Class I, II, and VI Direct Composite Restorations and Other Tooth-Colored Restorations

The American Dental Association (ADA) indicates the appropriateness of composites for use as pit-and-fissure sealants, preventive resin restorations, and Class I and II restorations for initial and moderate-sized lesions, using modified conservative tooth preparations. When used correctly in the primary and permanent dentition, the expected lifetime of resin-based composites can be comparable to that of amalgam in Class I, Class II, and Class V restorations. The longevity of posterior composites, however, is directly related to factors such as the size of the restoration, the patient's caries risk, and operator technique.

Composite is a material that has sufficient strength for Class I and II restorations. It is insulative and, in most cases, does not require pulpal protection with bases. Because composite is bonded to enamel and dentin, tooth preparations for composite can be very conservative. A composite restoration not only is retained well in the tooth, but also can strengthen the remaining unprepared tooth structure.

Indications

Class I, II, and VI direct composite restorations are indicated for the restoration of -primary small to moderate caries lesions in the occlusal (Class I and VI) and proximal (Class II) surfaces of posterior teeth.

-Indicated when esthetics is considered to be of primary importance.

-They also are indicated occasionally as large restorations that may serve as foundations for crowns.

-In selected cases, large composite restorations may be used where an interim restoration is indicated .

Contraindications

-Main contraindication for use of composite for Class I, II, and VI restorations is an operating area that cannot be adequately isolated.

-When heavy occlusal stresses are present

Advantages

The advantages of composite as a Class I and II direct restorative material relative to other restorative materials are:

1. Esthetics
2. Conservative tooth structure removal
3. Easier, less complex tooth preparation
4. Insulation
5. Decreased microleakage
6. Increased short-term strength of remaining tooth structure

Disadvantages

The disadvantages of Class I and II direct composite restorations are as follows:

1. Polymerization shrinkage effects
2. Lower fracture toughness than most indirect restorations
3. More technique-sensitive than amalgam restorations and some indirect restorations
4. Possible greater localized occlusal wear
5. Unknown biocompatibility of some components

Pits n fissure sealants

pit-and-fissure sealants provide a safe and effective method of preventing caries.In children, sealants are most effective when they are applied to the pits and fissures of permanent posterior teeth immediately on eruption of the clinical crowns, provided proper isolation can be achieved.

Adults also can benefit from the use of sealants if the individual experiences
an increase in caries susceptibility because of a change in diet, lack of adequate saliva, or a particular medical condition.

Most currently used sealant materials are light-activated urethane dimethacrylate or BIS-GMA (bisphenol A–glycidyl methacrylate) resins

Indications

Sealants are indicated, regardless of the patient's age, for either preventive or therapeutic uses, depending on the patient's caries risk, tooth morphology, or presence of incipient enamel caries.

The decision of when to go for pits n fissure sealants is based primarily on radiographic and clinical examinations.

If the examination reveals chalkiness or softening of the tooth structure at the base or walls of the pit or groove, brown-gray discoloration radiating peripherally from the pit or groove, or radiolucency beneath the enamel surface on the radiograph, it is likely that an active caries lesion is present and a sealant may not be indicated.

When no cavitated caries lesion is diagnosed, the treatment decision is either to pursue no treatment or to place a pit-and-fissure sealant, particularly if the surface is at high risk for future caries.

Only caries-free pits and fissures or incipient lesions in enamel not extending to the dentino-enamel junction (DEJ) currently are recommended for treatment with pit-and-fissure sealants.

Clinical Technique

Because materials and techniques vary, it is important to follow the manufacturer's instructions for the sealant material being used.

The tooth is isolated by using a rubber dam or cotton rolls.

Isolation of the area is crucial to the success of the sealant. Sealant placement in younger patients is more common, and since molar teeth are often not fully
erupted in these patients, isolation can be difficult.

The area is cleaned with a slurry of pumice on a bristle brush.

The tooth surface is dried, and etched with 35% to 40% phosphoric acid for 15 to 30 seconds. Properly acid-etched enamel surface has a lightly frosted appearance. Any brown stains that originally may have been in the pits and fissures should be allowed to remain. The sealant material is then applied with an applicator or small hand instrument. The sealant is gently teased into place, to avoid entrapping air, and it should overfill slightly all pits and fissures, but it should not extend onto unetched surfaces. Remove excess sealant if any. After light-activation and removal of the rubber dam, the occlusion is evaluated by using articulating paper. If necessary, a round carbide finishing bur or white stone is used to remove any excess sealant. The surface usually does not require further polishing.

