

***Title of Lecture: biomechanics of the cranio-mandibular complex .***

***Date of Lecture: 20/10/2014***

***Sheet no: 5***

***Refer to slide no. : 5***

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Slide (1) :



(3)

(2)

(1)

* Sagittal section of TMJ :

1. Temporal bone .
2. Articulator disk.
3. mandibular condyle .

* Superior compartment 🡪 between the articular eminence (temporal bone) and the superior part of the disk.
* Inferior compartment 🡪 Extends down the posterior aspect of the condyle .

Slide (2) :

* Lateral gliding movements ( to the right and left ) .
* Mandibular bone is the only bone in the human body that is attached from the right and left side , so If you move one side automatically the other one will be moved .

Slide (4) :

When we start opening our mouth the first part of opening ( up to 20 mm ) 🡪rotational movement but without translation ( no positional change of the condyles ) .

Slide (6) :



In saggital section one condyle is rotating and the other condyle is affected by the movement of the first one.



**transverse horizontal axis** (terminal hinge axis ) , in the posterior part of the inferior compartment .



frontal section .

Slide ( 7) :

Rarely occurs during normal function ( when we talk or eat we move our mouth in lateral movement and we open our mouth more than that ) .

Slide(11) :

Vertical dimension at rest > vertical dimension at occlusion .

Free way space = Vertical dimension at rest - vertical dimension at occlusion ( avg 2-4 mm ) .

Why it is important to know the measurement of FWS ?

Because I am dealing with an edentulous patient.

one of the steps of making complete denture is bite registration which is made according to the measurements of the wax rim ( 22 mm for the maxilla , 18 mm for the mandible ) , so if you do your wax rim with these measurements you will get a free way space with 2-4 mm .

If we don’t have a free way space, we will not be able to talk.

Slide (12) :

1. Body & head posture.
2. Sleep ( much more relaxed 🡪 FWS ) .
3. Psychic factors influencing muscle tonus ( if u are stressed 🡪 FWS ).
4. Age ( with age muscles became more relaxed 🡪 FWS ).
5. Pain, muscle spasm ( FWS ) .
6. Systemic factors: Parkinson’s disease, tetanus, etc.

* Generally , FWS= 2-4 mm , but when I am dealing with an edentulous patient ( 80 years old ) and his FWS = 15 mm , it doesn’t make sense to get it back to 2 mm so we make the denture with 6-7 mm .

(13) :

Centric Relation (CR):

1. The maxillomandibular relation in.
2. The condyles articulate in the anterior-superior position.
3. It is restricted to a purely rotary movement about the transverse horizontal axis.

Slide(19) :



rotational movement (20 mm between the upper and lower central incisor )

One single arch

Translation ( forward , downward )

* Posterior border movement 🡪 2 sections.
* Anterior border movement 🡪 1 single arch.

Because of rotation and translation movement in the posterior border.

* Superior contact border ( contact of the teeth with each other ) between the maxilla and the mandible .

Slide(31) :

Inter cuspal position .



Rest position 🡪 at rest our teeth are separated 2-4 mm .

Slide (33) :

When you move ur mandible to the left 🡪 the right TMJ will move downward, forward and medially and in this case the right TMJ is non- working condyle , whereas the left one is working condyle .

So we have non- working, orbiting, or balancing condyle and we have working , or rotating condyle .

* In horizontal section we get a rhomboid shape from the border movement .

Slide (36) :

Ps . Bennett Angele and Bennett movement they don’t happen on the same side :

Bennett angel 🡪 on the non- working condyle .

Bennett movement 🡪 on the working condyle .

Bennett angel and Bennett movement are important , in order to make the occlusion of the patient’s complete denture with accurate measurement .