Cons sheet no. 29 Prof. Fuad kadim

Written by Abdelaziz Al-Shawa

These are just extra notes for the lecture, the main information are included in the handout and not repeated here.

**Ceramics and Dental ceramics**

-ceramic is a general term and dental porcelain is a specific type of ceramic.

Regarding to the triangle which represents the different components of procelain (feldspar-quartz-kaolin tri-axial diagram)

Kaolin is the clay

Feldspar is referred to number of oxides

Quartz is the silica (SiO2)

-within this triangle there’re different materials : 1. ***dental porcelain*** which is located between feldspar and quartz so it’s not kaolin containing porcelain and thus called **feldspathic porcelain**

2.other types of porcelain such as ***domestick porcelain*** and ***stoneware*** are located almost in the center of the triangle and thus they are consisting of kaolin ,quartz and feldspar

-feldspathic porcelain is **the conventional porcelain** which is used with PFM restorations.

-reminder for PFM restorations construction : preparation of the tooth -> impression -> pouring the impression -> cast that is sectioned to dies -> waxing up on the dies -> investment of the wax pattern -> wax burn out ( so we get a mold which is the space within the investment material) -> casting of metal -> metal try in -> porcelain build up

-The criteria that must be checked in the metal try in (according to the priority ) : firstly ; marginal integrity Secondly ; retention , thirdly ; stability (no rocking) ,fourthly ; occlusal reduction (must be enough for the porcelain to be added)

-the opaque porcelain is added to: 1. Mask the color of the metal 2. Provide a chemical bond with other layers

-body porcelain = dentine shade

-incisal porcelain = enamel shade

-usually porcelain is supplied either as **powder** (which is mixed with water) or as small pieces called **ingots**

-for the powder form; usually for each shade (A1 ,A2 ,B1 , B2 ..etc) there’s 3 containers ,the 1st container is for the opaquer ,the 2nd for the body (dentine) and the third for the enamel (A1 opaquer , A1 dentine , A1 enamel)

-after adding each layer we fire the restoration in special oven then let it cool down , so it get condensed (sintering)

-you must examine the porcelain restorations carefully once you get them from the lab, not to have a cracks, otherwise the porcelain may break within less than a week.

-abrasion: is a tooth structure loss due to its contact with foreign body (like porcelain), attrition is due to tooth to tooth contact

-how can you determine the buccal and the lingual side of a PFM crown? From the metal margin (about 2 mm in height) showing on the lingual side , and this is a result of our conservative approach in tooth preparation , we make a shoulder finish line on the buccal side to accommodate the thickness of metal + porcelain, and a shallower chamfer finish line on the lingual side because it’s a hidden area and no need for additional cutting in order to add porcelain ,and if we cover this area with porcelain (keeping the chamfer finish line) , it’ll become over contoured

-how to determine the buccal and the lingual side of this crown in the try in stage (without porcelain)? From the step above the metallic lingual margin where the porcelain will start later (2 mm above the finish line)

**-**we can make a full ceramic restoration (full crown) made purely of feldspathic porcelain but this restoration will be weak , so we are not usually using it , it can be used on anterior teeth when there’s no heavy occlusion…as in an open bite case

- Voids in conventional porcelain are caused by hand mixing so we are tending to machine-mixing to avoid that

-glazing can be done in two ways : 1. Auto-glaze (self-glaze) after porcelain try-in we send the restoration back to the lab and they will do just a final firing for the restoration for one minute at certain temperature. 2. Sometimes they need to add a translucent thin layer of porcelain (glazing liquid) before firing

-glazing makes the restoration shiny by closing the porosity of the surface

-powder form of porcelain is used with these methods: 1. Powder condensation 2.slip casting

-ingot form of porcelain is used with these methods: 1.heat pressing 2.machine milling (CAD/CAM)

-refractory die: is a special stone material that can withstand heat and don’t interfere with porcelain during heating

-removal of excess moist from the porcelain past during powder condensation technique can be done using a small piece of tissue

Good luck