We will talk about the Occlusion in restorative dentistry:

Simple :single crown...

Advanced:full arch,four unit bridge...

We will start talking about two approaches:

1-the confirmative approache.

2-re-organized approache.

What is our aim?

Our aim is to provide a restoration that is in harmony with the existing occlusion and that will not have any negative effect on teeth,alveolar bone, periodontal ligament, neuromuscular and articular surfaces.

Problems of high restorations:

Fracture of restoration,fracture of tooth,periodontal problems and TMJ problems...

This depend on the severity of the problem,time and pt factor(adaptive capability).

The starting point is the Examination, this is what we always miss, we should start with examination, look at the tooth and see the occlusion on it before start doing your restoration.

For example if you want to do a restoration on a canine, you should look at this canine and examine it … is it a guidance? Does your patient have a canine guidance on that canine I want to restore? What should I aim afterward? Should I restore the guidance on it?

The conformative approach:

So the definition of the conformative approach is the provision of restorations in harmony with the existing jaw relationships in both statics and dynamic occlusion

When it is used?

The patient has an ideal occlusion.. this is very rare to happen only 10% of the population , it is when the patient has the centric occlusion coincide with the centric relation, with anterior guidance free from posterior interferences.

What is the properties of ideal occlusion (comfortable occlusion)?

Simultaneous, well distributed contacts in centric occlusion, stable centric occlusion and there are no interferences in lateral and protrusive movements.

The patient free of TMj problems and does not have an ideal occlusion however the provided restoration will not change the patient’s existing occlusion.

\*\*In some rare cases when you have single crown ,or two crowns and you don't go forconformative approach you do re-organized occlusion,when the crown located posterierly on 6 or 7 for example and has deflective occlusion of interference.

In reorganizing the occlusion I want to change most of the contacts on occlusal surfaces of a large number of teeth, except sometimes you have to restore a single tooth but still you have to use the reorganized approach not the conformative one and this what you will do in two cases:

If the tooth which I want to restore has interference so I should eliminate the interference in the new restoration.

If the tooth to be restored is a deflective contact, for example tilted lower 7 and it is a deflective contact when the patient occlude in centric relation he/she bites on it then deflects the mandible to the centric occlusion so if I want to restore this tooth why not to eliminate it and give the patient something better

\*\*problems of under occlusion restorations:

1-over eruption of opposing teeth.

2-Then interference in occlusion either in lateral or protrusive movement.

 The dr showed us a picture for patient with non-working side interferences, in such case we should use the reorganized approach and eliminate the interferences,because the pt has unhealthy occlusion but within the limit of conformative approache.

\*\*You should know the differences between centric relation and centric occlusion:

Centric relation:jaw relation(maxilla to mandible)

Centric occlusion:teeth relation

What is an ideal centric contact?

\_at both sides.

-cusp to fossa relationship.

-we don't like any inclination,because it will increase stresses.

So it should be in line with the long axis of tooth and simultaneous with other contacts. Try to avoid infra or supra occlusion.

What is the technique of the conformative approach?

EDEC technique :we use it in direct or in indirect restorations,It means:

 E= Examine your occlusion, D= Design your restoration, E= Execute the restoration, C= check it.

EDEC principle for direct restorations:

First of all I should examine the occlusion of the patient and the tooth I’m going to restore it.

Also we can use this principle in indirect restorations, we examine the pt then we do pre-treatment records and then you start your preparation then you do good provisional restoration with good occlusion ,and you have to send good mountened cast to the lab then you do your final restoration.

Bite records:

-2D or 3D.

two dimensional bite records: photographs or written records (more precise) or occlusal sketching. In clinic when we want to record the occlusion of the patient we should have an idea about many things such as the static stops when the patient closes in centric occlusion where are the stops and we should see on right lateral if there is a guidance and if there are any interferences, the same thing on the left side and if there are interferences in protrusive movement.

How could we see the interferences in eccentric movements?

First thing we train the patient to do the movements then we use an articulating paper and ask the patient to bite in centric occlusion then we flip the paper and ask the patient to do the movements if any lines showed on non-working side this means there are interferences on that side. You can also ask the patient if there are any interferences and he/she can tell us.

This is very important especially in the comprehensive cases, we should take proper history and examination, study models, radiographs and occlusal records.

Three dimensional bite record: you record the spatial relationship of the prepared tooth to its antagonist, other teeth should contact as before. When you put the biting material on the prepared teeth the other teeth should occlude on each other.

 Incentric occlusion (CO) we take the bite by soft wax & asking the pt. to close completely (interdigitation, maximum intercuspation ,we need to see the wax perforated

If you are mounting the cast in centric relation (CR) the wax shouldn't be perforated .(centric relation has nothing to do with teeth ,its related to the TMJ)

If my patient has proper max.intercuspation I mount the cast directly on the articulator .

Materials used in bite registration :

-elastomers :

Very nice because it's fluey so the pt. close on it (use it to record CO ), occlufast its one of the trade name of elastomers.

-acrylic resin: (duralay )

Very accurate, we don’t put it all over the teeth we put it in the areas where there is no stability of max.intercuspation (ex.repaired teeth ).

-hard wax .

Guidelines :

The bite material is used only between the prepared teeth and not in the full arch ,why?-

Because in the unprepared teeth the casts are stable while in the prepared teeth the cast will flip that’s why we use acrylic resin.

-It must not contact the mucosal surface.( Only on the occlusal surface)

-multiple recording may be done to confirm the relations .(because the CR is very critical )

I will take 3 records and 2 of them are similar because the definition of CR :its reproducible relationship.(it's your reference in reorganized cases )

In most pt.s the existing occlusal scheme is functional,cosmotic ,comfortable so the most appropriate way is to adopt the confirmative approach (which is to provide treatment within the envelope of static & dynamic occlusal relationship of the own pt. )However there is some situation where we can't adopt it .

