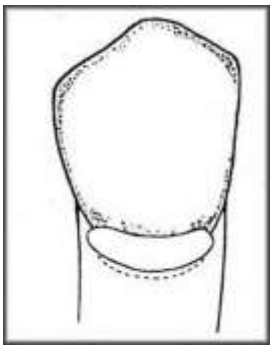
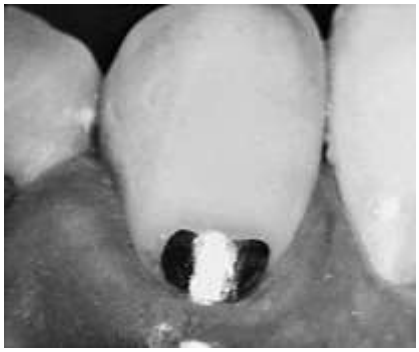
Class V cavity preparation for amalgam restoration

Class V Caries: Smooth surface carious lesions located on the gingival/cervical third of labial/buccal and more rarely the lingual surfaces of all teeth.
Simple lesions since it mostly involves one surface of a tooth.





Caries is not only the reason for cavitation, abrasion and erosion may be also responsible
Erosion: tooth loss at the cervical area due to a non-bacterial acid attack



Abrasion: tooth loss at the cervical area of the tooth due to abrasive slurry between two surfaces (mechanical action) e.g: toothbrush – dentifrice abrasion



Restorative materials for Class V cavity:

- Amalgam
- Composite
- Resin modified GIC
- Compomers

Indications for amalgam:

- Non-esthetic areas
- Areas where access and visibility are limited
- Areas where moisture control is difficult
- Areas that are significantly deep gingivally

Contraindications:

Contraindications for amalgam as a restorative material include the esthetically important areas

Clinical technique for class V amalgam preparation

Initial Clinical Procedures

- Local Anesthesia
- Isolation (rubber dam recommended)

Initial tooth preparation

Outline form:

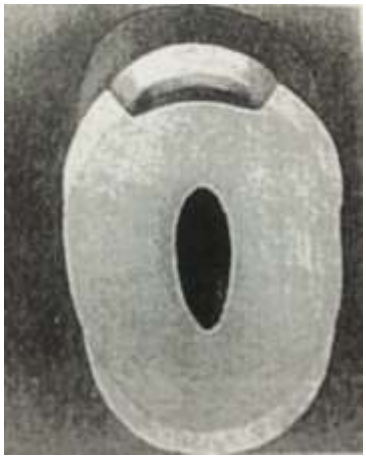
1. Rounded trapezoid in gingival 1/3.
2. Conforms to the tooth shape, typical caries location, and site of plaque accumulation.
3. Primarily determined by the location and size of caries/defects or old restorative material
4. Cavosurface margins should be extended to sound tooth structure while maintaining a limited axial depth of 0.5 mm inside the DEJ and 0.75 mm inside the cementum (when on the root surface)





5. Using a round bur to start entry to the cavity, the direction of the bur should perpendicular to the buccal (or palatal) surface of the tooth, then using a tapered fissure bur of suitable size, enter the carious lesion to a limited initial axial depth of 0.5 mm inside the DEJ.
6. This depth is usually 1 to 1.25 mm total axial depth, depending on the incisogingival/occlusogingival location (Axial wall depth at the occlusal wall should be more than at the gingival wall)

7. However, if the preparation is on the root- surface, the axial depth is approximately 0.75 mm.
8. Extend the preparation incisally, gingivally, mesially, and distally until the cavosurface margins are positioned in sound tooth structure providing the desired outline form
9. Preparation of the axial wall depth 0.5 mm inside the DEJ results in a uniform depth for the entire preparation
10. Because the axial wall follows the mesiodistal and incisogingival/occlusogingival contours of the facial surface of the tooth, it will usually be convex in both directions



11. The mesial, distal, gingival, and incisal walls of the tooth preparation are perpendicular to the external tooth surface to keep the cavosurface angle 90 degrees and to follow the direction of enamel rods

Consequently, this form provides no inherent retention, and a retention form must be provided

