Class III cavity preparation for amalgam restoration

Class III restorations are indicated for defects located on the proximal surface of anterior teeth that do not affect the incisal edge. Part of the facial or lingual surfaces also may be involved in Class III restorations.







The Class III amalgam restoration is rarely used. Its use has been supplanted by tooth-colored restorations (primarily composite), which have become increasingly wear-resistant and color-stable. Because indications exist for Class III amalgam restorations, however, practitioners should be familiar with this restorative technique

Indications:

It is generally reserved for the distal surface of maxillary and mandibular canines if:

1. The preparation is extensive, with only minimal facial involvement.
2. The gingival margin involves cementum.
3. Moisture control is difficult

Contraindications:

Class III amalgam restorations usually are contraindicated in esthetically important areas because many patients object to metal restorations that are visible.

Advantages:

1. Amalgam restorations are stronger than other Class III direct restorations.
2. They are generally easier to place.
3. Less expensive to the patient.
4. Amalgam restorations are usually easier to finish and polish without damage to the adjacent surfaces

Disadvantage:

1. Metallic and unesthetic
2. Less conservative cavity preparation when compared to that of esthetic restorative materials.

Tooth preparation

A lingual access preparation on the distal surface of the maxillary canine is described here because the use of amalgam in that location is more likely. For esthetic reasons, amalgam is best suited for caries that can be accessed from the lingual instead of the facial.

A facial approach for a mandibular canine may be indicated; however, if the lesion is more facial than lingual

Initial Tooth Preparation

Outline form:

The outline form of the Class III amalgam preparation may include only the proximal surface. A lingual dovetail may be indicated if one existed previously or if additional retention is needed for a larger restoration.

1. Bur size selection depends on the size of the lesion; bur options may include a no. 2 (or smaller) round bur



2. The bur is positioned so that its long axis is perpendicular to the lingual surface of the tooth but directed at a mesial angle as close to the adjacent tooth as possible and the entry cut penetrates the caries lesion; this position conserves the marginal ridge enamel





3. Initial axial depth (0.5 mm) inside the DEJ or 0.75 mm axial depth when the gingival margin is on the root surface (in cementum). (Infected dentin that is deeper than this limited initial axial depth is removed later during final tooth preparation) the cavity of Cl III is made in a box-like preparation.
4. The facial, incisal, and gingival walls should meet the axial wall at approximately right angles (although the lingual wall meets the axial wall at an obtuse angle or may be continuous with the axial wall)

5. The axial wall should be uniformly deep into the dentin and follow the faciolingual contour of the external tooth surface.
6. Remove any unsupported enamel. ,
7. Cavosurface line angle (90-110 °).
8. Round internal line angles.
9. Incisal extension to remove carious tooth structure may eliminate the proximal contact. It is essential to conserve as much of the distoincisal tooth structure as possible to reduce the risk of subsequent fracture. It is best to leave the incisal margin in contact with the adjacent tooth when possible.

Resistance form:

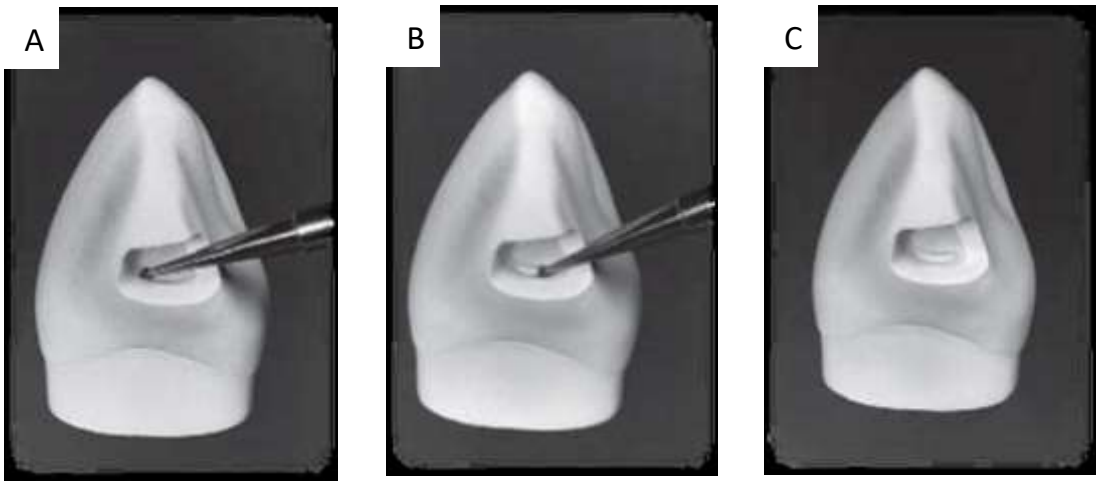
Resistance form against post-restorative fracture is provided by

