**Crowns and bridges: try in and evaluation.**

**Sheet #13**

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In the previous lectures we discussed: taking the impression, creating the provisional crown, selecting the shade and sending the impression to the lab where a working cast was fabricated containing the die.

In this lecture we will discuss the try in step. Which in the case of a porcelain fused to metal crown would consist of two steps: metal try in then porcelain try in.

\*\*the references of this lecture are: try in chapter in the fixed prosthodontics book and an article from which the figures and the tables explained in this lecture were taken.

So we have two stages in the try in phase: First the metal try in stage and then the porcelain try in stage which some people call the biscuit stage.

To begin with we **always start** with checking the metal or the porcelain on the cast before placing it in the patient’s mouth. Because if there was a problem on the cast most probably there will be a problem in the patient’s mouth.

And then you check inside the patient’s mouth.

\*\*side note: adjacent crowns are always made separately unless we want to splint the teeth together.

* **Checking the cast:**

\*\*So what do we check on the cast?

We start with checking the fit surface of the crown; we need good light and good magnification.

What problems could we find? Blebs or nodules, or bubbles due to casting in accuracies.

\*\*Other problems we might find on the cast are listed in the following table with their causes and remedies:

|  |  |  |
| --- | --- | --- |
| Remedy | Cause | Error |
| Return to the lab. | Finish line chipped (the cast is made of gypsum materials which have specific hardness and can be chipped upon removal and replacement of the metal leading to in accuracies) | Damaged dies (smashed, broken) |
| Return to the lab so the technician would apply it and recreate the prosthesis. | Technician not aware of technique or forgot to apply | No die spacer |
| Identify under magnification and remove with small round bur if it was small and away from the finish line. | Air bubbles trapped during investment.  (improper mixing, improper vibration) | Casting blebs (nodule) on fitting surface |

Notes about the table:

* Die spacer: is like a varnish material placed on the surface of your die except on the finish line (1mm above the finish line) to give space for the cement . If not present the crown won’t sit in its place or it will lift when cemented.
* How do we create the metal: we wax it and then an investment material is poured around it and then the wax is boiled up leaving space for the metal to be poured in. if there were bubbles in any of these steps blebs can result.
* In general we never ever use burs on the fitting surface of the crown except in the previous case with small bubbles away from the finish line.
* **Metal try in:**

What do we check in metal try in?

1. Marginal integrity (no open margins, no positive ledge, no negative ledge.)
2. Stability.
3. Clearance for the porcelain (Substructure design): if the metal was already in contact with the opposing teeth there will be no space for the porcelain

* Some people add retention to the things we check in the metal try in, the dr. wouldn’t add it because the retention is completed once the micro gap is filled with cement. So metal doesn’t give us a clear idea about the retention.
* **Marginal integrity:**

We place the metal in the patient’s mouth on the prepared tooth and we start checking our margins with a probe.

* **Stability:**

The metal does not rock.

We place the restoration and we apply pressure on various areas and it should not rock or rotate.

When does rotation occur? When we have a single crown with a faulty preparation.

Causes for instability might be a bleb or distortion in the fit surface creating a fulcrum which causes rocking.

\*\* Side note: we do ditching to allow us to fabricate good margins for the crown.

* **Substructure design:**

It means that we should have adequate space for porcelain. Also called clearance.

So metal touching the opposing teeth, what are the faults?

1. Not enough occlusal reduction (dentist).
2. Very thick metal (technician); Thickness should only be 0.3-0.5 mm depending on your metal.
3. Metal is not fully seated. (This is the first thing we check.)

* **We also check the connectors** (since no porcelain is covering them yet):

1. We check for bubbles, nodules.
2. Adequate thickness (not too thin).
3. Area for hygiene. (After we put porcelain).

* **Porcelain try in:**

We start with clearing the remnants of the cement on the preparation from the provisional crown step to allow the crown to sit properly.

Sometimes the crown wouldn’t sit properly due to problems in the fitting surface. This shouldn’t happen if you did a metal try in before. But if you didn’t this could occur.

To know exactly where the interference area is we use pressure indicating paste (disclosing paste, spray). We apply it on the fitting surface and we place it then we inspect it, if there were touching areas this means it’s a pressure area that should be relieved.

* What we check:

1. Proximal contacts: The dr placed them first because the first thing that could prevent the seating of your prosthesis is the contact.
2. Marginal integrity.
3. Occlusion.
4. Esthetics.
5. Pontic design and connectors.

* **Proximal contact:**

How do we check our proximal contact?

