Conservative dentistry

Lec: 4 **Dr. Zanbaq**

Classification of Cavity

1. According to tooth surface involvement:

Simple cavity: cavity involve only one surface of the tooth Ex: occlusal cavity (O) CL I.

Compound cavity: cavity that involved two surfaces Ex: mesio-occlusal (MO) CLII.

Complex cavity: cavity involve three or more surfaces.

2. According to site involved:

Site 1: pits, fissure and enamel defects on occlusal surfaces of posterior or other smooth surfaces.

Site 2: proximal enamel in relation to areas in contact with adjacent teeth.

Site 3: the cervical one third of the crown or following gingival recession and the exposed root surface.

3. According to G.V. Black:

CLI restorations: these restorations are used in CL I lesions the following surfaces are involved:

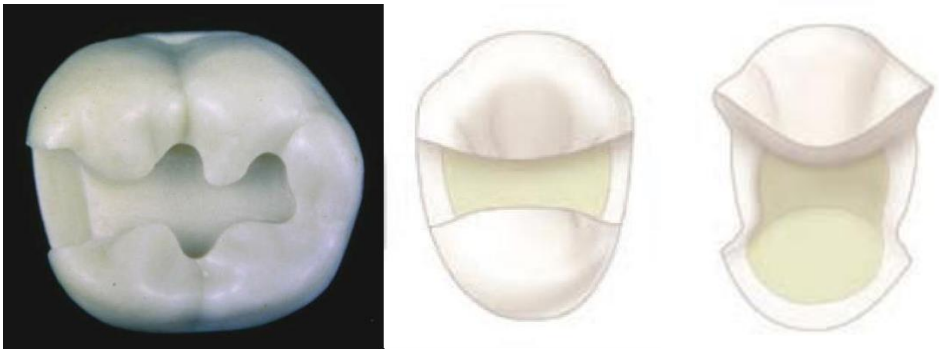
- Occlusal pits and fissures of premolars and molars fig 1a.
- Facial & lingual pits and fissures of mandibular molars fig 1b.
- Palatal pits of maxillary incisors, most frequently in the pit near the cingulum.

A b c

Fig 1: Cl I

CL II restorations: is the extension of CLI restoration into the proximal surfaces of premolars and molars, the following surfaces are involved:

- Two surface restoration of posterior teeth fig 2a.
- Three surface restoration of posterior teeth fig 2b.
- Four surface (or more) restoration of posterior teeth fig 2c.



a b c

Fig 2. Cl II

CLIII: affects the interproximal surface of incisors and canines fig 3.

Fig 3: CL III

CLIV: involves a larger surface area, including the incisal edges and interproximal surface of incisors and canine fig 4.

Fig 4: CL IV

CL V: - gingival third of the facial or lingual surfaces of any tooth.

- -Root of a tooth near the cemento-enamel junction fig 5.

Fig 5: CL V

Cl IV: incisal edge of anterior teeth or on cusp tip of posterior teeth

Objectives of cavity preparation

1- To remove diseased tissue as necessary and at the same time provides the protection to the pulp.
2- To locate the margins of the restoration as conservative as possible.
3- To ensure the cavity form, it should not be under the force of mastication of the tooth.
4- To allow the functional placement of the restorative material.

Steps in the cavity preparation (Given by G. V. Black)

Obtain outline form.

Obtain resistance form

Obtain retention form.

Obtain convenience form.

Removal of remaining carious dentin.

Finishing of enamel walls & margins

Performing the toilet of the cavity.

Class I cavity

1. **Outline form:** is the shape of the cavity which the Cavosurface line angle of the cavity assumes after preparation.

Access:

- Gain initial access via the most carious part of the tooth.
- Margins should be placed on sound tooth structures.
- In cl I all occlusal fissures and at least that in the developmental grooves have been included in the preparation even hen caries has not extended through out

the fissure because it has been noted that carious dentin although not evident visually or radiographically seen at the base of fissures. There is a strong evidence that carious dentine may be present at the base of a sealed fissure, (**extension *for prevention***).