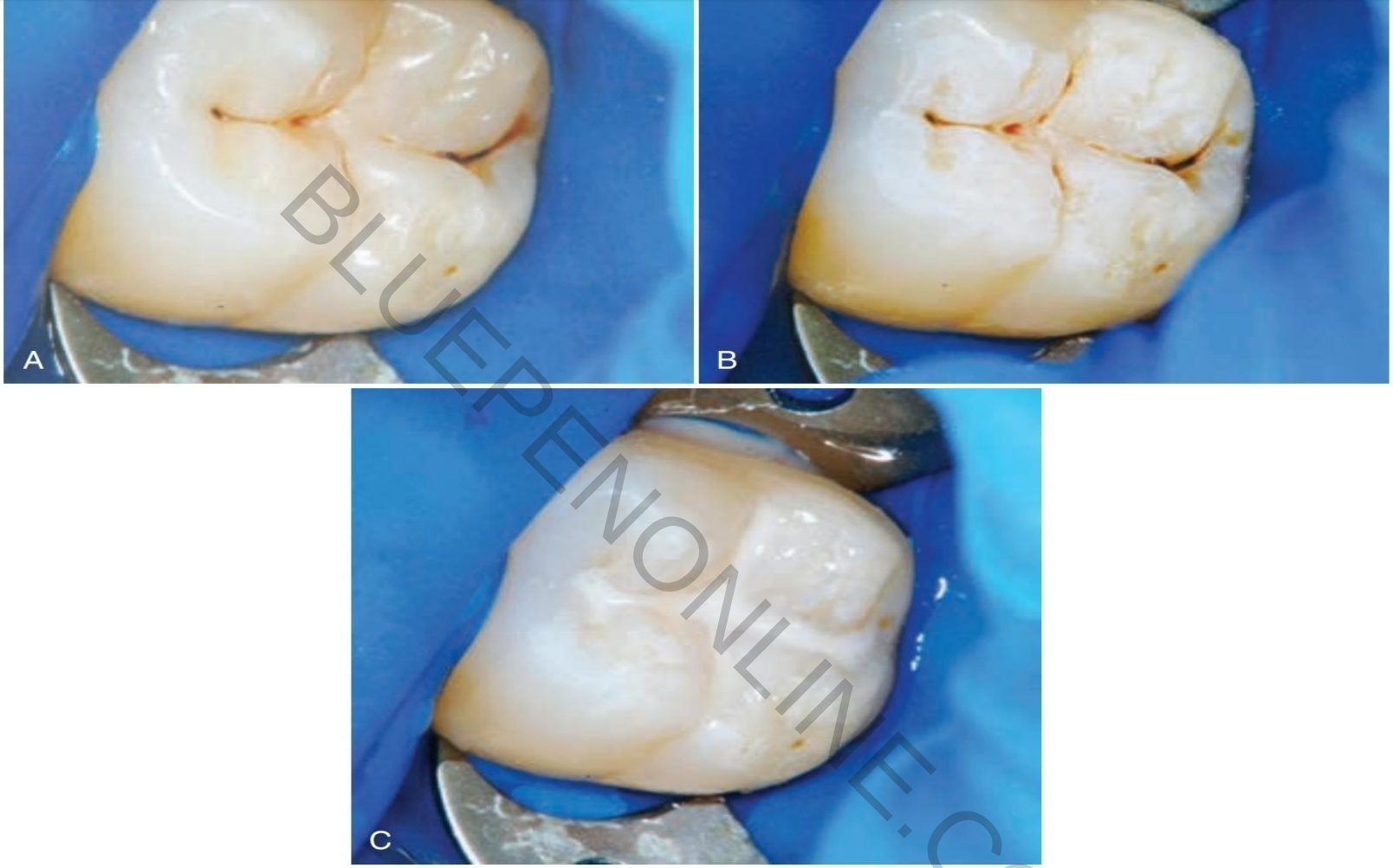

Fig.10-2 Steps in application of pit-and-fissure sealant. **A,** After isolation and thorough cleaning of the occlusal surface to be sealed. **B,** After acid-etching, rinsing, and drying. **C,** With sealant applied.

Preventive Resin and Conservative Composite Restorations

When restoring minimally carious pits and fissures on an unrestored tooth, an ultraconservative preparation design is indicated. This design allows for restoration of the lesion or defect with minimal removal of the tooth structure and often may be combined with the use of flowable composite or sealant to seal radiating non-carious fissures or pits that are at high risk for subsequent caries activity . Earlier referred to as a preventive resin restoration, this type of ultra-conservative restoration is now termed conservative composite restoration.

The crucial factor in clinical assessment is whether or not the suspicious pit or fissure has active caries that requires restorative intervention.

In case of suspicious carious lesions, the tooth preparation is deepened, an assessment is made in the suspicious areas to determine whether or not to continue the preparation toward the DEJ . If the suspicious fault/ caries is removed and found to be at a sound shallow preparation depth (minimal dentin caries), the conservative exploratory preparation and adjacent pits and fissures are etched with 35% to 40% phos-phoric acid for 15 to 30 seconds, rinsed and lightly dried. The etched surfaces then are treated with an adhesive, which is placed and light-activated, according to manufacturer’s instructions.

Conservatively prepared area can then be restored with a flowable composite, which is placed and light-activated, according to manufacturer's instructions. The adjacent etched pits and fissures, if judged to be at risk, can then be sealed using a pit-and-fissure sealant or the same flowable composite .

If the suspicious area is found to be carious, the preparation depth is extended until all of the caries is removed, and the prepared area is then restored with composite.

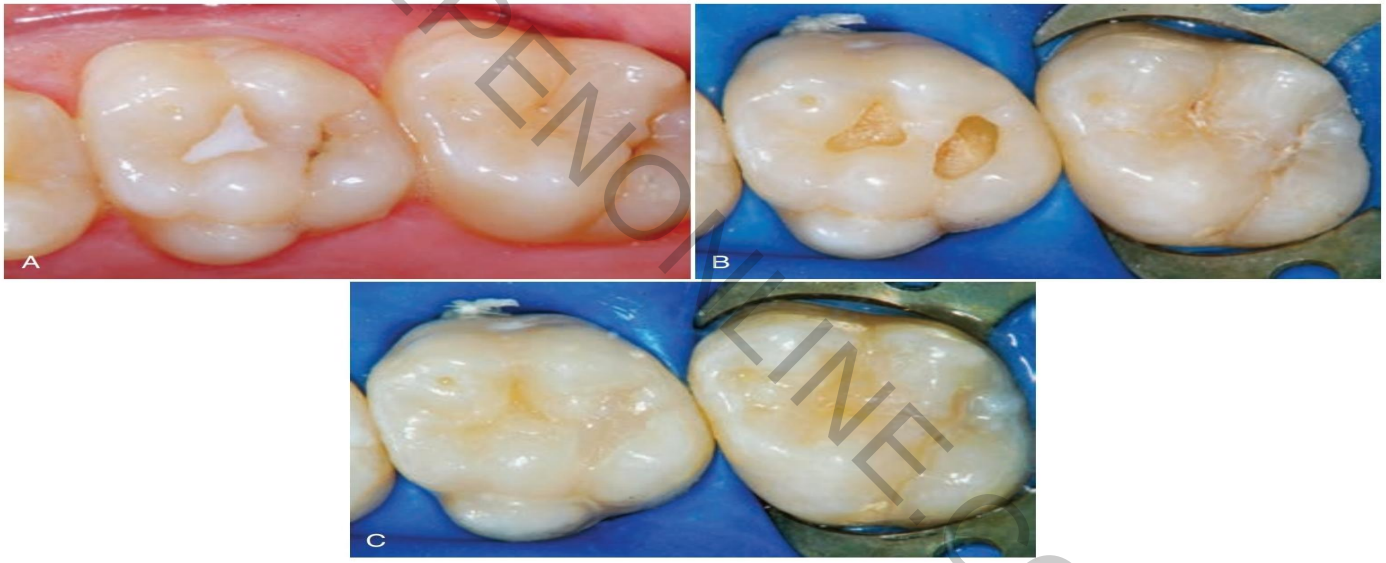

Fig. 10-3 Conservative composite restoration. **A,** Occlusal view of the maxillary first and second molars. The first molar has caries on the distal occlusal pit, and the second molar has suspicious pit on the disto-occlusal aspect. **B,** Caries was excavated from the first molar, and the second molar was minimally prepared. **C,** The first molar was restored with composite, and the second molar received a conservative composite restoration with flowable composite.

Clinical Technique for Class VI Direct Composite Restorations

One of the most conservative indications for a directly placed posterior composite is a small faulty developmental pit located
on a cusp tip. The typical Class VI tooth preparation should be as small in diameter and as shallow in depth as possible. The faulty pit is entered with
an appropriate round bur or diamond oriented perpendicular to the surface and extended pulpally to eliminate the lesion.Stains that appear through the translucent enamel should be removed; otherwise, they may be seen after the composite restoration is completed. Some undermined, but not friable, enamel may be left and bonded to the composite.

