Cons sheet no. 29 Prof. Fuad kadim

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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 it’s 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 poder condensation technique can be done using a small piece of tissue

Good luck