Prosthodontics sheet no. 2

Lec.2: surveying of RPD.

Done by: Nisreen Alkouz and Elaf Alomoush.

Corrected by: Nisreen Alkouz and Elaf Alomoush.

This lecture will be about surveying of RPD, guiding planes and rest seats for posterior teeth.

 -Surveying: the procedure of analyzing and delineating the contours of abutment tooth and associated structures;

- analyzing : because always we start surveying using the analyzing rod and must be sure about the accuracy then

- delineating: using carbon marker.

-types of surveying (depending on the cast):

 - initial on the primary/diagnostic cast (the cast which we do our modifications on) then we take impression and pure the master cast.

 - final on the master cast (the final cast which contains all modification we did, eg: rest seats, guiding planes,...)

-why do we do final surveying on the master cast?

To be sure that the preparations I have done will do their objectives;

Fore ex. If you decide to do guiding plane on mesial side of lower left 5, in order to know if the preparations were enough; proper under cuts, proper guiding planes.. we do surveying on the master cast.

-objective of surveying:

Same as slide, but note that:

The most bulbous part of the teeth= height of contour

- We can know where the retentive part of the clasp will be putted exactly (next lecture topic).

- The depth of undercuts horizontally; we measure the undercut using the undercut gauges .the cylindrical part must touch the survey line while the circular part must be in the undercut area.

-single path of insertion will be achieved when we have proper guiding planes.

In the case of convergent or divergent abutment teeth there will be multiple paths of insertion ( not preferred). In this case (the pic.), if we want to do guiding planes that are parallel, we have to do preparation (on molar). but it’s too much. So as alternative there is a rotational path of insertion. (we will take this in more details in the 5th year) إن شاء الله ☺.

\*the idea is: if you cannot do modifications to modify the tooth you will get benefit from the undercut to have more retention.

In the picture, note that there is a clasp on the anterior tooth but not on the posterior; we use the undercut instead. We only have one rest seat on the distal abutment but there is only one way in order to insert the tooth in its place which is the rotational movement.

Common path of displacement is always on the zero tilt. So when I do analysis for the undercuts at zero tilt I will assist the undercuts that will resist the displacement according to the common path of displacement which always directed 90 degree to the occlusal plane.

Displacement force may vary according to the type of food, its thickness,…

The tooth may only been dislodged if the displacement force > retentive forces.

To orient the diagnostic cast at zero tilt (occlusal plane parallel to the base),put the cast on the table and keep moving the hinge until you reach the wanted parallelism.

Depending on these factors you decide if you have to do secondary tilt or not:

* Retention. –aesthetic.
* Interference. –guiding plane.

Don’t do secondary tilt unless if your case need improving one or more of the previous factors.

When to do posterior/ lateral tilt?

Lateral tilt:

Like the example in the pic. In slide 37, which represent class2, in this case distal abutment is lingualy tilted. Here there is no way to insert our major connector straight up and down ( this is involved under interference category).

So, to overcome the interference do alternative tilt. In this case we do lateral tilt (tilt the cast “buccaly”) so the area which was undercut is not now undercut any more.

Posterior tilt:

1. if we have class 4 or (in this case) class3 with anterior modification we have aesthetic problem, we have black triangles and we get rid from these black triangles by posterior tilt .
so, we will get better appearance for the patient and we will have flat area so less interferences .

to let the flange adapt properly to the sulcus so we get rid of the space and instead of having a strait path of insertion 90 degree on occlusal plane , with posterior tilt will make the flange in contact without any interference .

**recording the degree of tilt**:
1- tripod method.
2 - scoring , on the base of the cast not on the sulcus ( must have enough thickness of the base ).

\*when we decide to make the design at zero tilt so common path of insertion = common path of displacement . If we have sufficient undercut, so the retentive part of the arm of the clasp will be placed in the proper place of the undercut and resist displacement of the tooth .
remember that we only do secondary tilt to overcome problems (retention…interference… aesthetic).

**tooth preparation for RPD:**
always we must remember that in patient mouth it differs, you must have upper and lower diagnostic cast regardless the case you have , even you want to work just on the lower cast . And you must mount them on an articulator, do occlusal analysis and only then you do planning and explaining to patient .
we don’t do that in the lab because every one have only lower and upper cast only .

\* How do we do our modification to the teeth ?
using diamond burs, it will provide a rough area, so we do smoothening after we finishing our preparation using special burs . we don’t do that in the lab because we work on cast not natural teeth .

**Guiding Planes**:
functions :
1- increase stability:
when you go throw one path of displacement the friction between the parallel planes and plates (metallic part of RPD).

