June 7, 2018

AGD Annual Meeting-New Orleans

Aesthetic Anterior Composite- A Simple Technique

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I. Recognize restorable class III, IV, V, VI cavities of anterior teeth:

- Class III: interproximal of canines, laterals, and central incisors as in photos
- Class IV: marginal edges and corners of canines, laterals, and central incisors as in photos
- Class V: cervical / gingival 1/3 of canines, laterals, and central incisors as in photos
- Class VI: incisal edges of canines, laterals, and central incisors as in photos

- II. . Learn the structures of enamel, dentin tubules, acid etch:
- (1) page 9, Summitt's Fundamentals of Operative Dentistry, A Contemporary Approach, 4th Edition)
  - Enamel is made by ameloblasts beginning at DEJ growing outward to tooth surface. Enamel has tensile strength of 11.4MPA. Its rods & interrod enamel interwine to make a strong latticework and prism structures giving its strength for occlusal stress
  - Enemal structure composes of:
  - By weight, 96% Hydoxyapatie mineral of Ca & P -Calcium & Phosphorous, 3% water, 1% organic
  - For the bonding and adhesion surface area, we focus more on its volume: 85% Hydoxyapatie mineral of Ca & P -Calcium & Phosphorous, 12% water , 3% organic of fat & protein
  - Dentin is made by odontoblasts and give color and eslasticity to support enamel and also occlusal stress. Its tensil strength is 40MPA. structure composes of: 45-50% of inorganic apatite crystal, 30% organic matrix, 25%-20% water

- III. Learn the basic concept and components of dental adhesives and composite:
- (2) Page 328, Craig's Restorative Dental Materials, 13th Edition.
  - Strong and durable adhesion is accomplished by cleanness of tooth structures and by molecular interactions and micromechanical interlocking between tooth structure, adhesive (ClearFil SE Protect –Kuraray Dental), and composite resin(Herculite Ultra-Kerr Dental, Estelite Sigma Quick-Tokuyama Detnal) through covalent, ionic, or van der Waals forces.
  - Etch gels have 30%-40% phosphorous acid to demineralize tooth structures
  - Dental Adhesives compose of two main systems:

    1. Total Etch is also called Etch-and-Rinse or 3- Steps system and 2. Self-Etch systems.
  - Total Etch: Etch & rinse, then place primer, then use bond

- Primers are solvents of hydrophilic monomers, oligomers, or polymers. Solvents in primers can be acetone, ethanol-water, or just mainly water. Dimethacrylate oligomers and lower molecular weight monomers are added in primers of adhesives.

ClearFil SE Protect Primer from Kuraray has primarily water as its solvent. It contains Hydroxyethyl methacrylate and others as listed in the MSDS below.

Monomer for dental resin materials
12-Methacryloyloxydodecylpyridinium bromide (>90wt%)

· **Dangerous components:**
868-77-9 2-hydroxyethyl methacrylate H315; H319; H317 25-45%

· **Other ingredients:**
10-Methacryloyloxydecyl dihydrogen phosphate
12-Methacryloyloxydodecylpyridinium bromide
Hydrophilic aliphatic dimethacrylate
Water
Initiators
Accelerators
Dyes
Others

- Bonding agents are light-cured and contain camphorquinone as an activator and an amine. MSDS of ClearFil SE Protect from Kuraray lists these in their bond bottle:

· **Chemical characterization: Mixtures**
· **Description:** Mixture of substances listed below with nonhazardous additions.
· **Dangerous components:**
1565-94-2 bisphenol A diglycidylmethacrylate H315; H319 25-45%
868-77-9 2-hydroxyethyl methacrylate H315; H319; H317 20-40%
7681-49-4 sodium fluoride H301; H315; H319 <1%
· **Other ingredients:**
10-Methacryloyloxydecyl dihydrogen phosphate
Hydrophobic aliphatic methacrylate
Colloidal silica
dl-Camphorquinone
Initiators
Accelerators
Others

- B. Resin Composite is composed of 4 components:
- Organic polymer matrix
- Inorganic filler particles
- Coupling agent
- Initiator accelerator system

- Organic polymer matrix is a cross linked matrix of aromatic dimethacrylate monomers such as Bis-GMA (2,2-bis[4(2-hydroxy 3-mehacryloxy-propyloxy-phenl] and UDMA (Urethane dimethacrylate) are most used monomers in resin matrix.