1. Cavosurface and amalgam margins of 90 degrees.
2. Removal of unsupported enamel.
3. Sufficient bulk of amalgam (minimal 1-mm thickness).
4. Rounded internal angles.
5. Conserve the disto-incisal tooth structures as possible to reduce the risk of fracture

Retention form

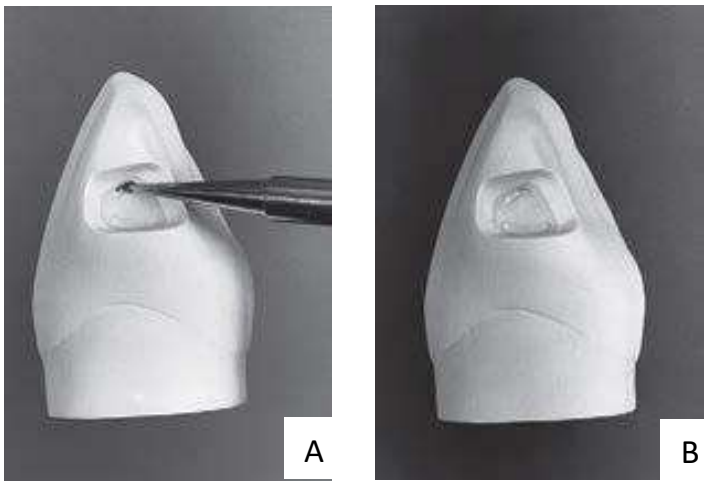
1. The box-like preparation form provides the primary retention form.
2. A secondary retention form is provided by a gingival groove, gingival cove, and sometimes a lingual dovetail

The gingival retention groove is prepared by placing a no.1/4 round bur (rotating at low speed) in the axio-facio-gingival point angle. It is positioned in the dentin to maintain 0.2 mm of dentin between the groove and the DEJ; the rotating bur is moved lingually along the axio-gingival line angle with the angle of cutting generally bisecting the angle between the gingival and axial walls.



Preparing the gingival retention form. A, Position of No. 14 round bur in axio-facio-gingival point angle. B, advancing the bur lingually to prepare the groove along the axio-gingival line angle. C, Completed gingival retention groove.

