Sheet no. : 16

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Veneers you can either do them in composite or porcelain , what is a veneer ?

Veneer : a layer of a tooth colored material that is apply to a tooth to restore a localized or generalized defect or discoloration .

We will talk about composite veneer and tips how to do a proper composite veneer to mimic the adjacent tooth , tips that has a relation to shade selection and the material itself of the composite , then we will talk about porcelain laminate veneer that most of patients ask about it .

First we have to know that the natural tooth compose of enamel and dentine , dentine is responsible of the color of the tooth because it’s the underlying substrate , while enamel is colorless it's made of prisms and it just reflect the underlying color of the tooth , when I know that about the tooth that I want to restore it with composite especially if it large class 4 you have to do something that mimic the dentine and cover it up with something that mimic the enamel .

We still talking about composite , but composite that replace the dentine more rich in color and less translucent , and the outer layer of your composite must be more translucent to replace the enamel , this called **mimicking the natural tooth** .

These properties we take them in color science where there : opaque , opacity , transparency and translucency , naturel teeth are **translucent** , so your composite should be translucent , but sometimes we may need to use opaque composite in certain cases.

Tooth malformation , we have different disturbances on anterior teeth that make you when you do your treatment plane for your patient to do a veneer for him , wither composite or porcelain .

What are these problems that you can solve using a veneer ?

1.deformation in tooth **structure ex : hypoplasia**

2.deformation in tooth **color**

3.deformation in tooth **morphology ex : microdontia , spaces , diastema**

4.deformation in tooth **alignment**

**composite veneers :**

if you build a veneer to close the space you should never put the incisal part same as cervical part , because the tooth itself at these places are not the same and differ in the translucency , therefore when you build veneer with one shade you wrong , its always you have to do layering and divide the tooth into different sections , the cervical part will be normally more colored and less translucent and the incisal part especially the 1-2 mm must be translucent same as the translucency of the enamel or the incisal edge .

we have certain things that we need to know when we talking about composite restoration , there something called **blocking out** , sometimes you need before you put your final veneer shade you need to block out the underlying color of the tooth , this occurs when the tooth severely discolored like tetracycline , you need to put a first layer which we called it block out layer which is opaque and less translucent which prevent showing the underlying color of the tooth because your final veneer color not depend on its color only also depend on undermining structure , it’s a combination between underlying and the veneer , always do multichromatic restoration never use a single chroma or hue for your restoration you have to do it multichromatic because we don’t have a natural tooth with one color .

next thing is characterization , sometimes you need to do characterization its important especially when you restoring a single central adjacent to another central has some sort of characterization , sometimes the central there is opacity on the contact or line or something , when you want to restore the adjacent tooth you have to try to mimic the one adjacent tooth , you cant do a tooth with a imaginary perfect restoration for it and the adjacent tooth has stain and hypoplastic areas you have to mimic to become more natural .

the opaque shade help you, some kits of modern composite have around 26 shade not 5 or 6 shade , we have something called AO2 which mean it A2 but opaque so when I decide that the shade of the tooth is A2 first l can put AO2 which is opaque to mask the underlying ؤخمخ to mask the colorlor of thA2 first l can put AO2 which is opaque to mask the color of the underlaying color then I cover it with A2 which is more translucent , by this we can get a very good shade of composite .

so for each shade of composite like : A1,A2,A3…etc. we have opaque composite like : AO1,AO2,AO3,…etc.

**NOTE** : opaquer are use to block out light and the underlying color

The dr. show us a pic of sever stain which we can't do it by put a thin layer of A1 or A2 only , you have to mask the underlying color and then you put your final shade .

Sometimes we put tent on our restoration to match an adjacent tooth that has a same craze line to look more natural , but first take the consent of the pt

**NOTE** : from A1 to A4 the opacity increase

**Factors affecting your shade matching :-**

1.you have to do your shade matching as quick as possible within 30 sec

2.at natural day light not under the yellow light of the clinic

3.the teeth must be clean

4.the operator might have color blindness

5.the operator is tired

6.ask your colleague to choose

7.choose at different appointment under different light condition to avoid metamerisim

Matching the existing shade it is a difficult task , you should always use the shade guider specific for your composite , we can't use the shade guider of the porcelain cause they are different material , let the pt participate in shade selection , if you are tired relax your eyes on neutral blue color and try to choose within 5 to 10 sec .

One of the good techniques to choose your shade when you are not sure of it or the shade guide → you can take **just a little bit** of your composite and you can put it on your tooth and select , you have to cure it because the color of the uncure composite is different , cure it without acid itch and bond and then just chip it away

**NOTE** : the shade guider not that much accurate

**Mock up** : building the whole veneer without acid itching and bonding with a color to make sure of it , then you remove it and put another one with acid itch and bonding , we do this when we have a time "not our 2 hr clinic"

The benefit of mock up is overcome the difference of the color of the composite on different thickness

Sometimes you blend colors to mimic the color of natural tooth, the principle of the color shade selection by overlying different shade of composite not mixing them. Ex: A1+A3=A2 this is wrong.