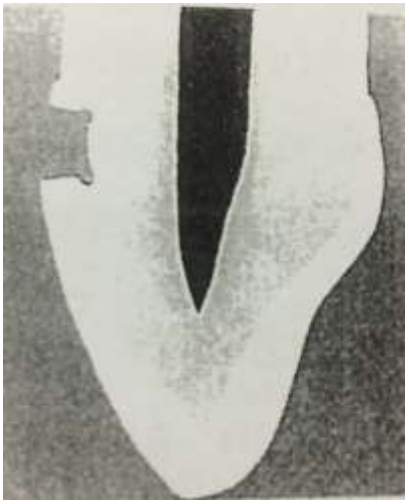
Resistance form:

1. The depth of the cavity is 1.5mm: the axial wall of the cavity should not be flat, if we do so will not have an even depth of the cavity because of the convexity of tooth structure, so the axial wall should be slightly convex
2. Cavosurface line angle (90º-110º).

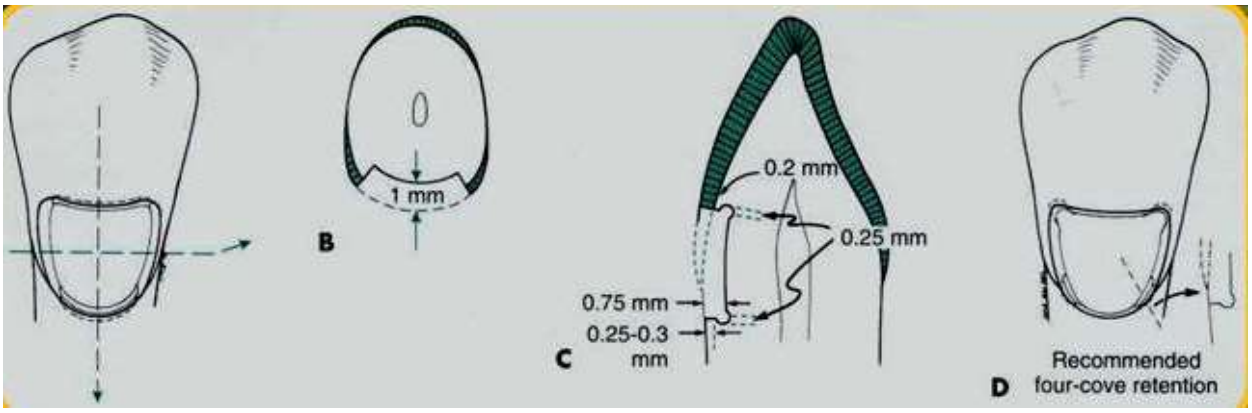
3. Rounded internal line angles
4. Removal of unsupported enamel
5. Mesial and distal walls should be slightly diverge
6. Occlusal and gingival walls should be perpendicular to the long axis of the tooth and parallel to each other, any convergence of these walls will create unsupported enamel.

Retention form:

1. Use a No. 1/4 bur to prepare two retention grooves, one along the incisoaxial line angle and the other along the gingivoaxial line angle 0.2-0.3mm inside the DEJ.
2. The handpiece is positioned so that the No. 1/4 bur is directed generally to bisect the angle formed at the junction of the axial wall and the incisal/occlusal or gingival wall



3. Ideally, the direction of the incisal (i.e., occlusal) groove is slightly more incisal (i.e., occlusal) than axial, and the direction of the gingival groove is slightly more gingival than axial.
4. Alternatively, four retention holes may be prepared, one in each of the four axial point angles of the preparation



Retention Grooves: Extended Class V tooth preparation (A) with the axial wall contoured parallel to the dentinoenamel junction (DEJ) mesiodistally (B) and incisogingivally (C). The axial wall pulpal depth is 1 mm in the crown and 0.75 mm in the root. In addition, note location and direction depth (0.25 mm) of the retention grooves and the dimension of the gingival wall (0.25 mm) from the root surface to the retention groove. D, Large Class V preparation with retention coves prepared in the four axial point angles

Final preparation:

1. Removal of any remaining infected dentin
2. Pulp protection
3. Finishing external walls
4. Cleaning & inspecting

Summary

- Outline form - Rounded Trapezoid
- Axial Depth- 1- 1.25 mm (when margins in enamel), 0.75 mm when margins are in cementum (Root surface)
- Axial wall- 0.5 mm inside DEJ, Convex in all directions to conform the external tooth contour
- Divergent Incisal, Gingival, Mesial & Distal walls- follow the direction of enamel rods
- Retention features- Grooves & Coves- 0.2- 0.3 mm inside DEJ using 1/4 round bur