2. **Retention form:** is the shape of the cavity that permits the restoration to resist displacement through the tipping or lifting force.

To provide retention the cavity have the following:

Opposing wall of should be parallel to each other or converge occlusally (5^0) this convergence done on buccal and lingual wall fig 7.

The floor of the cavity should be flat to prevent restoration movement.

Outline form should be small as possible to prevent displacing force on it.

3. Resistance form

Is the shape of the cavity that enables both the tooth and restoration to withstand occlusal forces without fracture.

And this includes:

1. Prevention of fracture of the tooth

- The facio-lingual width of the preparation should not exceed 1\4 intercuspal distance fig 6.

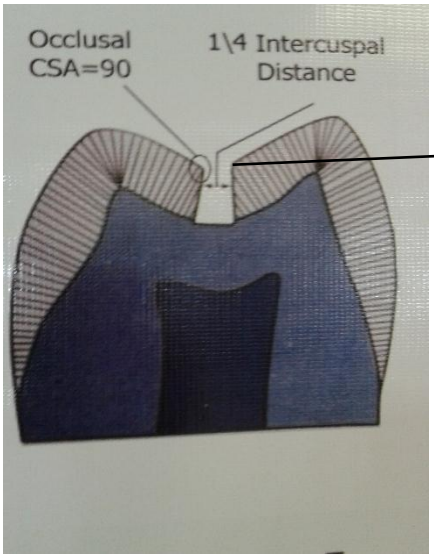


Fig 6: resistance means of CL I.

- Removal of unsupported enamel by making the margin (90^0-110^0) because less than 90^0 the tooth is more subjected to fracture.
- Smooth pulpal floor to prevent stress concentration area.
- Mesial & distal walls of the cavity should be parallel and slightly diverge occlusally to be within the enamel rod direction and prevent any unsupported enamel at the marginal ridge.
- All internal line angle should be rounded to prevent stress concentration area.