Remember to use the correct thickness, the final polishing will affect the final shade of your restoration, a polish composite will not look like an unpolished composite, the best polished surface of composite is when using a matrix either cervical matrix or mylar strip, so the oxygen layer is not exist, its finally polymerized, which will give you the best clusters and the best finish.

Direct composite restoration it is cheaper than porcelain restoration but it take a lot of time and skill.

**\*composite restoration:**

-Comparison between the two materials;**Porcelain laminate veneers vs Composite**:

1-It’s cheap, less cost than porcelain restoration

2-Takes a lot of time and a lot of skill

3-shades of the composite differ than the shades of the porcelain laminate veneers

4-Composite is going to stain with time.

5-in Composite we don’t remove a lot of tooth structure , more consrevative

\*The previous point has a question mark, because some doctors they do porcelain laminate veneers without preparations🡪 and this called the prep-less preparation.

6- Porcelain is brittle so the preparations for it is difficult then composite

7- Porcelain has more longevity

8-Porclain has a glossy surface and good texture which is not decrease with time

9-Porcelain makes more attrition with opposing nutural teeth more than composite

**\*Tooth preparation:**

Simple with very small chamfer bur you’ll prepare the surface and always stay in enamel especially for porcelain laminate veneer ( in composite its fine to reach dentin but Porcelain NOT) 🡪 If the enamel which underneath porcelain laminate veneers was less , the survival of Porcelain laminate veneer will be less too.

-If a tooth has a large class III from one side and a lager class IV from the other side, I can’t do porcelain laminate veneers in such a case 🡪 it’s indicated for a crown.

**-Intra-enamel preparation**: it’s a minimal preparation (you just prepare within the enamel).

\*composite placement: you do acid etching-bonding-spread your restoration then start adapting your composite (adaptation : you start from one side and spread your composite and this method will prevent bubbles and stains between composite layers 🡪 for good adhesion + bubbles free restoration

\*if your composite was viscous and it’s exposed to the light for long time, you’ll not have a good adaptation.

\*what’s the purpose of doing preparations on the teeth even if it was just a 0.1 mm?

the external surface of the enamel has a problem with etching and bonding, because it’s hyper-mineralized+ hyper-fluoratic+ sclerose sometimes, and this lead to difficult bonding , and once you remove this hyper-mineralized layer of the enamel you’ll achieve higher bonding strength and better restoration🡪 that’s the purpose of preparations

-How much the survival rate of the composite?

It’s a multifactorial, depends on the oral hygiene of the patient + type of composite+ and how much you did finishing and polishing for it , it range from 7 to 9 years

-When we do a crown rather than veneer? 🡪 When there’s a lot loss of tooth structure

Esthetics problems of the teeth are: Again

1-color

2-structure

3-morpholpgy

4- Alignment

-So these 4 categories you could solve with veneers

-but if the discoloration was too black , I can’t cover it with veneers , so these 4 categories I can solve them as long as if they were minor (minor discoloration , minor alignment… etc)

-**Indications for veneers:**

**1-Developmental discrepancies:**

Amylogenesis imperfecta +fluorosis + mild tetracycline stain + enamel hypoplasia (localized or generalized).

-Cause of localized hypoplasia: Trauma or infection of the tooth itself.

-cause of generalized hypoplasia: systemic disease (high fever+ some drugs)

**2-Acquired discrepancies:**

1. Caries
2. Tooth discoloration (variable degrees )

The most common type of tooth discoloration is tetracycline stains then hypo-plastic discoloration then hemorrhagic non vital teeth (this tooth we should do a vitality test for it 🡪 it’s a necrotic pulp, and after we do endo treatment we do internal bleaching and it works very well)

-Tetracycline stains: lines of bluish to grayish discoloration on teeth

1. Fluorosis (it’s a malformation in the structure of the tooth, and it’s severity depends on the dose and the duration of the fluoride 🡪 and that’s why fluorosis has clinical pictures very variable)

-Mild fluorosis start with little whitish opacities on the tooth without any difference in the texture of the tooth, and the whitish opacities may transfer to brownish or white brownish or this tooth may transfer to pitted and grooved and this depend on the severity and the duration of insult that occurred to the enamel.

**\*Treatment modality:**

1-Treatment could be according to esthetics or functional

When you have distruption in the structure of the teeth🡪the patient want the treatment to be depends on both; esthetics and functional.

2-Internal and external bleaching: (we will take a separate lecture about them later)

3-Crown restoration

4-Indirect resin veneer or indirect composite veneer

5-porcalin laminate veneer

(The previous one we talked about was direct composite veneers)

**Indirect composite veneers:**“

laboratory Composite” by taking an impression and make a model then send it to the lab, which is going to do preparations on the model and then final curing (for 1 hour) in certain light cure oven + ultraviolet light +under pressure🡪perfect and complete polymerization, finally you will receive it completely ready and then you just cemented on the patient tooth by resin cement.

