“Simple Solutions to Esthetic Excellence”
The Direct Composite Experience
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Mini-Handout
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Topics to cover today...

• Patient motivation to enhance a smile – who are we treating?
• Why composite?
  • Posterior Composites
    – What’s up with amalgam?
    – Managing post-op sensitivity
    – Layering vs bulk fill…does it really matter?
    – A “Recipe for Success” with posterior resins
  • Anterior Composites
    – The “Best Kept Secret” in aesthetic dentistry
    – How to create direct veneers as nice as porcelain
    – Tips, tricks and techniques to create lasting smiles
• Surprises…and bit of fun!

Today’s Requirements for a Composite

• Universal use throughout the mouth - if possible
• Excellent abrasion/wear resistance
• High radiopacity
• Easy to finish and polish and maintains finish
• Superior esthetics: multiple shades + translucent
• User-friendly handling properties
• Low shrinkage
• Cures with multiple energy sources
• Compatible with multiple bonding systems

Options

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    – A “Recipe for Success” with posterior resins
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Why Composite?

• Conservative in nature
• Flexibility to restore only what is missing
• Use as a long term or transitional restoration
• Less costly to the patient than other “tooth colored” materials
Class II Dominates the Market!

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Posterior Composite Challenges

- Creating and maintaining an isolated environment
- Proper etch of enamel
- Proper bond to enamel and dentin
- Creating a tight interproximal contact
- Shrinkage and stress on the materials used
- Post-operative sensitivity
- Placing the composite – increments, layers, bulk?
- Effect of bases and liners on success
- Light energy
- Finishing and polishing
  …and many more!

Stress vectors created during light cured polymerization

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The Importance of Managing Shrinkage Stress

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Polymerization Shrinkage Facts

- Polymerization shrinkage is a volumetric change…all composites shrink!
- It occurs because the monomer molecules form covalent bonds during the polymerization phase, reducing interatomic distances between them.
- The inorganic (solid) fillers do not react this way and maintain a constant volumetric dimension.
Polymerization Stress Facts

- Polymerization stress is a complex interaction of cavity geometry, reaction kinetics, volumetric shrinkage, degree of conversion and elastic properties of the composite.
- Early and initial stresses within the prep and material are offset because there is plenty of monomer liquid available.
- Stresses build up within the composite as the liquid monomer is used up during the polymerization reaction and the material enters the “gel phase”.
- Deflection of cuspal walls, a failure of the adhesive bond, or a cohesive failure (fracture) within the adhesive layer, the restorative material, or the tooth itself are possibilities.

Popular Methods Used to Obtain Proximal Contacts...

- Pre-polymerized inserts
- Pre-wedging of teeth
- Curing light contact pressure instruments
- Special matrices – metal and clear
- Contact-forming instruments
- Packable composites

Layering vs Bulk Fill

- Truly the “$64 Question” for the past 30 years in resin-based composites.
- Many of the original challenges with PCRs have been solved or attenuated, but changing this behavior is the most difficult.

“...To date, the literature has not shown conclusively that incremental layering definitively helps reduce the effects of shrinkage stress versus bulk placement.”

Problem & Solution

Tofflemire v. Sectional Matrices

<table>
<thead>
<tr>
<th>Tofflemire System</th>
<th>Sectional Matrices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fails to restore proximal anatomy</td>
<td>Operator-friendly retaining system</td>
</tr>
<tr>
<td>Thin contact at the marginal ridge</td>
<td>Naturally contoured bands</td>
</tr>
<tr>
<td>Large food trap below</td>
<td>Anatomically correct contacts</td>
</tr>
<tr>
<td>Increased likelihood of fracture, occlusal interference, recurrent caries and periodontal disease</td>
<td>Contacts at the height of contour</td>
</tr>
<tr>
<td>Contacts so tight you’ll need a hemostat to get the band out!</td>
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Consequences of Improper Light Curing

- Insufficient polymerization adversely affects both physical and chemical properties of the restoration*
  - Inflammatory response
  - Lower bond strengths
  - More water sorption
  - Weaker properties
  - Microleakage
  - Sensitivity
  - Recurrent decay

Posterior “Grocery List”