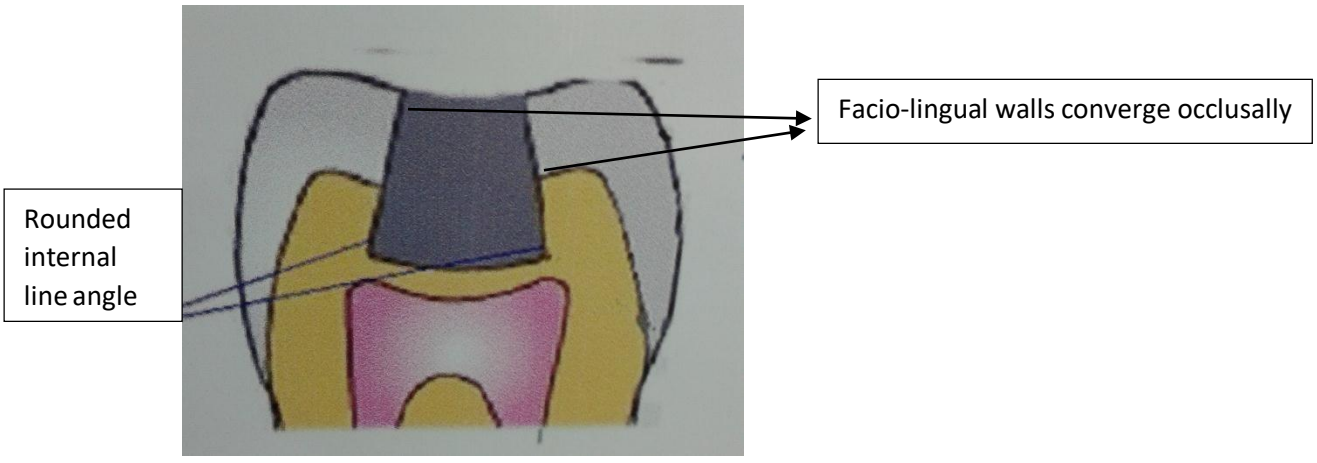


Fig 7

2-Preventing fracture of restoration

- The margins or Cavosurface line angle should be (90^0-110^0) if more than thislead to fracture of restoration.
- Facio-lingual width should be 1\4 intercuspal distance because large surfacearea exposed to more force and fracture occur.
- Occlusal amalgam should have thickness of (1.5-2.0 mm) to resist fractureduring function.
- The pulpal floor should be smooth to prevent concentration area on restoration.

4. Convenience form:

Is the shape of the cavity that allows an adequate observation, accessability this achieved by giving good depth (1.5-2mm) and width (1\4) intercuspal distance.

5. Removal of remaining caries

Deep dentinal caries can be removed by using spoon excavator or large roundbur with slow speed hand piece.

6. Finish enamel walls

Involve making the wall smooth and removing of unsupported enamel.

7. Clean the preparation:

Removal of all debris by washing the cavity and drying it.

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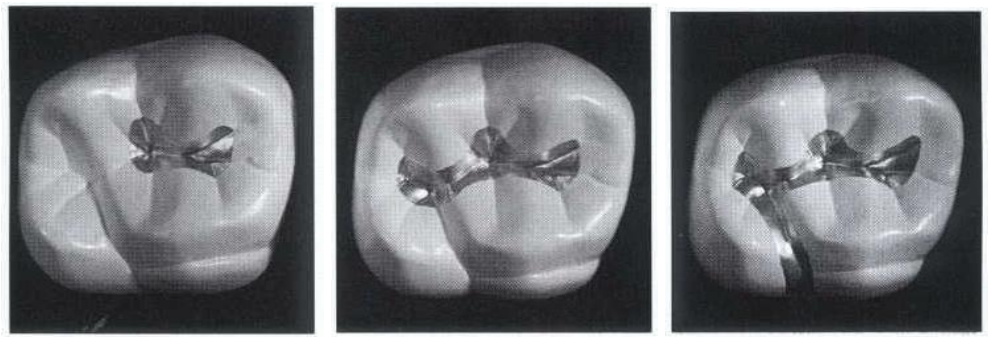
In class I there are 2 exceptions:

The upper first molar and the lower first premolar

In the upper first molar there is oblique ridge between the mesio-lingual cusp and the distobuccal cusp while in the lower first premolar there is transverse ridge between the buccal and lingual cusps. These two ridges are too hard and not crossed by grooves and usually not affected by caries; therefore special care must be given not to include them in the cavity preparation, so two separate cavities should be done, one mesial and the other distal.



In case of the upper first molar

There is a distal groove that continues form the occlusal surface to the palatal surface and ends in a non-coalesced pit so the caries can spread along this groove.

According to the mesial cavity**,** the entry is done by round bur then the outline form is determined by fissure bur.

Retention Mean: The buccal and lingual walls converged occlusally.

Resistance Mean: Width of the cavity should be a ¼ of the inter-cuspal distance.

While for the distal cavity: the outline form of the cavity is limited to the carious lesion. But if the caries extends to the palatal surface along the groove and reach the palatal pit it has to be included in the cavity preparation. Then the fissure bur is moved with the same depth to extend the cavity lingually and include the carious groove and when the cavity is opened to the lingual surface the carious fissure is included and there are 2 ways to achieve that:

1) Keep the fissure bur perpendicular to the occlusal surface and cut 1.5–2 mm form the occlusal surface and keep cutting gingivally until we include the carious fissure and reach sound tooth structure.
2) Tilt the fissure bur to be perpendicular to the lingual surface and extended about 1.5-2 mm on the occlusal surface and move gingivally to remove the carious fissure until reaching a sound tooth structure.