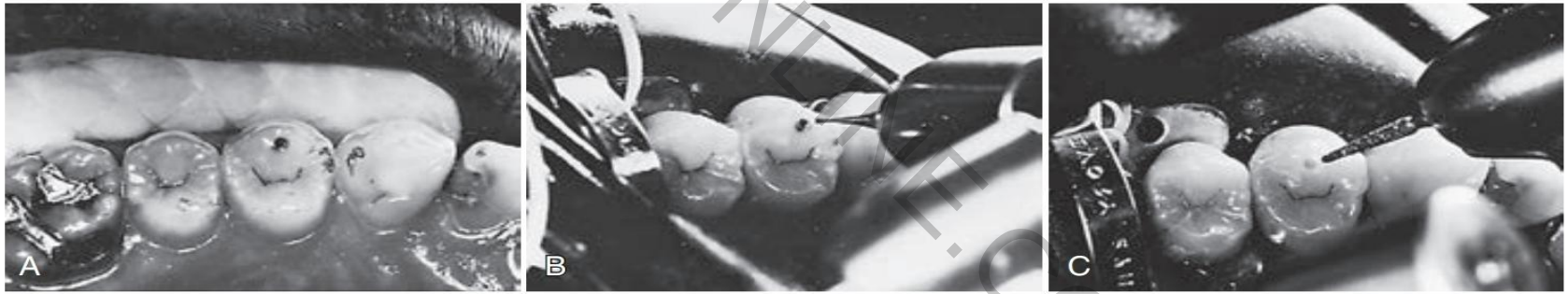

Fig. 10-7 Class VI tooth preparation for composite restoration. **A,** Class VI preparation on the facial cusp tip of the maxillary premolar. **B,** Entry w small round bur or diamond. **C,** Preparation roughened with diamond, if necessary.

Clinical Technique for Class I Direct Composit Restorations

Initial Clinical Procedures

The general procedures regarding anesthesia, shade selection, occlusal relationship, and isolation of the operating field are necessary before beginning a Class I composite restoration.

Tooth Preparation

As a general rule, similar to the tooth preparation for direct anterior restorations, the tooth preparation for direct poste-rior composites involves

(1) creating access to the faulty structure,

(2) removal of faulty structures (caries, defective restoration and base material) (3) creatingconvenience form for the restoration.

Retention is obtained by bonding. When placing most posterior composites, it is not necessary to incorporate mechanical retention features in the tooth preparation.

Small to moderate Class I direct composite restorations :

Small to moderate Class I direct composite restorations may use minimally invasive tooth preparations and do not require typical resistance and retention form features. Instead, these conservative preparations typically use more flared cavosurface forms without uniform or flat pulpal or axial wall. A scooped-out
appearance is achieved with a small round or elongated pear diamond or bur with round features. The initial pulpal depth is approximately 0.2 mm inside the DEJ but may not be uniform (i.e., the pulpal floor is not flat throughout its
length). More rounded, and smaller cutting instrument is used for this preparation, in an attempt to be as conservative as possible in the removal of the tooth structure.

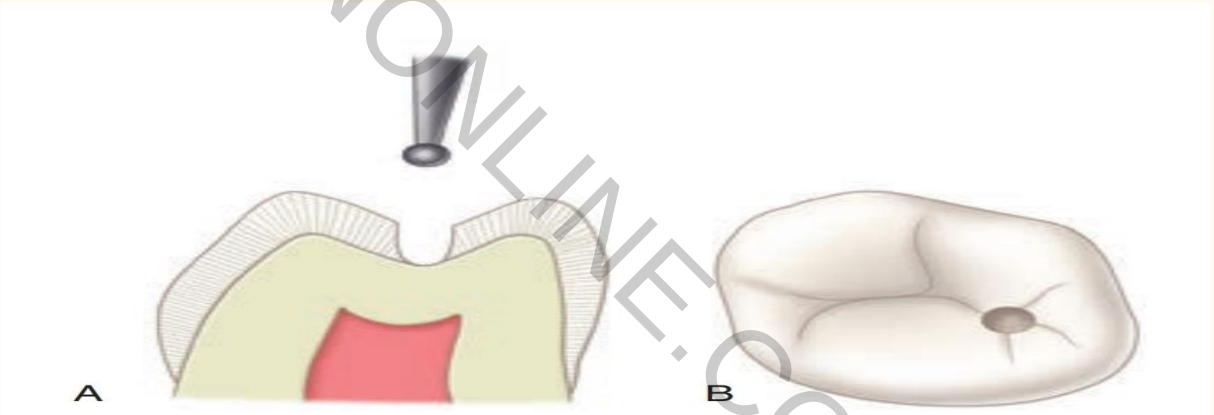

Fig. 10-8 Faciolingual cross-section of small Class I tooth preparation using round diamond.

Moderate to Large Class I Direct Composite Restorations

Moderate to large Class I direct composite restorations, especially when used for larger caries lesions or to replace existing defective amalgam restorations, will flat walls that are perpendicular to occlusal forces, as well as strong tooth and restoration marginal configurations. All of these features help resist potential fracture in less conservative tooth preparations.

The objective of the tooth preparation is to remove all of the caries or fault as conservatively as possible. Because the composite is bonded to the tooth structure, other less involved, or at-risk, areas can be sealed as part of the conservative preparation techniques. Sealants may be combined with the Class I composite restorations.

In large composite restorations, the tooth is entered in the area most affected by caries, with the elongated pearl diamond or bur positioned parallel to the long axis of the crown. When it is anticipated that the entire mesiodistal length of a central groove will be prepared, enter the distal portion first and then transverse mesially. This technique permits better vision to the operator during preparation. The pulpal floor is prepared to an initial depth that is approximately 0.2 mm internal to the DEJ. The instrument is moved mesially, following the central groove. Mesial, distal, facial, and lingual extensions are dictated by the caries, old restorative material, or defect, always using the DEJ as a reference for both extensions and pulpal depth. The cuspal and marginal ridge areas should be preserved as much as possible.

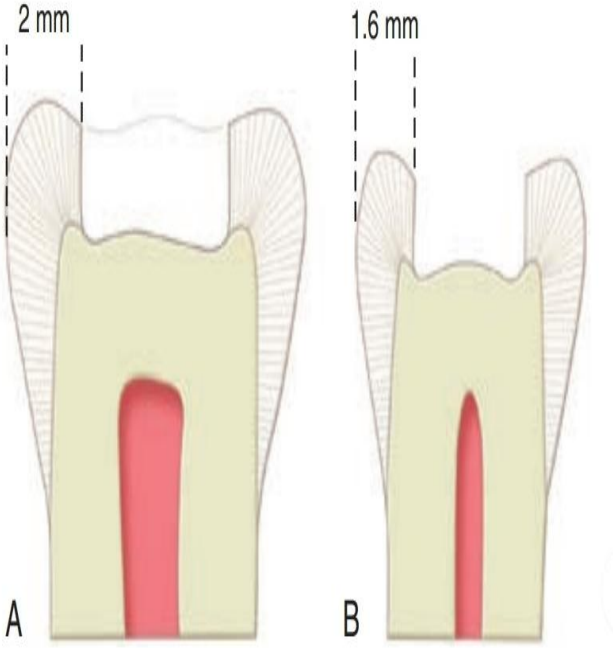

Fig. 10-10 Mesiodistal extension. Preserve dentin support of marginal ridge enamel. **A,** Molar. **B,** Premolar.

After extending the outline form to sound tooth structure, if any caries or old restorative material remains on the pulpal floor, it should be removed with the appropriately-sized round bur or hand instrument. The occlusal margin is left as prepared. No attempt is made to place additional beveling on the occlusal margin because it may result in thin composite in areas of heavy occlusal contact.

