Class III Amalgam Restorations

Definition

Class III caries:

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 the 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, or

(3) Moisture control is difficult.

Contraindications

1- In esthetically important areas because many patients object to metal restorations that are visible.
Clinical Technique for Class III Amalgam Restorations

Initial Clinical Procedures

○ Local Anesthesia

○ Isolation (rubber dam recommended)

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, use of amalgam is best suited for caries that can be accessed from the lingual rather than the facial.

A facial approach for a mandibular canine may be indicated, however, if the lesion is more facial than lingual. The mandibular restoration is often not visible at conversational distance.

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.

Initial Tooth Preparation

- Bur size selection depends on the size of the lesion. Bur options may include a No. 2 (or smaller) round bur. The bur is positioned so that the entry cut penetrates into the caries lesion, which is usually apical to (and slightly into) the contact area. Ideally, 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 (Fig 1). Penetration through enamel
positions the bur so that additional cutting isolates the proximal enamel affected by caries and removes some or all of the infected dentin. In addition, penetration should be at a limited initial axial depth (i.e., 0.5mm) inside the DEJ or at a 0.75mm axial depth when the gingival margin is on the root surface (in cementum) (Fig. 2). This 0.75-mm axial depth on the root surface allows a 0.25-mm distance (the diameter of the No. 1/4 bur is 0.5 mm) between the retention groove (which is placed later) and the gingival cavosurface margin. Infected dentin that is deeper than this limited initial axial depth is removed later during final tooth preparation.

Fig. 1- Entry for Class III tooth preparation on maxillary canine. A, Bur position is perpendicular to the enamel surface at the point of entry. B, Initial penetration through enamel is directed toward cavitated, caries lesion. C, Initial entry should isolate the proximal enamel, while preserving as much of the marginal ridge as possible. D, Initial cutting reveals the dentinoenamel junction (DEJ).
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).

The axial wall should be uniformly deep into dentin and follow the faciolingual contour of the external tooth surface.

Remove any unsupported enamel.

Cavosurface line angle (90-110 °).

Round internal line angles. If a large round bur is used, the internal angles are more rounded.

Incisal extension to remove carious tooth structure may eliminate the proximal contact. It is important to conserve as much of the distoincisal tooth structure as possible to reduce the risk for subsequent fracture. When possible, it is best to leave the incisal margin in contact with the adjacent tooth.
When preparing a gingival wall that is near the level of the rubber dam or apical to it, it is beneficial to place a wedge in the gingival embrasure earlier to depress and protect soft tissue and the rubber dam.

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.

Resistance form

Resistance form against post-restorative fracture is provided by
(1) cavosurface and amalgam margins of 90 degrees,
(2) enamel walls supported by sound dentin,
(3) sufficient bulk of amalgam (minimal 1-mm thickness), and
(4) no sharp preparation internal angles.

Retention form

(1) The box-like preparation form provides primary retention form.
(2) Secondary retention form is provided by a gingival groove, an incisal cove, and sometimes a lingual dovetail.

The gingival retention groove is prepared by placing a No. \( \frac{1}{4} \) 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. Ideally, the direction of the gingival groove is slightly more gingival than axial (and the direction of an
incisal [i.e., occlusal] groove would be slightly more incisal [i.e., occlusal] than axial).

**Dovetail on the lingual surface:**

If we have extensive caries and large class III cavity and previous retentive means is 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 also the depth should not be more than 1mm, if we make it with the same depth of the cavity, it may hit the pulp.

If we create a dovetail we will have axiopulpal line angle which should be beveled.