- **Matrix System**
  - V3 Ring (Triodont), Palodent Plus (Dentsply/Caulk), Cure-Thru band (Premier)
- **Dentin Replacement** (if needed)
  - Fuji LC, Fuji Filling LC, TheraCal LC (Bisco)
- **Adhesive**
  - Clearfil Protect Bond (Kuraray), Prime & Bond Elect (Caulk), AdheseUniversal Pen (Ivoclar)
- **Flowable**
  - SureFill SDR Flow+(Caulk) or Heliomolar Flow (Ivoclar)
- **Body Composite**
  - Numerous choices. Single shade if good chameleon effect
- **Light Source**
  - LED such as Bluephase Style (Ivoclar/Vivadent), SmartLight Focus (Dentsply/Caulk), Valo Grand (Ultradent). Minimum 1000 mW
- **Finish and Polish**
  - 12 fluted spiral carbides (Brasseler and Axis)
  - Astropol (Ivoclar), ProGloss (Axis) or Optrapol (Ivoclar), PoGo and Enhance (Caulk)

“Recipe for Success”

Posterior Techniques

**CLASSIC** SEMI-BULK FILL

**CONTEMPORARY** SEMI-BULK FILL

**TOTAL** BULK FILL

“Recipe for Success”

Basic Posterior Technique

- Prep and bevel all enamel cavosurfaces with a 40u diamond
- Isolate prep with appropriate matrix system
- Clean prep with 5% sodium hypochlorite or Consepsis. Rinse and dry.
- With deeper preps or dentinal concerns, place glass ionomer liner as a dentin substitute.
- Use Total-Etch, Self-Etch or Selective-Etch techniques with DBA of choice, remembering to always read and follow the manufacturer’s directions unless otherwise informed.
- Air disperse DBA and cure with visible light source.

“Contemporary” Semi-Bulk Fill

- Syringe an amount of low stress/low strain flowable resin into the proximal box up to height of pulpal floor or a maximum of 4mm.
- Light cure through the tooth with sufficient energy (minimum of 1000 mw/cm²).
- Add additional flowable to prep - do not cure it - then body composite to fill. Shape with instruments and brushes. Cure again through tooth.
- Remove matrix, check occlusion, finish.

“Total” Bulk Fill

- Utilize one of the specially formulated low stress/low shrink body or flowable composites to fill the prep (maximum of 4mm on many of the materials).
- Shape with instruments and brushes prior to curing.
- Light cure through the tooth with sufficient energy (minimum of 1000 mw/cm²).
- Remove matrix, check occlusion, finish.
“Contemporary” Semi-Bulk Fill with Surefil SDR Flow

Remove caries and bevel all enamel margins with a 40 u diamond.

Palodent Plus ring, wedge and matrix in place, use a selective-etch technique.

Apply Prime & Bond Elect Universal bonding agent.

Syringe the Surefil SDR Flow into the prep up to the pulpal floor or 4mm maximum.

After curing the SDR Flow layer, top cap the prep with Spectra TPH A1 (LV).

Cure through-the-tooth with two LED lights for 20 seconds.
After removing the Palodent ring and matrix, initial shaping and contouring is done with 12-fluted, spiral shaped carbides (Axis or Brasseler H48L-010).

Continue occlusal refinement with the 379 carbide.

Final polish is achieved with the Enhance system of cups, points and disks.

The final Class II using SureFil SDR Flow and Spectra TPH.

This is what they are looking for!

Layering of Anterior Composites

- MONOCHROMATIC
  - One shade, medium opacity, small restorations, esthetics not a high priority

- GRADIENT
  - Two shades: Dentin/body shade covered with 0.5mm of enamel shade

- STRATIFIED
  - Three shades and/or may include:
    - Halo, mamelon definition, translucency, maverick lines, flecks, fluorosis, etc...
Chief concern: Doesn't like her "gap" on the end of #10
Direct Uses of Fiber Reinforcement

- Periodontal splinting – long term/short term
- Splinting of injured, loose or traumatized teeth
- Fiber posts in endodontically treated teeth
- Orthodontic retainers
- Reinforcement of large span temporary bridges
- Bonding of a cracked tooth
- Replacement of a missing tooth
  - Using the existing extracted tooth
  - Using a premade tooth (ie denture tooth)
  - Creating your own custom pontic with composite
- Codes: D6548 each retainer  D6245 pontic and write narrative

Fiber Based Systems

- Ribbond (polyethylene)
- Connect/Construct (polyethylene)
- BioSplint (polyethylene)
- Kevlar
- Glasspan (glass)
- DentaPreg (glass)
- GrandTEC (glass)
- everSTICK (glass)
Fundamentals of the FRCB

- Create a pontic using direct composite resin
- Use of fiber reinforcement for improved physical properties and longevity
- Conservative design
- Excellent esthetics
- Expands treatment planning
- Repairable

“Shannon”

USING COMPOSITE TO HELP SOLVE ESTHETIC DILEMMAS
“Have a plan…”
“Work as a team…”

LOOK OUTSIDE THE BOX!
This is what they are looking for!

THANKS!
Email me at ddssmile@aol.com for the complete slide deck