

# **DENTO-MAXILLARY RADIOLOGY AND IMAGING**

## **Course 11**

### **OCCLUSAL ABNORMALITIES IMAGING DIAGNOSIS**

#### **11.1. DENTAL OCCLUSION**

##### **11.1.1. NORMAL DENTAL OCCLUSION**

##### **11.1.2. PHYSIOLOGICAL OCCLUSAL TYPES**

##### **11.1.3. OCCLUSAL ABNORMALITIES**

#### **11.2. RADIOIMAGING DIAGNOSTIC**

##### **11.2.1. RADIOGRAPHIC EXAM**

##### **11.2.2. COMPUTER TOMOGRAPHY SCAN**

#### **11.3. OCCLUSAL ABNORMALITIES TYPES**

##### **11.3.1. ABNORMALITIES IN THE SAGITAL PLANE**

##### **11.3.2. ABNORMALITIES IN THE VERTICAL PLANE**

##### **11.3.3. ABNORMALITIES IN THE TRANSVERSE PLANE**

#### **11.1. DENTAL OCCLUSION**

**Crown contact between the two dental arches when the mouth is closed knowing that:**

- dental segments of superior arch form a half of an ellipse and dental segments of inferior arch form a half of a parable,**
  - the crowns of the maxillary dental segments are a little inclined outside or vestibular and the crowns of the mandible dental segments are a little inclined inside or lingual,**
- all these being the causes why the occlusal edges or faces of the two dental arches do not fit in occlusion.**

##### **11.1.1. NORMAL DENTAL OCCLUSION**

**The regular occlusion is in psalidodontis with:**

- the superior incisors and canines occlusal edges passing before the inferior incisors and canines occlusal edges;**
- vestibular tubers of the superior premolars and molars passing outside or vestibular to the vestibular tubers of the inferior premolars and molars.**

### **11.1.2. PHYSIOLOGICAL OCCLUSAL TYPES**

**PROGENIA:** - inferior frontal teeth pass anterior to superior frontal teeth.

**LABIODONTIS:** - occlusal edges of superior frontal teeth contact occlusal edges of inferior frontal teeth - occlusal faces of superior and inferior premolars exactly overlap.

**STEGODONTIS:** - superior frontal teeth exceed far anterior inferior frontal teeth like “a pinnacle“, common in Asians.

**HISTODONTIS:** - the teeth of the two dental arches do not contact.

### **11.1.3. OCCLUSAL ABNORMALITIES**

Any deviations from the physiologically normal are generically called occlusal abnormalities, morbid entities caused by:

- congenital developmental disorders
- won disorders.

## **11.2. RADIOIMAGING DIAGNOSTIC**

Diagnostic assessment and objective evaluation of dento-maxillary abnormalities are done by:

- radiographic exam
- computer tomography scan.

### **11.2.1. RADIOGRAPHIC EXAM**

Classic radiographic exam of the skull and mandible: frontal, profile, axial, and oblique incidence define the anatomical rapports, dimensions and structural forms which are in occlusion involved.

Dental segment radiographies in retroalveolar or occlusal projections can better characterize the morphology of any implied tooth.

OPG is a dedicated dento - maxillary radiographic exam with great abilities in simultaneous both dental arches evaluation.

Frontal, profile and axial cranio-facial telerradiography are the most valuable diagnostic methods for analyze and clearly define the type of dento-maxillary abnormalities.

### **11.2.2. COMPUTER TOMOGRAPHY SCAN**

Acquisition of axial images parallel to the occlusal plane with multiplanar and 3D reconstruction possibilities it is currently the most advanced and efficient imaging method of investigation being usually indicated in diagnostic assessment and objective fine evaluation of dento-maxillary abnormalities.

