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Prosthodontics III

* Sheet

Slide

Hand Out

Designed by: Hind Alabbadi

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**Occlusion**

* **Occlusion** : simply means contact between teeth.
* **Static Occlusion** : describes contact between teeth when the mandible is closed ( in static )

there is no mandibular movement during contact between teeth.

* When we start asking the patient to move his teeth to the right or left side , forward or backward this is **dynamic occlusion**.

In dynamic occlusion there is mandibular movement during contact between teeth.

***To sum up :***

**Static Occlusion :** contact between occlusal surface of upper and lower teeth with no movement.

**Dynamic Occlusion** : contact between occlusal surface of upper and lower teeth with or during movement.

**Articulation** means dynamic occlusion by default.

We studied that the electrical current move from – to + but they found that the current actually move from + to – , bs E9tela7ian 7aloha eno the current move from – to + .

And the same here, E9tela7ian when we say occlusion usually we mean **static occlusion**

Static occlusion = centric occlusion

* **Terminology**
* **Centric Relation (CR) :** Retruded Contact Position (RCP) , relation between 2 different **bones**

It has nothing to do with occlusion ( teeth) // hoon b9edona fe al as2ela

Its bone to bone relation (between the mandible and the base of the skull).

When someone in viva exam ask you to define CR you have to mention 3 things what they are? Don’t answer RCP its wrong definition

CR defined in 3 axises:

1. Anatomical : means the relation between the condyle of the mandible and the glenoid fossa in the base of the skull.

If we suppose that the glenoid fossa divided into 3 parts : posterior , middle , anterior and in another section divided into 2 parts : superior and inferior ….. so the highest point is the anterior superior

So in CR the condyle is in the most anterior superior position of the condyle glenoid fossa

Zaman kano ye7ko lma tkoon el condyle 2b3ad ma yomken but this is a wrong definition

1. when The mandible in relation to the base of the skull and the muscles are relaxed (there is minimum tension but it is the most relaxed position of the mandible)

lma tkoon wa2ef bkoon fe minimum tension 7ta ma tw8a3 in the the same time you didn’t do any effort

Without this minimal tension we will end up with mandible rest on chest !!!

1. Geometric : only rotation of the condyle around hinge axis (imaginary line btween the 2 condyles) during movement

* **Centric Occlusion (CO) :** Inter Cuspal Position ( ICP) , relation between **teeth**

it is the most habitual position

every time you ask the patient to bite you will see this bite cuze it is a habitual bite.

It is not necessary to be ideal or perfect (In some cases there is a cross bite or interferences ) or in Centric Relation (CR)

in **10%** of population the CR coincident with CO ; when the pt bite his teeth in CO and the mandible in CR

you have to listen carefully to your patient to know if he complains from impaired aesthetic or function.

**Posselt’s envelop of occlusion**

When the condyle in CR it will rotate up to a limit (20 mm = 2cm)

producing this line 

after that limit (20 mm) translation will take place so the condyle will be no longer in CR.

So when you see this line you will know that the starting point of the movement is the CR.

\*\* why it is important to have good adequate record for CR?

Because it is 1- reproducible 2- reference for making a new occlusion when the pt has multiple missing teeth or no teeth at all.

Now we will talk about new concept

**Long centric occlusion or freedom in centric**

It means that the patient can move his mandible anterio-posterior and medio-lateral (in all directions) and the teeth are still in centric occlusion (maximum intercuspation) , the teeth are not locked to each other

Of course the mandible can move while the teeth are still in contact up to a limit( 0.5- 1.5 mm)

This concept is important in immediate dentures; as we know we insert the denture immediately after extraction and after a period of time the denture become unstable due to bone resorption .

so if we have locked occlusion (narrow cusp and narrow fossa)the patient will not be able to bite after a period of time cuze his occlusion become disrupted and further sittling of the denture take place after extraction and resorption

We solve this problem by using teeth with wide shallow fossa and narrow (tipped or tapered) cusp tip which means unlocked occlusion (freedom in centric)

Freedom in occlusion considered as a variation , also it is a fame I’m looking for when we plan the occlusion of complete or immediate dentures.

Figure 6 page 5 in article:

1. No freedom in CO (locked occlusion)

-Posterior teeth: we can see narrow cusp locked in narrow deep fossa so when the movement start the border of the cusp will touch the border of the fossa ; there is no space so to move the mandible we have to separate the teeth

- anterior teeth : the lower incisal edge in contact with the palatal surface of upper incisor so there is noway to move the mandible forward unless you separate (disocclude)the teeth from each other.

(b) freedom in CO ( unlocked occlusion)

-Posterior teeth: we can see that the cusp is narrow enough(tipped or tapered) and occludes wide shallow fossa , so there is a space for movement and there is noway for locking … so you can move the mandible 0.5-1,5 mm and keeping the teeth in their occlusion at the same time.

(7araket mosmar 3la table as.hal mn m5roo6 3la m5roo6)

- anterior teeth : there is a space betwwen lower incisal edge and upper palatal surface that allow the movement without disocclusion of the teeth.

* **Important terms in dynamic occlusion :**
* **Guidance** : control or guiding the movement of the mandible , its as simple as that.
* **Working side** : the side that you move the mandible toward

Eg: if you work food at right side, then the working side is the right side and the working condyle is the right one. , the othe side (left) is the **non-working side**

Less movement of the condyle(**working condyle**) at the working side ; rotational movement and sometimes it shifts laterally (side shift)

If the working condyle shifted laterally immediately when the patient starts movement this known as **immediate side shift** .

* The non-working (balancing or **orbiting**) condyle move downward, forward and medially.

What determine the borders of mandibular movement?