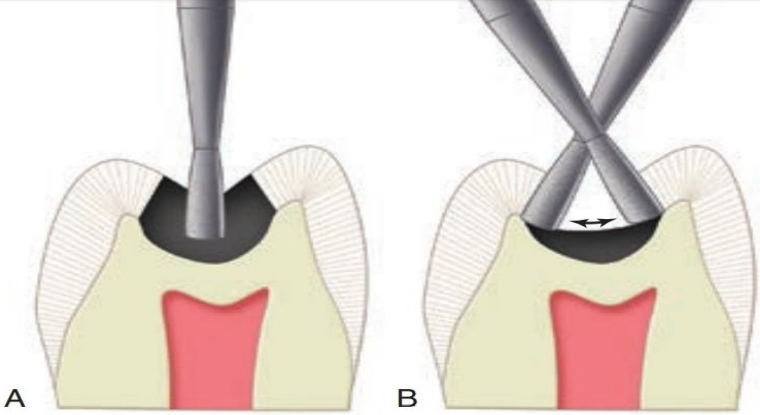

Fig. 10-11 **A,** After initial entry cut at correct initial depth (1.5 mm), the caries remains facially and lingually. **B,** Orientation of diamond or bur must be tilted as the instrument is extended facially or lingually to maintain a 1.5-mm depth.

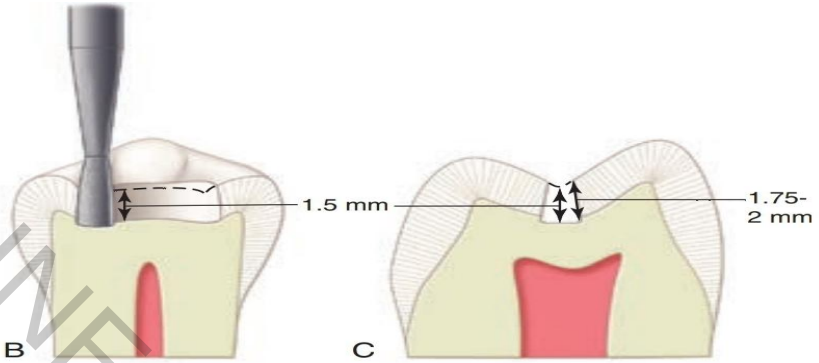

Fig. 10-9 **A,** Entry cut. Diamond or bur held parallel to the long axis of the crown. Initial pulpal depth is 1.5 mm from the central groove. When the central groove is removed, facial and lingual wall measurements usually are greater than 1.5 mm. (The steeper the wall, the greater is the height.) **B,** 1.5-mm depth from the central groove. **C,** Approximately 1.75- to 2-mm facial or lingual wall heights.

Restorative Technique

Placement of the Adhesive

The bonding agent is applied to the entire preparation with a microbrush, in accordance with the manufacturer's instructions. After application, the adhesive is polymerized with a light-activation unit, as recommended by the manufacturer.

When the final tooth preparation is judged to be near the pulp in vital teeth, a base material is used prior to placing the adhesive and the composite. If the remaining dentin thickness is between 0.5 and 1.5 mm, a resin-modified glass ionomer (RMGI) base is used; if the RDT is less than 0.5 mm, a calcium hydroxide liner should be applied to the deepest aspect of the preparation, then protected with an RMGI base prior to adhesive placement.

Insertion and Light-Activation of the Composite

A matrix is usually not necessary for Class I direct composite restorations.

Composite insertion hand instruments or a compule may be used to insert the composite material. It is important to place (and light-activate) the composite incrementally to maximize the polymerization depth of cure and possibly to reduce the negative effects of polymerization shrinkage.This may also reduce the negative C-factor effects for Class I composite restorations.

When composite is placed over an RMGI material used as a base, this technique is often referred to as a **“sandwich” technique**. The potential advantages of this technique are :
(1) the RMGI material bonds to the dentin without opening the dentinal tubules, reducing the potential for post-operative sensitivity
(2) the RMGI material, because of its bond to dentin and potential for fluoride release provides a better seal when used in cases where the preparation extends gingivally onto root structure and
(3) the favorable elastic modulus of the RMGI reduces the effects of polymerization shrinkage stresses.
When it is necessary to extend a composite restoration onto the root surface, the use of an RMGI liner beneath the portion of the restoration on the root surface may decrease microleakage, gap formation, and recurrent caries. In those circumstances, the use of an RMGI material is a valid option.
Likewise, the use of an RMGI, flowable composite, filled dentin adhesive, coupled with the incremental insertion and curing of the composite may offset the negative effects of a high C-factor for Class I composite restorations.

Very deep portions of the tooth preparation are restored first, with increments of no more than 2 mm in thickness . The “enamel layer” of the restoration, that is, the occlusal 1.5-3 mm, should be placed using an anatomic layering technique. The operator places and shapes the composite before it is light-activated so that
the composite restores the occlusal anatomy of the tooth.
Typically, the operator places and light-activates one increment per cusp at a time and continues to place subsequent increments until the preparation is filled and the occlusal anatomy is fully developed . The uncured composite can be shaped against the unprepared cusp inclines, which will result in a very natural anatomic
contour. This will minimizes the need for contouring and finishing after the composite is polymerized. Furthermore, this technique prevents damage to the restoration margins because it minimizes the need to use rotary instruments to remove excess composite in those margins.
When contouring n occlusion adjustments are necessary, occlusal
surface is shaped with a round or oval carbide finishing bur or similarly shaped finishing diamonds. Finishing is accomplished with appropriate polishing cups, points, or both after the occlusion is adjusted as necessary .