### **11.3. OCCLUSAL ABNORMALITIES TYPES**

Depending on the affected segment and also the spatial development direction, dento - maxillary abnormalities are classified into:

- **ABNORMALITIES IN THE SAGITTAL PLANE**
- **ABNORMALITIES IN THE VERTICAL PLANE**
- **ABNORMALITIES IN THE TRANSVERSE PLANE**

#### **11.3.1. ABNORMALITIES IN THE SAGITTAL PLANE**

Clearly depicted by profile cranio-facial teleradiography, may be detected the following variants:

- **ANATOMICAL MANDIBLE PROGNATHISM**
- **ANATOMICAL MANDIBLE RETROGNATHISM**
- **MAXILLARY RETROGNATHISM (PSEUDOPROGNATHISM)**
- **MAXILLARY ENDOGNATION**
- **SUPERIOR PROALVEOLIA**
- **SUPERIOR RETROALVEOLIA**

#### **ANATOMICAL MANDIBLE PROGNATHISM**

It's characterized by overdevelopment of the mandible in the sagittal plane with total or frontal inversion of dental occlusion, typical for acromegaly.

#### **ANATOMICAL MANDIBLE RETROGNATHISM**

Characterized by:

- withdrawal of the menton compared with the facial massive resulting a "bird profile" look,
- with mandible hypoplasia,

- distalised occlusion,  
is typical for pituitary dwarfism and Turner syndrome.

### **MAXILLARY RETROGNATHISM (PSEUDOPROGNATHISM)**

It's characterized by clogging of superior maxillary due to a sagittal growth disorder.

### **MAXILLARY ENDOGNATION**

Due to regional compression, it's characterized by:

- maxillary narrowing with resulting dental arch in "V " or U-shaped,
- with prominent frontal teeth,
- ogive palatine vault,
- distalised occlusion.

### **SUPERIOR PROALVEOLIA**

It's characterized by:

- narrowing of the superior dental arch at the canines or premolars levels,
- gothic arch palatine vault,
- distalised occlusion with sagittal inoclusion.

### **SUPERIOR RETROALVEOLIA**

Appear with the apical alveolar arch smaller than the crown one, mesialized and total or frontal inversion occlusion.

## **11.3.2. ABNORMALITIES IN THE VERTICAL PLANE**

There were described and classified as:

- **OPEN OCCLUSION**
- **ANTERIOR INFRAGNATION**
- **MAXILLARY INFRAGNATION**
- **SUPERIOR INFRAALVEOLIA**
- **SUPERIOR SUPRAALVEOLIA**

## **OPEN OCCLUSION**

Appear by an overdevelopment of the facial lower floor, with:

- open oral slit,
- prominent menton,
- an inoclusion in frontal plane which may be only in the frontal region or in the lateral one.

## **ANTERIOR INFRAGNATION**

Represent an open frontal occlusion.

## **MAXILLARY INFRAGNATION**

Appear in association with endognation and retrognation.

## **SUPERIOR INFRAALVEOLIA**

It's characterized by:

- an open occlusion
- with frontal superior arch elevation which describes a down convex curve.

## **SUPERIOR SUPRAALVEOLIA**

Or deep occlusion is characterized by:

- decreased facial lower floor,
- deep occlusion,
- distalisated rapports.

### **11.3.3. ABNORMALITIES IN THE TRANSVERSE PLANE**

Are delineated as:

- MANDIBULAR LATEROGNATION BY OVERDEVELOPMENT
- MANDIBULAR LATEROGNATION BY UNDERDEVELOPMENT

## **MANDIBULAR LATEROGNATION BY OVERDEVELOPMENT**

It is a mandibular asymmetry in relation with the medio-sagittal plane characterized by overdevelopment of one half of mandible, with:

- lingual deviation of molars and premolars in the affected side,
- vestibular deviation of molars and premolars in the normal side.

## **MANDIBULAR LATEROGNATION BY UNDERDEVELOPMENT**

**It is a mandibular asymmetry in relation with the medio-sagittal plane characterized by underdevelopment of one half of mandible with:**

- vestibular deviation of molars and premolars in the affected side,**
- lingual deviation of molars and premolars in the normal side.**