We first check it with floss then we apply pressure indicating paste or use articulating paper and we try to place our crown then we relief the marked area. The relieving should be gradual (small amounts)

Proximal contact should look like normal teeth contact in tightness and location. And it should allow an unwaxed dental floss to snap easily.

We relief tight contacts using a rubber wheel or mounted stone.

\*\* So we check with floss, mark with articulating paper, grind and polish with a rubber wheel or mounted stone.

\*\* Why do tight contacts happen?

1. When we don’t use provisional crowns and tipping of the adjacent tooth occurs.
2. Imprecise die location.
3. Abrasion of the adjacent stone on the working cast.

\*\* Why do open contacts happen?

Imprecise die location (movement).

In the case of open contact we return the crown to the lab for addition.

If gold crown: gold solder is added.

If porcelain crown: porcelain is added then fired.

\*\*side notes:

* Feldespathic porcelain is fabricated layer by layer.
* Addition porcelain has a lower firing temperature than the porcelain of the crown so that the crown wouldn’t melt.
* **Marginal integrity:**

Checked using a probe just like we check restorations: from the restoration towards the tooth, from the tooth towards the restoration.

* If from the restoration towards the tooth (from the margin of the crown towards the root) we found a step we call it a negative ledge.
* If from the tooth towards the restoration we found a step we call it a positive ledge. (In a restoration we call it overhang).

When we do subgingival margins it would be hard to check the marginal integrity. But still they should be checked.

We can use radiographs to check it.

A good margin should have no gaps, and should follow the tooth contour with no ledges.

Poor fit: when we have a gap larger than 50 micron.

\*\* 50 microns= the tip of a sharp probe.

If more than 50 microns we will have an open margin which will lead to microleakage , caries and so on…

|  |  |  |
| --- | --- | --- |
| remedy | cause | Error |
| Remake the crown. | Poor impression, poor die trimming (ditching),  Difficulty in identifying finish line (unclear finish line; eg. Feather edge) | Under –extended crown margin  (negative ledge) |
| Trimming (if there was no open margin) | Poor  impression, poor die trimming, extra wax or porcelain | Over-extended crown margin  (Positive ledge) |

Notes about the table:

* Main cause for both is poor impression.
* In trimming we never trim from below the ledge we might end up with and open margin but if we trim from the outside (from above) the margin remains intact.
* **Esthetics:**

It is very important to check esthetics inside the patient’s mouth because the technician didn’t have the patient to help him in esthetics.

We always place the crown in the patient’s mouth and modify it (especially in anterior teeth) using a diamond bur.

\*\* We always always modify the crown not the natural teeth.

* Shade:

Minor changes in the shade can be done. Usually if we have a lighter shade we can darken it using stains, but we can’t lighten a darker shade.

So higher value shades can be turned into lower value shades while lower value shades can’t be turned into higher value shades.

\*\* Sometimes in all ceramic crowns we can manipulate the shade using the shade of the underlying cement. It doesn’t work with thick crowns, but it can be applied in veneers.

* Morphology and contour:

It can be modified using diamond burs.

* **Occlusion:**

Centric and eccentric.

If the porcelain was glazed the articulating paper won’t mark it because it’s too smooth. So it’s better to do this step with crown unglazed and then send it back for glazing.

\*\*High occlusion results in:

1. Pain.
2. Mobility.
3. Fracture of the crown.

* Identified using:

1. Articulating paper.
2. Shim stock.
3. If the patient bites and the adjacent teeth are not touching then crown is high.

So we let the patient bite before placing the crown and we inspect the occlusion of the adjacent teeth and sometimes the contralateral side. Then we place the crown and let the patient bite again if the occlusion differs this means that our crown is high.

Also the patient’s proprioception helps us, he can guide us to where the problem is.

\*\* Under occluded crown causes many problems as well:

Overeruption, interference, the patient can’t eat on that side…

\*\* In anterior teeth we also start with ICP then lateral movements.

* **Pontic design:**

Should be verified as the design we sent to the lab.

Saddle design is very difficult to clean.

We also have: modified ridge lag, bullet shape, conical shape and so on…

The patient should be able to pass super floss or an interdental brush.

Finally, we do **polishing and glazing**.

* Unglazed porcelain leads to increased wear to the opposing tooth and can be chipped and cracked.
* If minimal modification of a bridge on a single cusp was made we can finish it using rubber wheels or other stuff and not glaze it again. Because too much glazing is not good also it can lead to unnatural appearance.

**Good luck**