENT)
SECTION THREE: OTHER CRANIOFACIAL ANOMALIES

1. FACIAL CLEFTING
   A. Definition
   B. Clinical forms
   C. Treatment plan
   D. Treatment timing
   E. Technique

2. TESSIER CLASSIFICATION OF FACIAL CLEFTS

3. HEMIFACIAL MICROsomia

4. TREACHER COLLINS

5. GOLDENHAR

6. MACROSTOMIA

7. HYPERTelorism
SECTION FOUR: DISTRACTION OSTEOGENESIS OF THE CRANIOFACIAL SKELETON

INCLUDES:
DESCRIPTION OF THE TECHNIQUE
TYPES OF DISTRACTORS
INDICATIONS

Goals: This series of lectures, and assistance during surgeries should enable the resident to:
1. Know the indications and limitations of the distraction osteogenesis technique.
2. Understand the modality, the length, the consolidation, and the prognosis of the treatment.
3. Develop a comprehensive treatment plan.
4. Orthodontically prepare the patient before distraction osteogenesis (DO), and complete the treatment after it.

Objectives: The resident should:
1. Understand the principles of DO.
2. Know the different indications of DO.
3. Be familiar with the surgical technique of DO.
4. Know the sequence of treatment (Timing of different phases)
5. Be familiar with the characteristics of the different distractors available.
SECTION FOUR
DISTRACTION OSTEOGENESIS OF THE CRANIOFACIAL SKELETON

SUMMARY OUTLINE
- HISTORY
- PRINCIPLES
- INDICATIONS
- SURGICAL TECHNIQUE
- DIFFERENT TYPES OF DISTRACTORS

COURSE OUTLINE
1. HISTORY
2. PRINCIPLES
3. INDICATIONS

4. VIRSHOW LAW

5. DIFFERENT TYPES OF DISTRACTORS
   A. Mandibular
      a. Intra-oral
         a.1. Uni-directional
         a.2. Bidirectional
      b. Extra-oral:
         b.1. Bidirectional
         b.2. Three-dimensional
   B. Alveolar distraction
   C. Maxillary
      a. Internal
         a.1. Lefort I
         a.2. Lefort II
         a.3. Lefort III
      b. External
         b.1. RED device
   D. Maxillary expansion

REFERENCES
7. Lane LC. Pioneer craniectomy for relief of mental imbecility due to premature sutural closure and microcephalus. JAMA 18: 49, 1892.