Sheet No.: 4

Refer to slides No.:

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The Metal Ceramic Crown Restoration

(Porcelain fused to metal )

-Biological width and it’s importance preparation in full cast crown:

Definition: it’s the length from the junctional epithelium to the crest of the alveolar bone.

It’s size varies from patient to patient and from tooth to tooth , it can be as short as and…… can reach 4 mm (avg = 2 mm) .

It’s importance in preparation is that the margin of restoration and crest of alveolar ridge most be at least 3 mm this mean there is some cases in full cast restoration they put the margin of restorative material subgingivally (below free gingival margin).

The problem is that when the margin of the restorative restoration reach junctional epithelium this will cause irritation to the patient , it might lead to attachment loss of the junctional epithelium which would lead to attachment migration and pocketing .

So we should avoid subgingival placement of the restoration except in some situation we place it supra or equi-gingival , but when we forced to do it subgingivally for an esthetic reason (anterior teeth) we shouldn’t place more than 0.5 to 1mm (depth of the sulcus) so not to place our restorative margin on junctional epithelium .

Biological zone : is the sum of free gingiva and biological width

Another terms used to describe this zone are :Dento gingival

complex,dento gingival unit and Supra crestal Gingival tissue .

Sulcus , epithelial attachment and connective tissue attachment all of them equal 2.7 mm .

If we make involvement of the connective tissue attachment , attachment and crest bone will decline ; so we will have a new biological width, sometimes you are forced to involve it like when you need to lengthening the crown .

Indications:

1. Esthetics : In esthetic zone we can use porcelain fused to metal or full ceramic crown .
2. If all-ceramic crown is contraindicated **: this indication was in the past but know there is no difference between all-ceramic crown or porcelain fused to crown , you can make the core zirconium dioxide (ZiO2) and fuse it with porcelain ( so you have metal core zirconia which is strong and have high resistance ).**

**In the past it was useful when we want to make anterior bridge using material called inceram (**Aluminum oxide) when u prepare the finish line it will be thick ( you need to have a good thickness of the material) it was contraindicated in this situation like if you want to make six units bridge for lower anterior teeth so you should shift to porcelain fused to metal.

**3-gingival involvement :**

**It’s better to place glazed porcelain on margin subgingivally than placing metal**

**Ex :If there is a need to place a full cast restoration in lower 6 subgingival like when there is deep amalgam restoration extended subgingivally**

**We don’t place metal because it will cause allergic reaction but we but glazed porcelain that we can polish it so it won’t cause allergic reaction .**

So when we have gingival involvement we should do all-ceramic crown or PFM crown rather than all-metal crown for two reason :

1-Allergic reaction from the metal.

2-Porcelain is a glaze material (smooth) rather than metal which is sharp even if we smoothing it will still sharp and it will irritate the gingival.

**CONTRAINDICATIONS :**

1-Large pulp chamber (in young patient ):To avoid pulp exposure .

2-Intact buccal wall: in some cases when partial coverage restoration indicated and the buccal wall is intact so we leave it no need to prepare it because sometimes it’s difficult to simulate the normal color of the tooth.

1. When more conservative retainer is technically feasible.

ADVANTEGES:

Superior esthetic in comparison with full cast crown>

**DISADVANTAGE:**

1. Removal of substantial tooth structure ( you will remove enough amount of tooth structure to allow sufficient space for metal and porcelain.
2. Subject to fracture because porcelain is brittle( if the patient clench on his teeth for a long time it’s better to use full cast restoration) .
3. Difficult to obtain accurate occlusion in glazed porcelain

So it’s preferable to do try in of porcelain in bisque stage before it become glazed .

1. Shade selection can be difficult :

There are many teeth difficult to do shade selection for them .

1. Inferior esthetic in comparison with all-ceramic crown .
2. Expensive.

Some people consider all ceramic restoration have more beautiful brightness especially when we use emax ; the teeth will look like a natural teeth .

Development of preparation of finish line :

In the past they used to cover the occlusal surface and contact area by metal because porcelain was weak but nowadays they improve porcelain so it’s not necessary to make the occlusal surface from metal.

On the labial surface firstly they make bevel to the finish line to make seal using silver alloy as restorative material then they develop it to make the finish line without bevel then they make the metal extention shorter and use porcelain to make the whole margin of restoration finally they shorten the metal labially (make it thinner ) and put an obaque layer so the metal will not appear through porcelain since porcelain in the gingival area is thin .

Note : deep chamfer finish line is the best to use .

Dr showing a pic and asking which tooth been restored “it was the second premolar” he said that the technician can do some features on the tooth like fluorosis signs and translucent areas and so on.

Now the Dr is talking about an another pic and that when we are preparing the tooth the reduction differ depending on the type of material to be placed on that preparation. He said that the incisal reduction is atleast 1.5 mm so we leave enough space for the technician so he can simulate the translucent layer of the tooth to get harmony between the restoration and the adjacent tooth.

Note: Dr said it’s important to leave 2 mm on the functional cusp as clearance and to measure it by wax or by a condenser with width of 2 mm and pass it while the patient is biting on his teeth to be sure.

Dr added that we can perform porcelain fused to metal preparation on incisors, canines and molars, but said we need to always remember that we have 2 inclination in the tooth surface which is “cervical third and the middle & incisal third together”. He said that the incisal & middle inclination must be more than that on the cervical third so we can adapt the body of the restoration to simulate the adjacent tooth so we get a better look.

“Dr describing a pic and said that the cervical inclination must be along the long axis of the tooth but the incisal middle inclination must be more inclined lingually or palatally. He added that even if the tooth is straight we have to do the inclination because we need space to get enough thickness of the porcelain to make it look like a normal tooth”.

“Dr asking someone to do a presentation on tapering”

Back to lecture, the Dr said that it’s important to know that the best finishing line is **Deep Chamfer** and never to do any finish line other than chamfer which works for porcelain or porcelain fused to metal. Also said that shoulder finish lines causes concentrated stress and can cause fracture on the cervical part of the restoration.

Now the Dr said that there is 2 types for anterior teeth preparation for the porcelain fused to metal preparations which is **Winged** and **Wingless Preparation.** In the **winged preparation** we prepare the labial surface with 1 mm reduction and we prepare the lingual surface with 0.5 mm beyond the contact area (leave the contact area intact and prepare the lingual surface) so we end up with a wing as a result, we don’t draw the wing it’s a resultant of the preparation. While in the **wingless type** we go gradually from the lingual surface of 0.5 mm reduction to 0.7 at the contact area portion and then to 1.5 mm at the most labial surface.

Dr noted that we must be carefull of the pulp chamber while doing our preparation because it differs from patients depending on the age as following: “Old patients = small chamber, Adult patient = large chamber”

“Dr talking about some stuff happened to him”

Now back to the lecture, the Dr said that the reduction also differ depending on the position of the tooth to be restored and the adjacent tooth position too, and that so we can mimic a normal look and harmony between the preparation and adjacent tooth.

At the end the Dr said that Dr sousan will tell us about the preparation layers and he said that every layer has its own reflection upon lights and that the reflection differ between lights (from dark places to sun light to room lights and so on), but the most important thing we need to do is the harmony between teeth. He added that the premolars can be prepared as winged and wingless too.

The End

\*\*Note: there is some numbers we couldn’t hear because the voice was very low and the record quality is bad ;( sorry for that and sorry for any other mistakes

Goodluck ;D