Sheet no. 3 - 16/2/2015

Refer to slide : #3 “ Articulators “ – Doctor : Ala’a

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Our lecture is going to talk about **Articulators** .. definition , uses , components , types and Indications ^\_^



* First thing we should start with is to know **what’s an articulator**?

mechanical device used to simulate **mandibular** movements.

The principle employed is the mechanical replication

of the paths of movement of the posterior and the anterior

 determinants.

Jaw can perform many movements ; Protrusive , retrusive and lateral movements .. they are under the control of the condyles , and our goal from articulators is to be able to know how exactly these movements are done in the patient after we take his impression . So , we take an impression , send the patient home , make a cast , mount it and then hold it on the articulator ... It will be my reference & ill be able to check his occlusion very easy and to form an idea about the border movement ..

* The term **BORDER MOVEMENT** is The outer limits of all excursive movements of the mandible “ all the movements the mandible can do are called border movements , and they are **highly reproducible** and useful for articulator adjustments “

 “ then the doctor said that all the movements the mandible can perform will not change because they depend on the patient’s own condyles unless there is a disease “

* **Why do we need an articulator ?**

1) **faithful simulation** : casts on the articulator exhibit the same tooth to

tooth and arch to arch relation that exists in the patients mouth “ to find out how the teeth occlude on each other “

 2) Movements of the mandible are simulated on the articulator **as close**

 **as possible to what exists clinically** .. and this depends on the type of articulator , the more developed the articulator is the more its better ..

* **How can we use an articulator to simulate the clinical situation ?**

 We have something called a hinge axis

 Which is a line that passes through the

 right and the left condyles, determining

 it is essential in constructing dental

 prosthesis and correcting occlusal

 interference “

**We need to mount the maxillary cast on the articulator in relation to the terminal hinge axis ..**

* **How to use the articulator ?! by these three steps ;**

1) **Mounting the upper cast : Facebow** “ a device used in dentistry to record the positional relations of the maxillary arch to the temporomandibular joints “

 2) **Mounting the lower cast : interocclusal** records “an imprint of the

 positional relation of opposing teeth or jaws to each other, made of the surfaces

 of occlusal rims or teeth with a material such as plaster of paris “

3) **Programing the articulator**

“ the doctor only mentioned the steps , she said facebow & interocclusal records will be taken next lecture, I used google to define them “

* **Aim of using Articulators :**

Fabrication of prosthesis “ indirect restorations “ that are in harmony with the existing occlusal scheme and TMJ situation ..

* **Articulators advantages :**
1. **permits the visualization of the teeth from all aspects at different mandibular position.**

 in the patient its hard to see all the aspects of the teeth and how

 they occlude on each other , but on an articulator it will be much easier as

 it provides us with a full view from different directions by simply changing

 the way we are looking towards it whether from the back or the front etc ..

1. **Study of sectors of the dental arches .**

For example if I want to work on anterior teeth ; I can eliminate the posterior ones so I provide myself with a better view for the anterior ones and make it much easier for me to work with .

* **Uses of Articulators :**
1. **PreTreatment stage ;**

# Occlusal analysis and equilibration ; analysis by putting an articulator paper on the cast instead of the patient’s mouth to check if the patient has high contact or anything else .. equilibration is to get rid of the pressure area on the cast by removing parts of enamel , so its better to apply our plans on the articulator instead of his mouth .

#Changing the arch and tooth relationship preparing for orthognathic

Procedures ; its always more safe to try our treatment plan on the articulator first.

# Wax up for diagnosis and proper planning, as well as communicating and

explaining the treatment to patients ; to show the patient what I am planning for and to put him in the picture.

1. **Treatment stage ;**

# Fabrication of fixed and removable prosthesis that are in harmony with

the existing occlusion .

# Fabrication of splints for occlusal therapy .

**-**occlusal splints : keep the orientation of the teeth at the same position ..

* **Components of Articulator :**

 - Superior and inferior member

 - Vertical arms

 - Mechanical fossae and condyle

 - Incisal pin and table “ for determination of maximum intercuspation “

* **Classification of articulators :**

1) **Arcon** : **Ar**ticulating **Con**dyle.

- Fixed Prosthodontics.

- The **condylar elements are placed on the lower member** of the articulator, just as the condyles are located on the mandible. The **mechanical fossae are placed on the upper member**, simulating the position of the glenoid fossae in the skull .

**2 ) Non arcon :**

In non arcon ,the case is the opposite (the fossa is located in the lower member of the articulator while the condyle is located in the upper, the opposite of the anatomy). **The arcon one is used for fixed prosthesis & the non-arcon is used for removable prosthesis.**

* **Programing an articulator :**

Anterior guidance & posterior guidance

-Anterior determinant is the anterior guidance (over jet &over bite) & the -posterior determinant is the posterior guidance ( Bennett angle ,lateral side shift & condylar guidance)

* In the posterior the variations of glenoid's fossa location is what determine the movement of the mandible
* Bennett angle: an angle created during lateral movement by sagital plane & the path of advancing condyle as viewed in horizontal section.
* Non working condyle will exhibit a translocation (Bennett angle) , while the working condyle or the lateral side shift will exhibit lateral rotation (Bennett movement)
* **Types of articulators:**

1-**hinge articulator** : its not adjustable – it could only make hinge movement; opening & closing – maximum inter cuspation .

**uses**: single tooth restoration when the occlusal influence is minimal .

**the problem** : Inaccurate ؛Dimensions of the articulator (distance between the transverse hinge axis and the teeth, in the articulator here the axis is very close to the teeth .

**Does not reproduce any type of movement except hinge**

Only position is maximum intercuspation

2- **average articulator** ( the one that we use) : Condylar inclination fixed between 20 and 30 °- mounting of cast is established using an occlusal table - cannot be programmed cuz its not adjustable

**Used for** : complete denture fabrication

3-**Semi adjustable Articulator** : More accurate reproduction of mandibular movements - Intercondylar distance can be modified(the distance between the 2 condyles).

1st generation: Reproduce the condylar inclination, Bennett angle ..

2nd and 3rd generation: includes the immediate side shift ..

Some have straight condylar paths , others have curved paths (path of movement is not a straight line naturally , so condyles with curved path are more accurate)

Progressive side shift … bennets movement

Immediate side shift … the rotation that happens

4-**Fully adjustable Articulator** :

Reproduces the entire mandibular movement border movement

(inclination and path)

Intercondylar distance is completely adjustable

simulate the mandibular movements in 4 dimension

Requires a pantographic recording

Kinematic facebow registration (we will talk about this next lecture)

Highly expensive and time consuming

**\* Indications:**

-Non Adjustable Articulators ;

(Hinge and average angle articulators)

Single Tooth restoration

-Semi adjustable Articulators ;

Mostof ﬁxed and removable dentures

-Fully adjustable Articulators ;

Complex Multiple tooth restorations

Missing anterior guidance

Extensive occlusal modiﬁcation

Changes vertical dimension of occlusion

Atypical mandibular movements

TMJ problems

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**p.s : Never Lose Hope ♥**