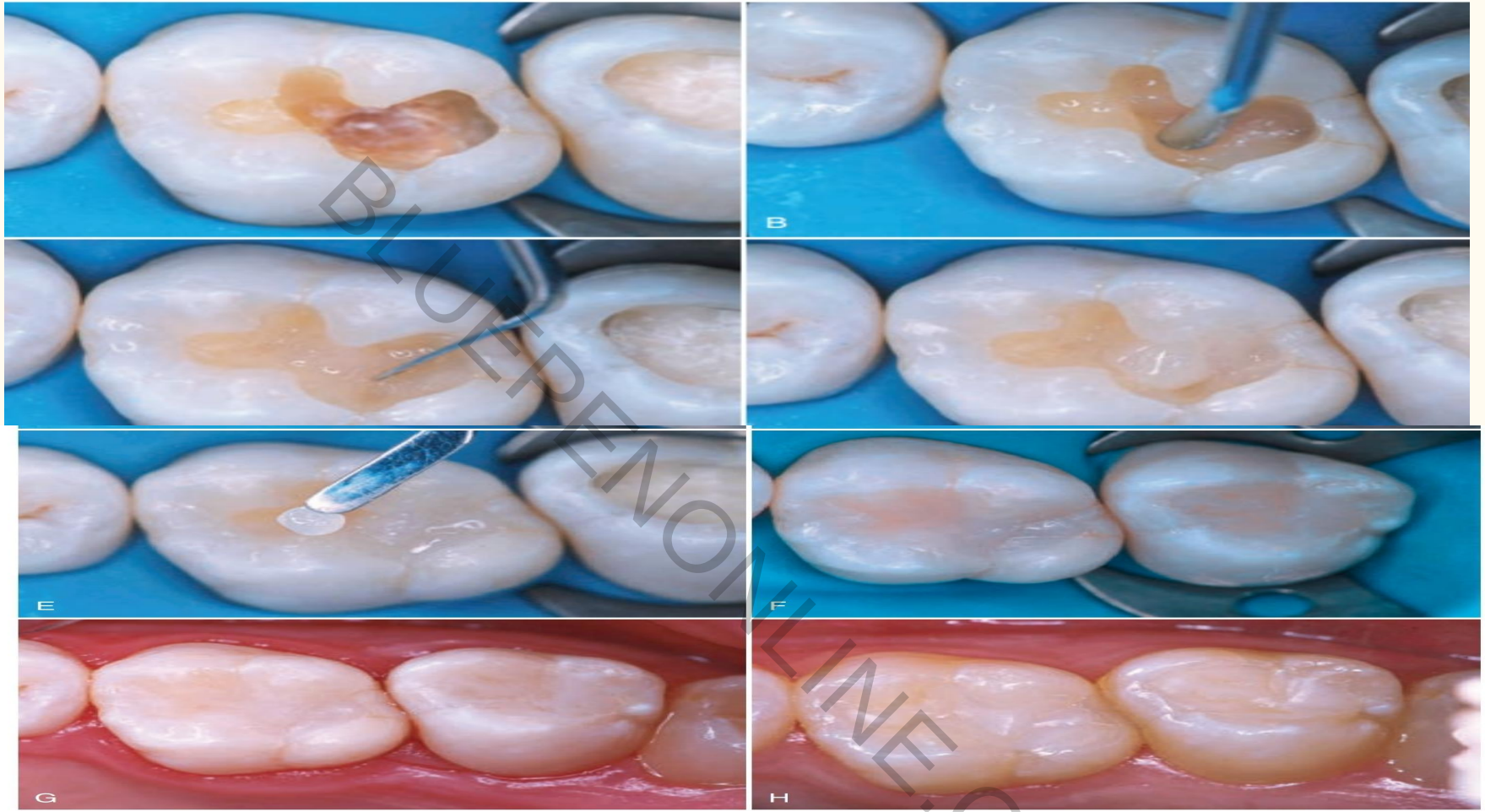

Fig. 10-13 Class I composite incremental insertion. **A,** Tooth preparation for Class I direct composite restoration. **B,** After a resin-modified glass ionomer base is placed, the first composite increment is inserted and light-activated. **C–F,** Composite is inserted and light-activated incrementally, using cusp inclines as anatomic references to sculpt the composite before light-activation. **G,** Completed restorations. **H,** At 5-year follow-up.

Clinical Technique for Class II Direct Composite Restorations

Initial Clinical Procedures

The same general procedures as described previously are necessary before beginning a Class II composite restoration.

Tooth Preparation

Similar to the tooth preparation for Class I direct composite restorations, the tooth preparation for Class II direct composites involves
(1) creating access to the faulty structure,
(2) removal of faulty structures (caries, defective restoration and base material) (3) creating the convenience form for the restoration.
Retention, as with Class I restorations, is obtained by bonding, so it is not necessary to use mechanical retention features in the tooth preparation of Class II composite restorations.

Small Class II Direct Composite Restorations

Small Class II direct composite restorations are often used for primary caries lesions, that is, initial restorations. A small round or elongated pearl diamond or bur with round features may be used for this preparation to scoop out the carious or faulty material from the occlusal and proximal surfaces. The
pulpal and axial depths are dictated only by the depth of the lesion and are not uniform. The proximal extensions likewise are dictated only by the extent of the lesion.

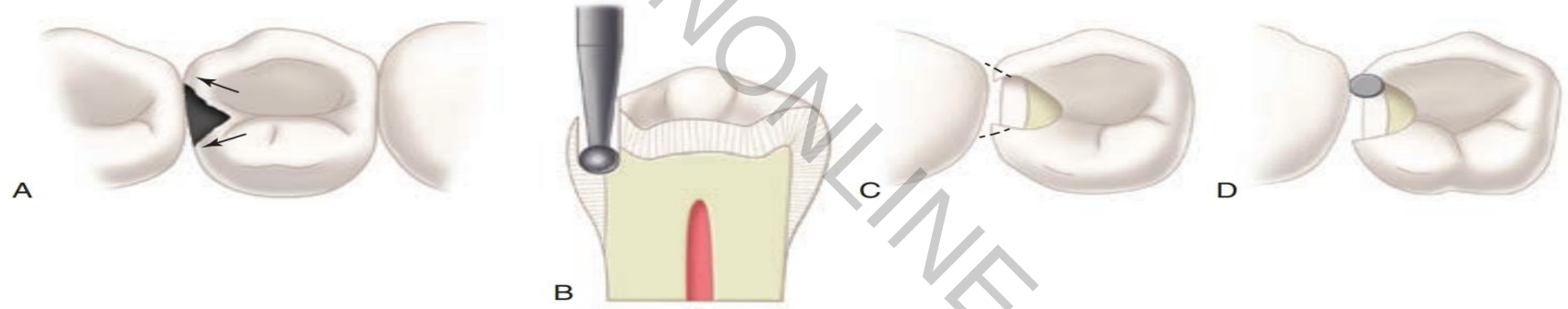

Fig. 10-15 Class II direct composite tooth preparation. **A,** Pre-operative visualization of faciolingual proximal box extensions. Arrows indicate desired extensions. **B,** Round or oval, small elongated pearl instrument used. **C** and **D,** Facial, lingual, and gingival margins may need undermined cavosurface enamel (indicated by dotted lines) removed with straight-sided thin and flat-tipped rotary instrument or hand instrument.

Another conservative design for small Class II composites
is the box-only tooth preparation. This design is indicated when only the proximal surface is defective, with no lesions on the occlusal surface. A proximal box is prepared with a small elongated pear or round instrument, held parallel
to the long axis of the tooth crown. The instrument is extended through the marginal ridge in a gingival direction. The axial depth is dictated by the extent of the caries lesion or fault. The form of the box depends on which instrument shape is used the more box-like with the elongated pear and the more scooped with the round. The facial, lingual, and gingival extensions are dictated by the defect or caries. No beveling or secondary retention is indicated.

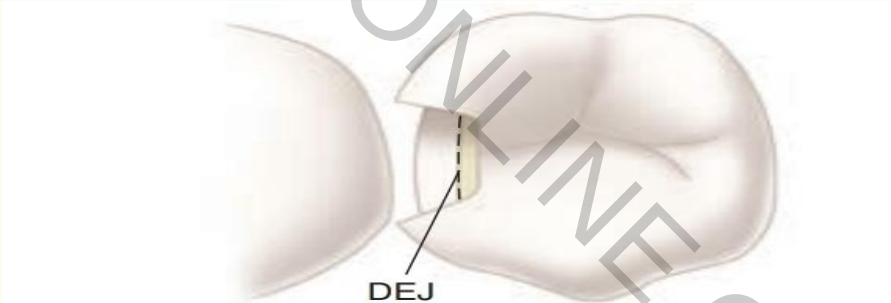

Fig. 10-16 Box-only Class II composite preparation.