- The following that are listed in the MSDS of Kerr Herulite Ultra Nanohybrid composite: 7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa5, 12-diazahexadecane-1,16-diyl bis-methacrylate, 2,2-bis(acryloyloxymethyl)butyl acrylate 2-ethyl-2-[[(1-oxoallyl)oxy] methyl]-1,3-propanediyl diacrylate, 10-30 15625-89-53-trimethoxysilylpropyl methacrylate 3-trimethoxysilylpropyl methacrylatele
- Inorganic filler particles consist of ground glass or quartz, sol gel derived ceramics, microfine silica, or nanoparticles.
- Coupling agents or silanes are added to inorganic particles by to surface treat the fillers before being mixed with the unreacted monomer mixture. Silanes form a bond between the inorganic and organic phases of the composite. (3) page 164; Craig's Restorative Dental Materials, 13th Edition
- Initiator-activator helps polymerize and cross-link the mixture into a hardened mass.
- TEGDMA or triethylene glycol dimetharylate or Bis-EMA6 (2,2 bis(4-(2-methacryloxyethoxy)phenyl)propane) are added to composite to reduce or control the high viscosity of Bis-GMA

- IV. Learn the simple technique of doing class III, IV, V, VI restorations.
  - Armamentarium: refer to photos of instruments for this technique
  - Burs of 55 diamond, #4 or 6 round bur, Brasseler DET9F FG Fine Needle Diamond 135F.31.014, 7901 FG Flame Carbide H246.31.009, 7408 OS1 FG Football Carbide H379.31.023 Helenbeck, condenser, mirror, explorer, mandrel, 3M softflex discs, Taflon tape/roll, 2*2 gauzes, ultra thin 0.0001 micron matrix band, unidose Kerr Herculite Ultra / Tokuyma Estelite composite capules, Biso Resin Modeling Wetting agent, composite gun, light cure unit.
  - Procedure/Technique: Refer to photos and video for this procedure

  - **Ask patient to sign Photograph consent form-attached is sample form.**
  - **Take photos before touching or doing any procedure**
  - **Completely Remove all caries as in photos**
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  - **This is very important: Completely Remove all caries as in photos**

  - Remove all undercut irregular enamel / dentin
  - Roughen up at least 5mm beyond the cavosurface or the final prep on facial of all preparations
  - Clean thoroughly all blood or saliva
  - Etch 15-20 seconds on all enamel surface, 5 seconds on dentin

- Rinse thoroughly for 30 seconds with air water spray.
- Make sure no etch gel is present
- Isolate prepared teeth from lips and tongue using firmly rolled 2*2 gauzes
- Air/ Blot dry not too dry
- Apply ClearFil SE Protect primer 20 seconds
- Apply ClearFil SE Protect bond, air dry gently
- Light cure 20 seconds
- Apply composite with one constant firm pressure from largest/widest surface of cavity to smallest as shown on video
- Use clean pinky tip or ring wearing finger tip with thin layer of Biso Resin Modeling agent to apply pressure and mold or shape composite to desired structure as shown on video
- Light cure
- Apply the next composite layer in continuous firm motion until the final restoration is achieved.
- Polish with 3M Solflex course disc on incisal and facial surfaces first
- **Then use Brasseler football carbide to finish and adjust occlusion.**
- **Check and adjust occlusion again at this time.**
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- Use Fine Needle Diamond bur then # 7902 carbide bur to finish the cervical and interproximal surface of restoration,
- Then use the used course disc to give final shape, then use fine and ultra fine to do final polishing.
- Floss and remove all layers of residues of bonding agent on gingiva and on adjacent teeth.
- Take final photos
- Finish.