**Adv:**

1- Because its highly polymerized its more durable, more aesthetic

2-Simple procedure in the lab

3-Less costy than porcalin laminate veneer

4-butter than direct in stain resistance and wear resistance ( but not too much )

**Disadvantages:**

1-Direct composite has better bonding than indirect , indirect is highy polymerize and has little free monomer resins left to do bonding with cement . It's highly polymerized because it's under heat and pressure that used in lab make it less bonding to resin cement.

2-highly polished surface can be obtained initially then it become prone to wear and abrasion and become rough , plaque retentive , not aesthetic

3-Insisal chip fracture is very common

Rare to be done because dentists prefer to do direct composite or porcalin laminate veneer in the lab

**Direct composite veneers:**

when you work in patient’s mouth and do preparations inside the oral cavity.

Chair side , time consuming need a clinicin who knows morphology well

the initial results be very good , but after 4-6 years surface staining will occur , because it's composite which has a low abrasion resistance .

can be used only for minor surface defects and staining , but in severe cases we must use indirect method

**full coverage crowns**

need extensive preparation and not a conservative choice of treatment , contraindicated for young patients because they have al large pulp chamber

**acrylic veneer**

in the past they used acryl ( PMMA ) as a veneer material but not anymore , why ?

1. limited shades
2. Bond with teeth is very weak and questionable
3. Little wear resistance
4. Porosities
5. Discoloration

So its bad from all aspects

**Porcelain laminate veneer**

Tooth colored restoration , thickness from 0.3 to 0.7 mm cemented on labial surface of anterior teeth by resin cement , designed to cover any existing surface defect , discoloration , alteration in size or morphology and alignment of restored teeth.

**Historical background :**

Use of porcelain laminate veneer goes back to late 1930 , they were used in Hollywood to temporarily improvement appearance of actor's teeth during film making , as Dr.Charles Pinces stated that veneer is placed with denture adhesive powder , then it can be removed after finishing of film making

- in 1955 Bunocore described a new material of obtaining bonding between a resin filling material and tooth enamel using phosphoric acid , so this is the first time that acid etching enter to dentistry ( adhesive dentistry ) , as we study , acid etching lead to :

1-microporosities ( increase surface area ) 2- increase surface wetability

- in 1975 ,Alein Rochette , a French dentist ,start thinking about porcelain veneer , but in this period still there is no resin cement , so the restoration is bonded to etched enamel by a layer of unfilled resin ( bonding agent ), they try to bind porcelain veneer on enamel by bonding agent , but this bond was weak and can't withstand forces and stresses , also porcelain need to be etched although the idea of etching of porcelain was not available but they thought that using saline coupling agent that was applied to porcelain will be enough as chemical adhesion material and providing a mechanical retention , actually no bonding false over 3 years ( it's an acceptable result ) .

- in 1983 ,hydrofluoric acid was discovered , at beginning it was used to etch glass , and because porcelain contains glass ( silica glass ) , so can be etched by hydrofluoric acid

**Advantages** of PLV comes from high quality of material and conservative nature :

1. Conservative ( minimal tooth reduction from 0.3 to 0.7 ) , amount of reduction depend on area on tooth cervically less than incisally
2. Optimal aesthetic
3. Biocompatible
4. High Abrasion resistane
5. Can mimic translucency , color , contour of teeth and its stable over time
6. Brittle material but once its cemented it has optimal strength

**Disadvantages:**

1. Brittle material , so be careful in the try-in , that’s why it's preferable to do the occlusal adjustment after cementation
2. Technique sensitive
3. Cost
4. Detection of early caries underneath is very difficult

\*\* **Indications** :

1- anterior discoloration , porcelain veneer not only be in labial surface but we do overlap preparation ( preparation in labial and palatal surfaces ) , but be careful to not include incisal edge in preparation because it’s the end of anterior guidance and interface a high stresses so if covered by porcelain will chipped easily .

2- closure of median diastema and spaces between anterior teeth

3- correction of minor cases of mal alignment

4- modify size and contour of restored teeth ( peg shape lateral is one of most common indication to use porcelain laminated veneer .

5- treatment of malformed teeth

**Less common uses : has some case reports but week evidence so don’t use it**

1- repairing crown and bridge work

2- creating undercut for clasps of RPD

3- retaining anterior bridge

4- veneer as wings or resin modified bridges

5- management of patient with anorexia & bulimia nervosa , who have badly destructed palatal surface , in this case we can put a porcelain veneer .

6- someone who don't have guidance , we put veneer in palatal surfaces , to establish guidance ( as canine guidance )

**Contraindication** :

1- badly destructed tooth ( no enamel and no tooth structure )

2- teeth with extreme stresses due to bruxisim and other parafunctional habits ( not totally contraindicated )

3- severe degree of discoloration

4- bad oral hygiene , those persons are not indicated to anything , are indicated to go home and brush their teeth and come back later ☺ , as patient selection has important impact on success or failure of restoration

5- patient is high susceptible to caries

**Best lf luck ;)**