A third conservative design for restoring proximal lesions on posterior teeth is the facial or lingual slot preparation .Here, a lesion is detected on the proximal surface, but the operator believes that access to the lesion can be obtained
from either a facial direction or a lingual direction, rather than through the marginal ridge in a gingival direction. Usually, a small round diamond or bur is used to gain access to the lesion. The instrument is oriented at the correct occluso-
gingival position, and the entry is made with the instrument as close to the adjacent tooth as possible, preserving as much of the facial or lingual surface as possible. Care should be taken not to undermine the marginal ridge during the preparation.

Fig.10-17 Facial or lingual slot preparation. **A,** Cervical caries on the proximal surface. **B,** The round diamond or bur enters the tooth from the accessible embrasure, oriented to the occlusogingival middle of the lesion. **C,** Slot preparation.

Moderate to Large Class II Direct Composite Restorations

The tooth preparation for moderate to large Class II direct composite restorations has features that resemble a more traditional Class II amalgam tooth preparation and include an occlusal step and a proximal box.

OCCLUSAL STEP

Preoperatively, the proposed facial and
lingual proximal extensions should be visualized . Initial occlusal extension toward the involved proximal surface should go through the marginal ridge area at initial pulpal floor depth, exposing the DEJ. The DEJ serves as a guide for preparing the proximal box portion of the preparation.
A No. 330 or No. 245 shaped diamond or bur is used to enter the pit next to the carious proximal surface. The instrument is positioned parallel with the long axis of the tooth crown.The pulpal floor is prepared with the instrument to a depth
that is approximately 0.2 mm inside the DEJ. The instrument is moved to include caries and all defects facially or lingually or both, as it transverses the central groove.

Keep the faciolingual width of the preparation as narrow as possible. Care is taken to preserve cuspal areas as much as possible during extensions.

At the same time, the instrument extends through the marginal ridge to within 0.5 mm of the outer contour of the marginal ridge. This extension exposes the proximal DEJ and protects the adjacent tooth . At this time, the occlusal

portion of the preparation is complete except for possible additional pulpal floor caries excavation.The occlusal walls converge occlusally because of the inverted shape of the instrument used.

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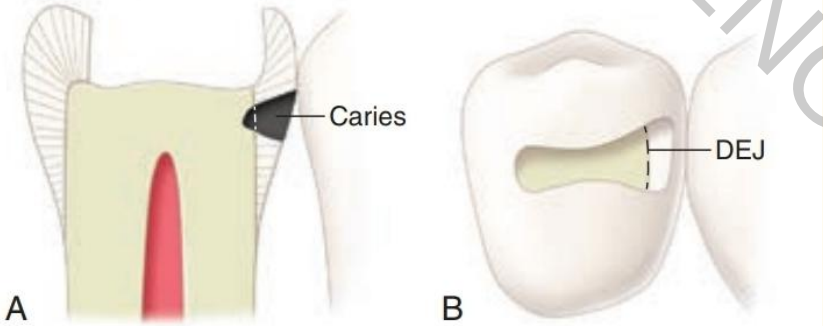


Fig.10-19 Occlusal extension into faulty proximal surface. **A** and **B,** Extension exposes the dentinoenamel junction (DEJ) but does not hit the adjacent tooth. Facial and lingual extensions as preoperatively visualized (see Fig. 10-9 for initial pulpal floor depth).

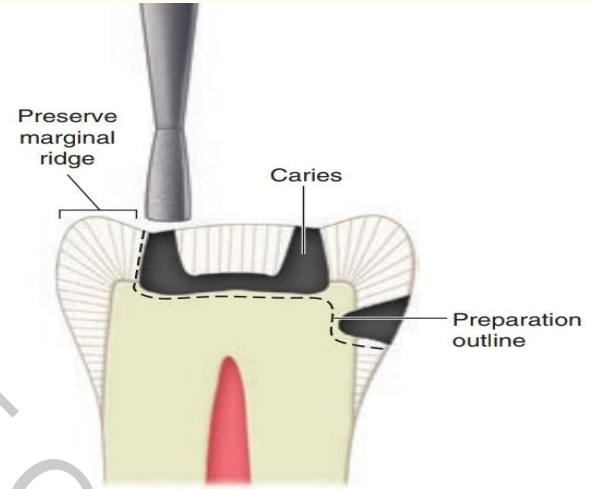


Fig. 10-18 When only one proximal surfaces is affected, the opposite marginal ridge should be maintained.

The extent of the caries lesion and amount of old restorative material are two factors that dictate the facial, lingual, and gingival extensions of the proximal box of the preparation. It is not required to extend the proximal box beyond contact with the adjacent tooth .

Before the instrument is extended through the marginal ridge, the proximal ditch cut is initiated. The operator holds the instrument over the DEJ with the tip of the instrument positioned to create a gingivally directed cut that is 0.2 mm inside the DEJ .The instrument is extended facially, lingually, and gingivally to include all of the caries or old material, or both.The faciolingual cutting is usually in a slightly convex arc outward .The instrument is held parallel to the long axis of the tooth crown. The facial and lingual margins are extended as necessary and should result in at least a 90-degree margin, more obtuse being acceptable as well.

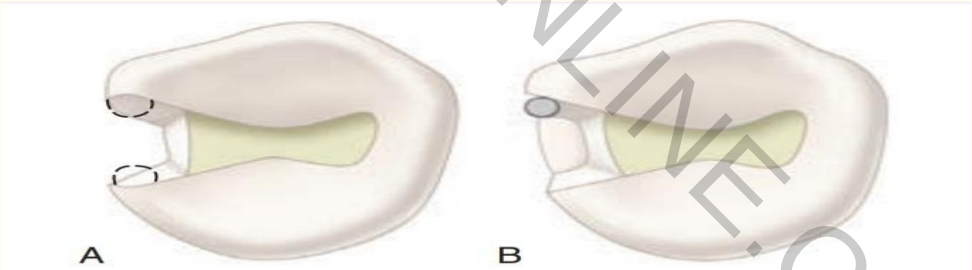
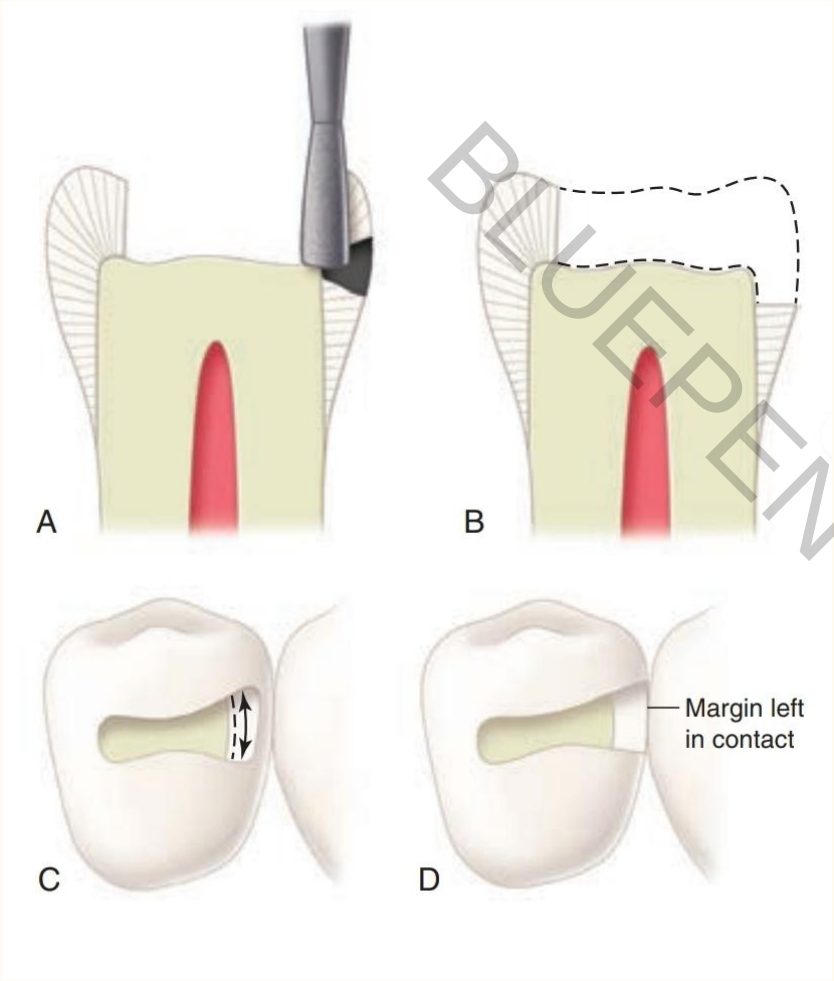