When treating advanced restorative cases the confirmative approach might not be appropriate (advanced means multiple restoration for the full arch) .when multiple posterior teeth are prepared you lose your reference starting point make it impossible to return to the preexisting occlusion (preparing the 4 to the 7 on one arch and you didn’t take any occlusal record before >>we lost the contact in this area so I have to go with

the reorganized approach .

But there are some tricks to help you to stick with the CO :

Pt with CO ,comfortable with it ,no problems ,no deflective contacts >>I want to prepare 4 teeth >>what I do sometimes is prepare one and leave the next one and prepare the third one >>by this way the pt. still have max.intercuspation >>I do record at this stage for these teeth >>then I continue the prep to the 2nd and 4th one .

When the comfortable approach is not appropriate :

1-we need to raise the vertical height.

Once you raise it its for sure an reorganized approach .

2-teeth are significantly out of position.( Sever malocclusion .)

 3-if you change the ant.teeth (you change the anterior guidance which is important in function ,appearance )

4-history of fractured exciting restoration which indicate the presence of interferences and deflective contacts >>the pt. has occlusal trauma >>so we make new crowns with new relations.

5-recurrent of TMDs that has relapse after splint therapy .

Changing the occlusion without having a plan for new occlusion and jaw relationship is an unorganized approach.

The aim of reorganized approach:

To provide a restoration which although change the occlusion, but it will be tolerated by the patient.

-A poorly tolerated reaction could cause TMDs, occlusal trauma to PDL, mobility, fractures, excessive root surface loss and hypersensitivity(in pt with bruxism and parafunctional habits ).

So the reorganized approach provides an ideal occlusion at tooth level, at the articular system level and at the patient level, it means the patient should be happy with the new occlusion.

At tooth level means we try to make multiple, simultaneous, well distributed contacts, cusp to flat fossa contact, no cusp to incline, the occlusal forces directed along the long axis of the tooth.

Smooth shallow guidance contact, for example not to make the angle between the upper and lower canines very steep (upright), and by doing smooth shallow contact we decrease the load on the teeth and relax the muscles. The patient with class2 div 2 have a wear on lower teeth because of deep bite ad muscles stress .

Articular system level means to have CO coincide with CR as you can, to have freedom in CO (not to have very high cusps because when the patient occludes he/she will have locked maximum intercuspation and this is not comfortable to the patient and he/she will not be able to do the movements easily) and not to have posterior interferences (at two levels, lateral movements and protrusive movements).

How to reorganize the occlusion that is ideal ?

Using EDEC principle, first step is to provide appropriate occlusal scheme before delivering the final restoration by making diagnostic wax up (mock up), it is very important to make wax up for teeth to study the occlusion of the patient and to make provisional restoration.

EDEC principle:

Examining phase… you record the jaw relationship in CR, in reorganized approach you don’t have any true repeatable reference in patient’s mouth except the CR, so your bite will be a CR bite using bimanual manipulation of Dawson, you position the patient on his/her back, put the two thumps on patient’s chin and your four fingers on the mandible, then you try to do a rotational movement to the mandible but don’t let the patient to close completely (the teeth shouldn’t touch each other, there should be a separating material between upper and lower teeth, for example: wax). Doing this technique in some patients is very difficult, you have to do deprograming for anterior teeth (forgetting the memory of teeth) using piece of resin or cotton roll and ask the patient to bite on it for few minutes, by doing that you tire the muscles to be able to close the mouth incompletely.

Anterior deprogrammer device (Jig of Lucia).its a piece of acryl we put it on the anterior teeth to deprogram thethe neuromuscular system .sometimes the occlusion splint is deprogrammer .

Then you examine static and dynamic occlusion of the patient and mount it on semi adjustable articulator with a face-bow. Then you design doing a wax up , and take the contacts and guidance of your wax up. Sometimes you need to do selective grinding for the cast if you have cusp tip interferences then you do the same selective grinding inside patient mouth. We allowed to make selective grinding for very little amount of enamel, if there is heavy interference and it doesn’t disappear using selective grinding you have to think elsewise, you might think in onlays for example.

Then you have to design the curve of spee and curve of Wilson.

the diagnostic wax up is very important step, through it you can discover that the patient needs orthodontic treatment before doing the reorganized occlusion for example, also it helps you to do ideal occlusion, optimal crown preparation, and to verify the treatment plan.

Execution phase:

Sometimes you do selective grinding, sometimes you need to refer the patient to orthodontic department. At the end you do provisional restoration then final restoration .

Checking phase:

-makesure your patient is comfortable with the restoration.

-You need to convey proper occlusion to the lab. the diagnostic wax up helps the technician to copy what you have on your wax up to do the crown. How does he do it? For occlusal features he do index using silicon on your wax up then he transfer it on the crown he makes then he copies it.

-How do you copy your anterior guidance?

You put acryl on your incisal table(customize your incisor table ) and you make acrylic block on your wax up model, it means you put soft acryl on your wax up model on articulator and you do the lateral and protrusive movements (anterior guidance).

Conclusion:

1. The ideal occlusion is a concept of treatment with multiple restorations, it is not a treatment objective by itself.
2. Examination of patient involves examination of teeth, periodontal tissues and articular system.
3. There is no such thing as a bad contacts.
4. The patient occlusion should be recorded before any treatment is done and compare the patient’s occlusion against the ideal occlusion concept.
5. Conformative is the safest approach.(because you will not change the occlusion )
6. Ensuring that you are using EDEC principle if you follow reorganized approach.