* Teeth - TMJ - Muscels
* **Posterior guidance:**

We are not talking about posterior teeth // hoon b9edona fe al as2ela

It is controlled by the most post component of the masticatory system which is the TMJ , it contains condyles , glenoid fossa and soft tissue the most important one is the codyles

So , What is controlling the posterior guidance ? TMJ or condyle

**We have 2 major angles:**

\***Anterior-posterior condylar guidance angle ( condylar angle**)

When the condyle move downward forward it will draw a line that is known as condylar path

The angle between the condylar path and horizontal plane

It ranges between 30-45 Usually it is average =33 ( imp Q in bite registration competency)

We see it from front or side

**\*Medio-lateral condylar guidance angle ( bennet angle)** // benet msh wlad

From sagittal view (to9’rob wa7ad 3la no9 raso mn 8odam) , it is the angle bet the direction of movement of the condyle (downward, forward and medially) and vertical plane.

We see it from front or above

\*\*Usually we measure it on the non-working side cause it is easier but also we can measure it on the working side ; as we said the working condyle rotates vertically (this is the vertical plane) and shifts laterally the angle between them is bennet angle.

It ranges between 16-22 and Usually it is 18

* **Anterior guidance** : guiding the mandible using teeth ( both anterior and posterior teeth) ; the most anterior part of the masticatory system.

Divided into 3 parts:

1. **Incisal guidance (anterior teeth guidance)** : guiding the mandible during protrusive movement and sometimes during lateral movement using anterior teeth( incisors and in some cases incisors and canines ; cuze the incisors have incisal edge and the canines have incisal tip) are in contact only , the forces will act on these teeth .

// In natural dentition when we protrude the mandible , only the anterior teeth will be in contact and the posterior teeth will be separated this is known as” **Christenson’s Phenomena**” which is contraindicated in complete denture cuze if it presents in complete denture the denture will flip from the back during protrusive movement.

1. **Canine guidance** : only canines are in contact during lateral movements and the remaining teeth are out of occlusion
2. **Group function guidance** : group of teeth ( premolars and 1or 2 molars with or without canines) are in contact and the remaining teeth are out of occlusion.

It is not necessary to have contact on all molars or premolars.

This is called Normal occlusion

Ideal occlusion is very rare , we can achieve it using artificial restorations.

**Ideal occlusion ≠ Normal occlusion**

* **Occlusal Interferences**: means anything that interfere with the guidance of the mandible .

Types:

* **Premature contact or interference in centric occlusion** ( eg: high class 1 amalgam filling , when the pt bite the contact will be only on this tooth and the remaining teeth seperated )
* Lateral interferences , its either working side interference or non-working side interference.
* **working side interference** ; anything that prevent teeth contact on the working side

eg: if you are eating on the right side (working side) and there is a contact on the 7’s only

* **non-working side interference** ; any thing that touch the left side while you are eating (working) on the right side
* protrusive interferences : any contact or touch between posterior teeth when you move the mandible forward.

**\*\* What are the differences between Natural and Artificial teeth?**

|  |  |
| --- | --- |
| Natural teeth (occlusion) | Artificial teeth (occlusion) |
| Teeth move independently | Teeth move as one unit |
| There is proprioception (can feel force of occlusion,chewing,taste) | \_\_\_\_\_\_\_\_\_\_ |
| High magnitude of force | Less magnitude |
| High number of functional muscle | Less number of functional muscle |
| Second molar is the center of occlusion (mastication) | Second molar should be out of occlusion |

In complete denture , the first molars set on almost straight surface (ridge) so the force will pass along the long axis of them vertically (no horizontal component of the force)

While the second molars set on the retromolar area (slope) so the acting force have 2 components ,vertical and horizontal which cuze sliding of the denture forward along the slope (arch of movement)

So during setting of teeth of complete denture try to make the articulation on 6’s and 5’s more than 7’s to prevent sliding of the denture during movement.

* **Mutually Protected Occlusion**

Means that in Natural Dentition during Protrusive movement the anterior teeth are in contact and the posterior teeth are seperated , so the anteriors protect the posteriors

in Centric Occlusion (CO) the posterior teethare in contact and the anteriors are separated , so the posteriors protect the anteriors

* Explanation
* **In CO** :

// the posterior teeth are in contact (maximum intercuspation), they send signals to the brain to increase the forces of occlusion ( lma tkoon takol w yeje 7ajar 3la your tooth it may fracture due to high force magnitude)

// closing reflexand increase in the magnitude of the force

// all muscles are in function

// the acting forces are vertical ,and the Anterior teeth are inclined , so if there is any contact between ant teeth in CO we will endup with bone destruction and periodontal diseases

so the straight (not inclined) posterior teeth contact in CO protect the inclined anterior teeth

* **In Protrusive Movement**:

// there is contact between anterior teeth and the posterior teeth are out of occlusion

// opening reflex ( if you bite your lip during eating you will open your mouth immediately as a reflex) so we protect the tissue and decrease the magnitude of the force

// less number of functional muscle compared to the number of functional muscle in CO

// the acting forces are oblique , and the posterior teeth almost are straight (not inclined) so if there is any posterior contact during protrusion this will damage the posterior teeth and cause periodontal disease.

* Occlusal Schemes (classical Q in viva exam)

Stability of denture means the sum of adequate other function ( good retention , support and occlusion)

poor retention will lead to poor stability

poor occlusion ; when the pt bite the denture will move from its place so its not stable

bad support ; firm mucosa on one side and flabby tissue on the other side , when the pt bite on the flabby side the denture will move ; there is no stability

3 types of occlusion we can use in Complete Denture:

1. Balanced Occlusion : it is the minimum requirement for adequate occlusion in Complete Denture
2. Monoplane Occlusion
3. Lingualized Occlusion

Sorry for any mistakes……. Good Luck