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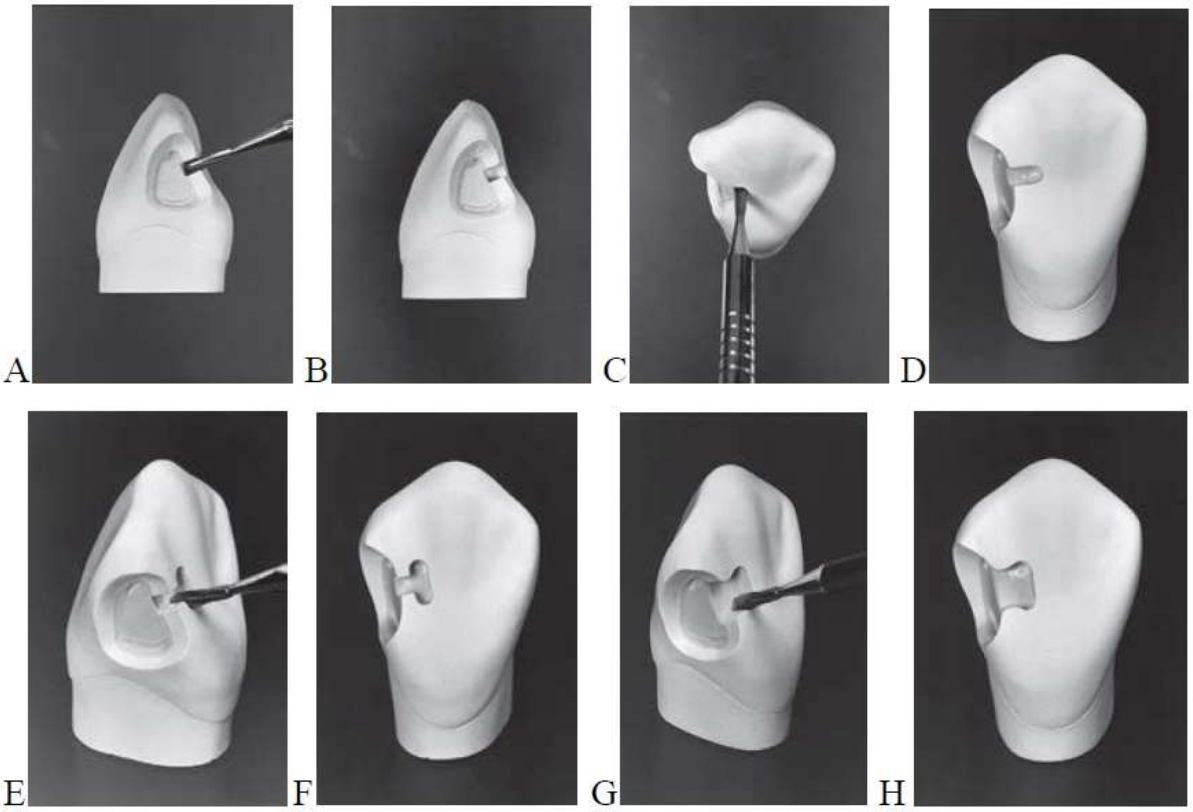


Preparing the incisal retention cove. A, Position of No. 14 round bur in the axio-incisal point angle. B, Completed incisal cove

If less retention form is needed, two gingival coves may be used, as opposed to a continuous groove placed in the axio-gingivo-facial and axio-gingivo-lingual point angles, the diameter of the 1/4 round bur is 0.5 mm, and the depth of the groove should be half this diameter (0.25 mm)

Dovetail on the lingual surface:

Lingual dovetail is required for large preparations, especially when we have extensive caries and large class III cavity, and previous retentive means are not enough, so we do dovetail on the lingual surface of maxillary canine, but this should be as conservative as possible; it should not exceed the midpoint of the lingual surface; moreover the depth should not be more than 1 mm



Lingual dovetail providing additional retention for extensive amalgam restoration. A, Bur position at correct depth and angulation to begin cutting. B, Initial cut in beginning dovetail. C, Bur moved to most mesial extent of dovetail. D, If possible, cutting should not extend beyond the midlingual position. E, Bur cutting gingival extension of the dovetail. F, Incisal and gingival extensions of the dovetail. G, Completing the isthmus. The proximal and lingual portions are connected by the incisal and gingival walls in smooth curves. H, Completed lingual dovetail.

Final Tooth Preparation

Final tooth preparation involves removing any remaining infected dentin, protecting the pulp; developing secondary resistance and retention forms; finishing external walls; and cleaning. Any remaining infected carious dentin on the axial wall is removed by using a slowly revolving round bur (No. 2 or No. 4), appropriate spoon excavators, or both.