**Lec.7 Maxillomandibular Relation dr.makarem**

**Horizontal jaw relation**: it is the relation of mandible to the maxilla in a horizontal plane. Horizontal relations establish the front-to- back & side to side relationships of one jaw to the other.

**The horizontal relations include:**

**1-**Centric jaw relation.

**2-**Eccentric jaw relation. **a-**protruded or forward relation. **b-**left or right lateral relation.

**Centric jaw relation**: the most retruded relation of the mandible to the maxillae when the condyles are in the most posterior unstrained position in the glenoid fossa from which lateral movement can be made at any given degree of jaw separation. It is a bone to bone relation.

**Centric occlusion:** it is the occlusion of the opposing teeth when the mandible is in centric relation this may or may not coincide with maximum intercuspation.

The most common concept in construction of complete denture is to have the maximum intercuspation position coinciding with centric relation.

**Purpose of recording centric jaw relation:**

1-It is a reference position from which the mandible can move to any eccentric position &return back involuntary.

2-It is learnable, repeatable, &recordable position, can transferred to the articulator.

3- Functional movement like chewing &swallowing are performed in this position, because it is the most unstrained position.

4-It is a reliable jaw relation, because it is bone to bone relation.

**Factors influencing centric relation record**:

1-Resiliency of the tissues supporting the denture bases.

2-Stability & retention of the record bases.

3-TheTMJ & its neuromuscular mechanism.

4-residual alveolar arch

5- The skill of the dentist.

6-the posture of the patient

7- the health and cooperation of the patient

8- pressure applied in making the recording

9-saliva

10- tongue

**Methods of recording centric jaw relation:**

1-Tactile or inter occlusal check record method.

2-Functional (chew in) methods.

3-Graphic method.

**1-Tactile or inter occlusal check record method**:

The tactile or inter occlusal check record method is referred to as a physiologic method.

The normal functioning of the patients proprioception and tactile sense is essential in the making of an accurate record.

in inter occlusal method the centric relation is recorded by placing a recording medium between the record bases when the jaws positioned at centric relation.

Materials that are commonly used for inter occlusal records include:

* impression plaster,
* wax,
* zinc oxide eugenol paste ,
* silicon &polyether.

The patient closes into the recording medium with the lower jaw in its most retruded position & stops the closure at predetermined vertical relation. This method is simple because mechanical devices are not used in the patient mouth & are not attached to the occlusion rims. This method has the advantage of causing minimal displacement of the recording bases in relation to the supporting bone.

Registering centric relation:

* place three separated lines between the rims in the centric relation (midline and canine eminences)
* two sharp (V) shaped notches in the molar/premolar area of each sided wax depth 1-2 mm
* ensure adequate notch depth
* apply thin layer of recording medium
* instruct the patient to close in centric relation position
* check the record
* registration should be sharp and not rounded
* seal the upper and lower bite rims
* be sure that the midline and canine lines of the upper and lower arch coincide
* No contact at the heal

**2-Functional methods:**

The patient produces a pattern of mandibular movements by moving the mandible to protrusion , retrusion , and right and left lateral, examples of this technique are:

**a-Needle-house technique:** the needle-house method uses occlusion rims made of impression compound with four metal styli placed in the maxillary rim. When the mandible moves with the styli contacting the mandiblular rim &cut four diamonds-shaped tracings. The posterior most point of this diamond pattern indicates the centric jaw relation.

**b-Patterson technique:** the Patterson method uses wax occlusion rims. A trench((نفق is made in the mandibular rim & a mixture of half plaster &half pumice is placed in the trench. The mandibular movement generates compensating curves in the plaster & pumice. When the plaster instructed to retrude the mandible & the occlusion rims are joined together. The disadvantages of needle-house &Patterson techniques involve lateral &anteroposterior displacement of the recording bases in relation to the supporting bone while the record is being made.

**c-Swallowing technique:** in this method, soft cones of wax are placed on the lower record base. The wax cones contact the upper occlusion rim when the patient swallows. This procedure is supposed to establish both proper vertical & horizontal relation of mandible to maxilla.

**3-Grafic methods:**

* the graphic methods record a tracing of mandibular movement in one plane ( horizontal plane).These movements in the horizontal plane describe a figure known as the gothic arch tracing, also known as arrow point tracing.
* Pantograph: it is graphic record of mandibular movements in three planes.
* Graphic methods are either intra oral or extra oral depending upon the placement of the recording device. The extra oral is preferable to the intra oral tracing, because the extra oral is more accurate, more visible & larger in comparing with intra oral tracing.

**Methods for assisting the patient to retrude the mandible to centric jaw relation:**

1-Instruct the patient by saying "let your jaw relax,pull it back, &close slowly &easily on your back teeth".

2-Instruct the patient to contact with his tongue a piece of wax placed on the posterior palatal seal area &slowly close.

3-The patient is asked to try to bring his upper jaw forward while occluding on the posterior teeth.

4-The head is tilted back, so that the resulting tension of muscles under the chin makes protrusion more difficult.

5-The patient is asked to swallow & close slowly.

6-Instruct the patient to protrude and retrude the mandible repeatedly.

**Eccentric jaw relations:** any relationship between the jaws other than centric relation.

**Lateral jaw relations:** the relation of the mandible to the maxilla when the lower jaw in a position to either side of centric relation.

**Protrusive jaw relation:** the relation of the mandible to the maxilla when the mandible is thrust forward,

**Methods of recording eccentric jaw relation:**

 The main reason in making an eccentric jaw relation is to adjust the articulator to simulate the eccentric movement(lateral& protrusive) of the mandible to maxilla, & to establish balanced occlusion. The records are made in the same manner as for centric relation record & these include the functional, graphic &inter occlusal eccentric record for protrusive, left & right lateral movement. inter occlusal eccentric records may be made on the occlusion rim before the teeth are set up or on the posterior teeth at the try in appointment. When this record is made on Hanau articulator, the following formula is used to obtain an acceptable lateral inclination:

**L=H/8+12**

**L=lateral condylar inclination in degrees.**

**H=horizontal condylar inclination in degrees as established by the protrusive relation record.**

