

Direct Dental Composite Filling for Posterior Teeth

Part II

1-Tooth/Cavity Preparation

Follow usual procedures for tooth or cavity preparation.

a. Minimize cavity prep. as much as possible (important for Class I & II restorations).

b. Isthmus width should be narrow.

c. Do not include no carious fissures in preparation.

d-Exposed deep dentine must be protected by:

Calcium hydroxide preparation.

Glass Ionomer cement can also be used.

Otherwise, no liner is required.

e-Problems with subgingival cavities.

Cervically, microleakage from :

Enamel Thickness

Stress from curing shrinkage.?

Reduced bond strength to dentin or cementum.?

The stresses of thermocycling.

Cavity preparation design

Location of margin

Location of restoration

Size of restoration

CASE SELECTION

OCCLUSION CONCERNS/ANTAGONISTIC CUSP:

Greatly affects the degradation of composite.

Increased localized wear with increased surface

Bulk fracture and marginal deterioration.

ANTAGONISTIC CUSP:

PRE-OP: Use articulating paper

DESIGN out line form to avoid contact area.

MODIFY the opposing cusp to redirect the contact area away from restoration.

ENAMELOPLASTY of opposing cusp to flatten the occlusal load over a wider area.

CLINICAL TECHNIQUE

ISOLATION RECOMMENDATIONS

Rubber Dam Isolation is Mandatory: Failure to maintain a dry field will result in clinical failure. Prevention of moisture contamination and protection of gingival tissues is of paramount importance.

Select shade before rubber dam application. Dentin shade up to the DEJ level.

Incisal or enamel shade for final increment.

PRE-WEDGING

Gains interproximal separation to facilitate tight contact area.

Cure through reflective wedges: reflect 90% of light at a 90 degree angle toward the proximal surface. lateral reflecting wedges were superior to transparent non-reflecting wedges in inducing superior margins.

Cavity preparation

Adhesive preparation for posterior composites differs from traditional amalgam preparations in many ways. Preparation is shallower.

retention is provided through bonding.

preparation is narrower:

less occlusal contact area. Reduces wear. Decreases affect of polymerization shrinkage. Improved marginal integrity. Less cuspal deflection. Preparation has rounded internal line angles: Conserves tooth structure. Decreases stress concentration. Enhances resin adaptation during placement. No extension for prevention: Occlusal surface is invaded only if caries dictates it.

No increased resistance to fracture by including the occlusal surface in the prep versus a slot preparation. Treat adjacent pits and fissures with sealants. proximal box preparation concerns

Slot preparations: mechanical retention isn't important. don't extend the preparation beyond the marginal ridge by more than 2 mm.

Gingival margin concerns, slot preparation or conventional class ii prep:
Gingival floor extended only to depth of carious lesion.
Conserve enamel for bonding and microleakage prevention. occlusal margin of preparation
Beveled occlusal cavosurface margin: Significantly increases the wear rate compared to conventional butt joint cavosurface margins.
why? the bu-li dimension is increased and influences the affect of the antagonistic cusp.
does prep design make a difference?
The Strength of Class II Composite Resin Restorations as Affected by Preparation Design.
What load was required at the marginal ridge to produce failure in composite designs with these differing prep designs?

DOES INTRAORAL LOCATION MAKE A DIFFERENCE?

Composites wear more rapidly on molars than they do on premolars or anterior teeth regardless of composite type.
The larger the BU-LI width, the greater the amount of wear.
Consider other restorative materials in molar situations.

2-SELECTION OF MATERIAL

Restorative material options
Hybrid resin.
Microfill resin
Hybrid resin internal & microfill resin on outer 1 mm.
Packable resin
Packable resin with microfill on outer 1 mm.
Nanofilled composite.

Microhybrids:

Excellent physical properties.
Good finishing and polishing characteristics
Relatively non-sticky materials
Do not hold a high polish over time

Restorative Procedures for Pack able Resin Composites

- 1- Cavity prep. As mentioned.
2. Restorative process:
 - a. Acid etch entire surface of preparation/rinse.

- b. Can use ultra weight Tofflemire matrix.
- c. Inject flowable resin composite over internal aspect of preparation to a thickness of 0.5-1.0mm. This is helpful if the particular packable resin composite being used is so highly filled that it does not possess adequate wetting.
- d. Transfer material into preparation using: A composite instrument. or an amalgam carrier.
Can condense material to maximize flow and adaptation using:
The broad surface of any instrument. Use amalgam condenser with unserrated ends.
Incremental curing (<2.0mm) safer to reduce stress on enamel walls and possibly reduce polymerization shrinkage.
- g. Slightly over beyond cavosurface margin & use burnisher to create occlusal anatomy.

1. Packable resin composites are designed to provide non-sticky, packable behavior during manipulation similar to dental amalgam.

- 2. If these materials are to be a substitute for amalgam, they should strengthen teeth, promote minimal cusp flexure, and exhibit less occlusal & opposing tooth wear.

- 3-SHADE SELECTION

color analysis and color blending
care during selection about:

- RESTORATIVE DEFECTS

- Divided into two major categories including :
 - 1-have no tooth structure background .
 - 2-have a tooth structure background.

- 4-COMplete ISOLATION

- Prewedging . Performed early before cavity preparation.
- Obtain proper contact area, i.e Separation of teeth.

- 5-Etch Surfaces

- Apply etchant to surface of teeth for 15seconds. using : disposable (brush or needle) or cotton pellet.
- On primary teeth and highly mineralized teeth.

The inorganic component, hydroxyapatite, varies from 86% to 98% . Depending on the age of the enamel. Application of 37% phosphoric acid Removes about 10 microns of enamel to expose prisms of enamel rods and create the classic honeycomb effect. Acid also increases surface energy. Etching is most effective when the acid is activated by movement. Good enamel etching will : De-mineralize the prism core and inter-prismatic substance and leave the enamel prisms intact.

While in dentin will de-mineralize the peri and intertubular dentin

Precautions and Warnings

Use gel and not a liquid.

Has a different color of the etched tooth.

Avoid contact of with soft tissue .

Wash immediately if accidental spill occurs.

Wetting with Low Viscosity Resin , HEMA-rich, Coats irregularities Polymerized for 20 seconds, Creates “resin tags” Strong mechanical interlock, Smear Layer, Preparation debris, Thin (< 5 μm), Irregularly arranged, Sticky but chemically removable, Penetrates tubules (Smear Plugs)

Etching of Dentin

Removes or restructures smear layer, Dissolves inorganic component of dentin, Exposes and denatures collagen.

Dentin primer, Hydrates collagen, Wetting with Low Viscosity Resin, Low viscosity resin, HEMA-rich, Surrounds collagen, Polymerized for 20 seconds, Strong mechanical interlock , Forming a “hybrid layer”

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