Fig. 10-21 Using a smaller instrument to prepare the cavosurface margin areas of facial and lingual proximal walls. **A,** Facial and lingual proximal margins undermined. **B,** Using a smaller instrument.

The gingival floor is prepared flat with an approximately 90-degree cavosurface margin. Gingival extension should be as minimal as possible, in an attempt to maintain an enamel margin. The axial wall should be 0.2 mm inside the DEJ and have a slight outward convexity. No bevels are placed on the occlusal
cavosurface margins because these walls already have exposed
enamel rod ends because of the enamel rod direction in this
area. A bevel placed on an occlusal margin may result in thin composite on the occlusal surface in areas of potentially heavy contact. This could result in fracture or wear of the composite in these areas. Beveled composite margins also
may be more difficult to finish. If necessary, a round bur or appropriate spoon excavator is used to remove any remaining caries.
After the operator cleans the teeth, administers local anesthetic, selects the shade of composite, and isolates the area, a wedge is placed in the gingival embrasure.
Early wedging helps in the separation of teeth, to compensate later for the thickness of the matrix band.



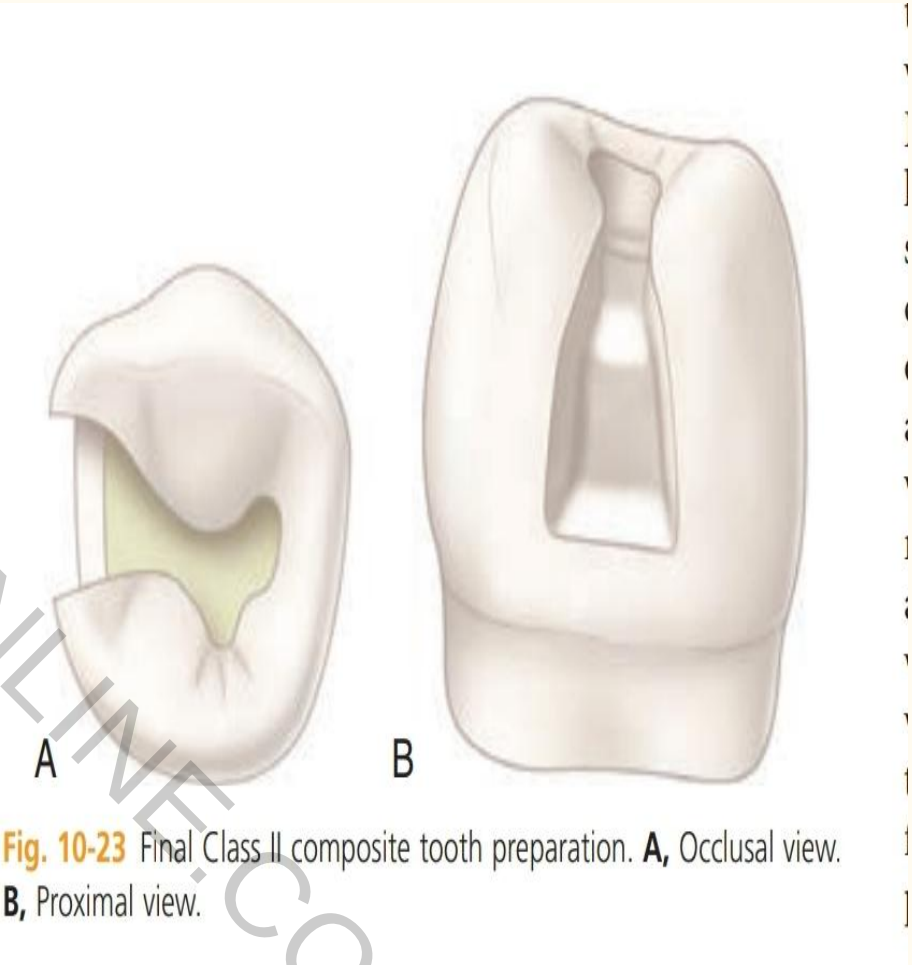


Fig. 10-23 Final Class II composite tooth preparation. **A,** Occlusal view. **B,** Proximal view.

Restorative Technique

Matrix Application

One of the most important steps in restoring Class II preparations with direct composites is the selection and proper placement of the matrix.

Class II composites are almost totally dependent on the contour and position of the matrix for establishing appropriate proximal contacts that's why Early wedging and re-tightening of the wedge during tooth preparation is advocated.

the matrix is applied before adhesive placement.

An ultra-thin metal matrix band generally is preferred for the restoration of a Class II composite because it is thinner than a typical metal band and can be contoured better than a clear polyester matrix.

When both proximal surfaces are involved, a Tofflemire retainer with an ultra-thin , burnishable matrix band is used.

Placement of the Adhesive

The technique for adhesive placement is as described earlier. Care should be exercised to avoid adhesive pooling along the matrix–gingival margin aspect of the preparation.

Restore the proximal box portion of the preparation first with incremental technique.The number of increments will depend on the size of the proximal box .
The incremental technique allows for orientation of the polymerization light beam according to the position of
each increment of composite, thus enhancing the curing potential ,intrinsic restoration characterization with darker or pigmented composites, sculpture of the restoration occlusal stratum with a more translucent material simulating the natural enamel. Tight proximal contacts can also be better achieved when composite is applied in increments.

