FRAME WORK DESIGN

In the previous lecture we ve talked about porcelain fused to metal and its layers , usually we have core made from metal then we have the 1st layer which is the opaque layer used for masking the metal color the opaque layer is slightly yellow-green in color so if too much layer is added the porcelain will appear yellowish in color looking like clay , then we have the body of porcelain and the translucent which is translucent to mimic the incisal edges and cusp tips

the thickness of the metal ( which is the most important thing) when working on noble metals we need thinner sections less than 25 mm , in the past they used to have the occlusal surface all made of metal .

The joint between metal and porcelain should be always right angled if not the area will be weak leading to chipping . in the past the palatal surface was opposed by metal eg: the lower incisal edges they were hitting on the metal palatal surface of the upper leading to chipping and abrasion but nowadays we use complete ceramic or full coverage of the metal

-about extension , when we use partial coverage of porcelain for metal core extension should always be beyond the contact area in anterior teeth for esthetic reasons and for posteriors they were using it made out of metal for lowering the risk of abrasion on the adjacent teeth because porcelain opposing adjacent teeth or adjacent natural teeth we have a % of abrasion , porcelain makes 40 times more abrasion to teeth than other material that causes abrasion and when metal makes abrasion to the teeth the % is less than half than porcelain

HOW TO TEST FOR ABRASIVITY OF PORCELAIN ?

By bringing natural teeth and porcelain and making the contact mechanically (friction) and they measure it either by :

1-measering the weight that got abrased

or

2- measuring the thickness in micrometers

And for restorations on the cervical areas we measure the abrasivity by using friction with a brush

LABROTARY STEPS

1-impression taking after preperation

2- working cast making

3-making something called dye

4-invesment

5-casting

RETAINERS : more than one type , either major or minor

major retainers are used for full coverage , onlay. For a posterior bridge it should not be less than MOD inlay (for retention) and it should cover the occlusal surface and for incisors we usually do full coverage

minor retainers doesn’t need full occlusal coverage it can be complete or partial

-intra coronal retainers used as only minor retainers except if it is MOD with occlusal coverage

MATERIALS OF RETAINERS

1-complete cast

2-porcelain fused to metal

3-full ceramic

-alignment for abutments is very important FOR RETENTION , in case of non aligned teeth they can’t be used as retainers because we can't achieve path of withdrawl , IF WE DON’T HAVE PATH OF WITHDRAWL WE CAN GO FOR CANTILEVER BRIDGE : SHOULD HAVE DOUBLE OR TRIPLE RETENTION TO AVOID THE OCCURANCE OF BENDING to the pontic .

- in case of endo treated tooth and mal aligned then you are free to prepare it and make it well aligned

- In some cases you can’t go for cantilever bridge to solve the problem of mal -alignment we can choose to do RCT for the tooth and make it aligned and to be used as a retainer , but not in our cases .

APPEARANCE : for any part of the bridge it should mimic the natural tooth structure/appearance ( the lowest one in esthetics is the metal and ceramic and porcelain fused to metal is much more esthetic )

CONDITION OF ABUTMENT TOOTH : it should has certain height for support

COST: you should always have at least two options for the patient so he/she can choose what is suitable for him/her , gold core with porcelain costs more and porcelain fused to metal costs more than the metal.

PONTIC DESIGN : same as the retainer ( placed for esthetics and function )

* good appearance
* Stabilize the occlusion
* Masticatory function

BIOLOGIC FACTORS :-

-Cleansable(1st priority): designed to be accessible for the brush to go underneath

MECHANICAL FACTOR:-

-it should be rigid to withstand masticatory forces

ESTHETIC FACTOR

PONTIC SURFACES

1-occlusal : stabilizes the occlusion

2-connectors on the side (proximal):stabilize occlusion.

3-buccal :natural teeth appearance

4-ridge surface(most imp) : more than one type a)hygienic (still used) for lower molars b) egg-shaped :for narrow ridges (lower anteriors or sometimes PM) c) ridge lap :completely laps(covers) the ridge (most esthetic but it is difficult in cleaning so they use super floss and it became achievable when they elevated the lingual part to be accesable for the brush while keeping the buccal in place for esthetics) d) modified ridge lap

* To clean underneath the pontic and ridge surface , super floss is used ,it’s like a spongy thread ending with plastic thread on both sides (thin-sponge-thin).
* When we remove a long bridge we find redness underneath it’s not an inflammation its due to keratinized tissue (friction) the problem is it might be associated with ulceration and bleeding , in case of patients having inflammation not because of the bridge we cover the teeth with provisional crowns and we will leave this area for 1-2 weeks to heal , after healing cement the bridge if it was in good condition and if the bridge isn’t you go for a new bridge but you have 1-2 weeks to take an impression so the gum undergoes complete healing .

-in bridges we try to put the connectors in the middle or toward lingual/palatal to be able to make disc separation for porcelain and to give more natural appearance

CONNECTOR DESIGN : tested by making a bridge and a certain design then they apply force either cyclic forcer or static , oval and slightly flat design is so far the best option to use

CONNECTORS MATERIAL :

1-cast 2 –soldering (welding) (in case of mixing 2 materials) 3 - ceramic (in case of porcelain) 4- non rigid ( when we don’t have path of withdrawl)