2- reciprocation: (look page 4 1st picture)
the clasp(c-shaped) has tow arms :
- retentive arm ( in the picture , under the undercut buccally )
- reciprocate arm ( at the guiding planes )

now, if I have only the retentive arm which enter beneath the undercut it will give me enough retention .. but , what happen upon displacement?
the tooth will gonna move because it will push the tooth lingually until we lose it ☹

so , the reciprocate arm with guiding planes function/ importance is to :
1- prevent the tooth movement( protect the tooth).
2- stabilize the denture cuz we have flat surface will produce friction with reciprocate arm and give stability .
3- give protection to the retentive arm from being deformed .
If l don’t have reciprocate arm with guiding planes that keep continous tuch with the tooth upon removal , the retentive arm will deformed, it will keep flexing in and out during function and with time it gets deformed and we lose proportional limit .
(the Dr. said that you have to rememorize the term proportional limit :P)

so, if I have one retentive arm only, I will lose this functions of reciprocate arm.

**How we prepare the guiding planes ?**
using my alternative tilt , we get the orientation of the bur from the alternative tilt on the cast and transfer it on the tooth with the same orientation.
thus , I will remove the undercuts and prepare my guiding lines .

Here, maybe I have some degree change in the bur from the cast to the tooth so in clinic, I have the cast and my alternative tilt on it, and we take quick alternative impression (not the secondary) pour it , make surveying , this to ensure that our preparation is very proper and accurate.
so we don’t depend only on our vision in preparing the guiding planes.

After that , if we notice that we still have some modification by using analyzing rod ,we make it , and then we make our final impression (master)
and master cast. Otherwise, your master cast will be wrong and you will need more modification and another cast (lost time and money).

There is more precise approach for preparing guiding surfaces . we make our preparation of the diagnostic cast and then we fabricate something called " Jic"
made of acrylic resin . we can transfer it from the cast into the patient mouth as a guide of the exact amount of preparation we need.

**How much we should remove?**always our preparation should be in the enamel, about only 0.5 mm around the tooth is enough.

- we should not cut the tooth in flat way . must follow the contourof the tooth.
proximally : it will appear flat because of parallelism . but occlusally :it follow the contour of the tooth .
(in page6 … 1st picture.. red area>>wrong…. Green area >> right)

**The hight of guiding planes :**2/3 tow thirds of the height of the crown. **The width:**either in the half way between B& L cusp tip.
or 1/3 one third from the hole width buccolingually**.

\*** in the anterior teethalwaysthe preparation occur on the lingual sidewhile
in the posterior teeth we make it on the posterior surface.
-WHY? Because of the position of the minor connecter of the RPD.
its function is to connect all component with the major connecter so, of course in the anterior teeth it should be lingually wile in posteriors proximally because here were minor connecter will pass.

- (picture page 8) maxillary premolar : we have a bulge on lingual side I wanna get rid of it in order to have proper guiding line on the lingual side to act to reciprocation.
usually , there is no very bulbous area on the lingual side of the upper teeth .
but here , we have old restoration so we need to reduce the contour of restoration to provide a guiding plane that will help in reciprocation.

- according to the location of guiding plane we describe the function of it:
(in the picture page 8)
red area >>> proximally >>>increase the stability.
green area>>> lingually >>> act in to reciprocation.

as we said , we have 5 types of preparation on teeth :
1- guiding planes.
2- unfavorable survey lines.
3-rest seats.
4-………
5-………

**rest seats** :
functions :

1- produce a favourable tooth surface for support… the main function.
 2- prevent interference with the occlusion.
 3- reduce the prominence of a rest. Specially when we do preparation of the lingual side of the anterior teeth , the tongue is a very sensitive organ for any new thing in the mouth , so if I have a step between the rest and the tooth it will bother the tongue .so the rest seat inside the tooth will make it continuous and comfort.

**measurements of the tooth preparation( rest seat):**
buccolingually: either from B to L cusps >>> half the distance.
or from B aspect to L aspect >>> 1/3 of the distance.
mesiodistally : it depends :
-in premolars: 1/3 of the tooth.
-in molars: 1/4 of the tooth .
**depth and height** :
1.5 mm … more than that will be more rigid but remember that we must still in the enamel . and not going to dentine.

- its important for the preparation to be deepest at the central part .in the shape of spoon / saucer- shaped.
so, if I look to the seat proximally I will not be able t see the central part because it is the deepest . by this design, we ensure that the forces will be directed to the long axis of the tooth .

please , refer to the slides .. we just write the extra explanation
good luck all ☺