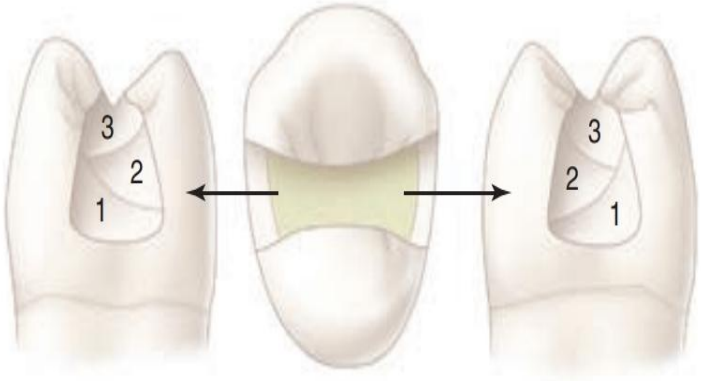


Fig. 10-27 Oblique incremental technique to restore proximal boxes in Class II direct composite restorations. The number of increments will depend on the size of the proximal box. The first increment(s) (1) should be placed along the gingival floor and should extend slightly up the facial wall. This increment should be only approximately 1 to 2 mm thick because it is the farthest increment from the curing light and the most critical in establishing a proper gingival seal. A second increment is then placed against the lingual wall, to restore about two thirds of the box. The final increment is then placed to complete the proximal box and develop the marginal ridge. Subsequent additions, if needed, are made and light-activated (usually not exceeding 2 mm in thickness at a time) until the proximal box is filled.

When the proximal box is completed, the occlusal step of the preparation is restored. After incremental curing, matrix is removed, and restoration is cured from the facial and lingual directions. The restoration can be contoured and finished immediately after the last increment is cured.

Contouring and Polishing of the Composite

Contouring can be initiated immediately after the composite material has been fully polymerized. If the occlusal anatomy was developed properlyduringinsertion, the need for additional contouring is greatly minimized. If contouring is needed, the occlusal surface is shaped with a round or oval,

12-bladed carbide finishing bur or finishing diamond. Excess composite is removed at the proximal margins and embrasures with a flame-shaped carbide finishing bur or finishing diamond and abrasive discs .

The rubber dam (or other means of isolation) is removed, and the occlusion is evaluated for proper contact.

Clinical Technique for Extensive Class II Direct Composite Restorations

Direct composite is not usually indicated for extensive posterior restorations but may be indicated when economic factors prevent the patient from selecting a more expensive indirect restoration.Composites also may be considered for use as a foundation for indirect restorations (crowns and onlays) when insufficient natural tooth structure is remaining to provide adequate retention and resistance form for the crown. The tooth first is restored with a large restoration and is then prepared for the indirect restoration. This type of restoration
also may be indicated as an interim restoration while waiting to determine the pulpal response or whether or not the restoration will function appropriately.
The primary differences for these very large preparations include the following: (1) some or all of the cusps may be capped,
(2) extensions in most directions are greater,
(3) secondary retention features are used, and
(4) more resistance form features are used.

Tooth Preparation

The elongated pear diamond or bur is used to prepare the occlusal step. As already indicated, the occlusal outline form is usually extensive. When moving the instrument from the central groove area toward a cuspal prominence, the pulpal depth that is approximately 0.2 mm inside the DEJ should be maintained. If a cusp must be capped, the side of the rotary instrument can be used first to make several depth cuts in the remaining cuspal form to serve as a guide for cusp reduction. Cusps should be capped as early in the tooth preparation procedure as possible, providing more access and visibility for the preparation. The depth cut is made with the instrument held parallel to the cuspal incline (from cusp tip to central groove) and approximately 1.5 to 2 mm deep.The reduced cusp has a relatively flat surface that may rise and fall with the normal mesial and distal inclines of the cusp. It also should provide enough clearance with the opposing tooth to result in approximately 1.5 to 2 mm of composite material to restore form and function. The cusp reduction should be blended in with the rest of the
occlusal step portion of the preparation.

The proximal boxes are prepared as stated earlier. The primary difference is that they may be much larger. The extent of the lesion may dictate that a proximal box extend around the line angle of the tooth to include caries or faulty facial or lingual tooth structure. When the outline form has been established , caries at the
pulpal and axial walls is excavated and the preparation is assessed carefully for additional retention form needs.Retention form can be enhanced by the placement of grooves, locks, coves, or slots. At times, bevels may be placed on
available enamel margins to enhance retention form, even on occlusal areas

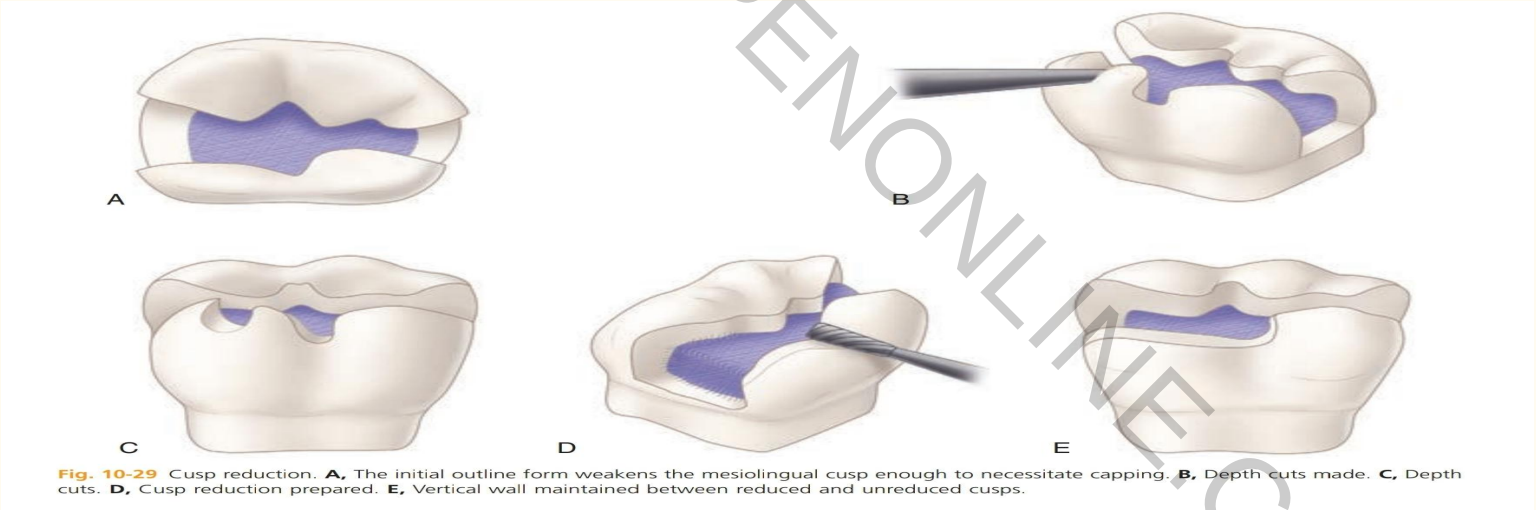


Fig. 10-29 Cusp reduction. **A,** The initial outline form weakens the mesiolingual cusp enough to necessitate capping. **B,** Depth cuts made. **C,** Depth cuts. **D,** Cusp reduction prepared. **E,** Vertical wall maintained between reduced and unreduced cusps.

-Dr.Swapnali