• The tooth preparation should be not wider than necessary; ideally the mesiodistal width of the lingual extension should not exceed 1 mm, except for extension necessary to remove carious or undermined enamel or to include unusual Assuring.

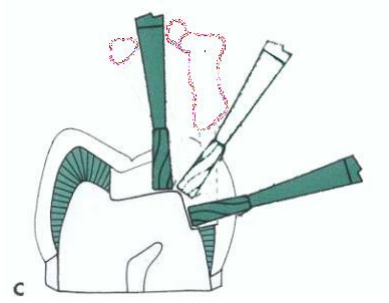
Retention mean:

1) Flat pulpal floor.
2) Buccal and palatal walls converged occlusally.

Resistance mean:

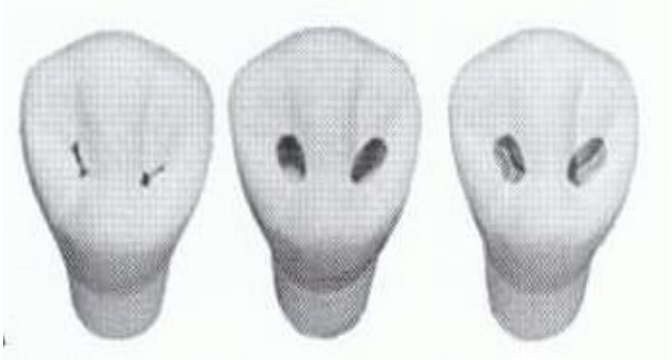
Is the same for the occlusal part with one exception, in order to prevent formation of stress concentration areas and fracture of restoration the axio-pulpal line angle must be beveled.

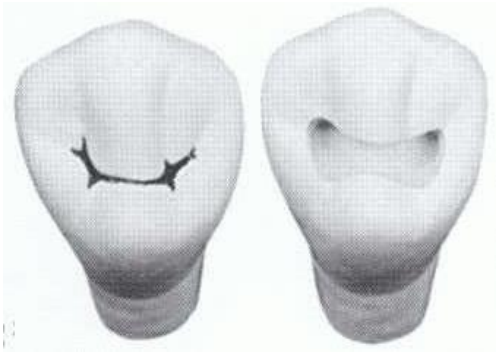
** If the caries has extended from the mesial and distal carious lesion to the oblique ridge, the oblique ridge must be included in the cavity preparation until reaching sound tooth structure. If the width of oblique ridge was 0.5 mm or less it has to be cavity by joining the mesial and distal cavities because the oblique ridge can't withstand the masticatory forces.



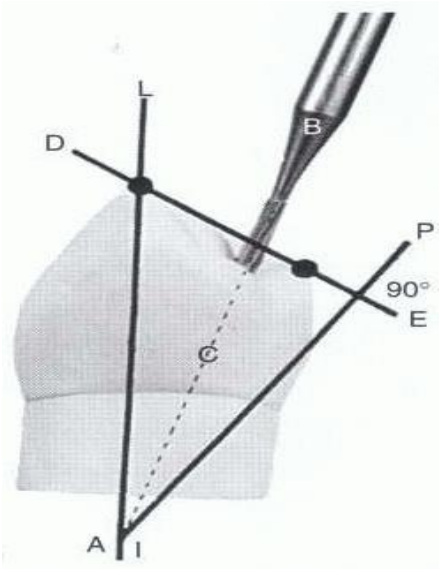
In case of the lower first premolar

A. There is a transverse ridge between the buccal and lingual cusps, so two separate cavities mesial and distal are done, but if the caries extends and affects the transverse ridge, it should be removed and one cavity is formed.





B. The buccal cusp is much higher than the lingual cusp; consequently the buccal pulp horn is much higher than the lingual pulp horn. Therefore by doing conventional class I cavity we may hit the buccal pulpal horn so the entry of the (round, fissure) should be tilted 45o lingually, in order to protect the pulp and the pulpal floor would also be tilted 45o lingually.

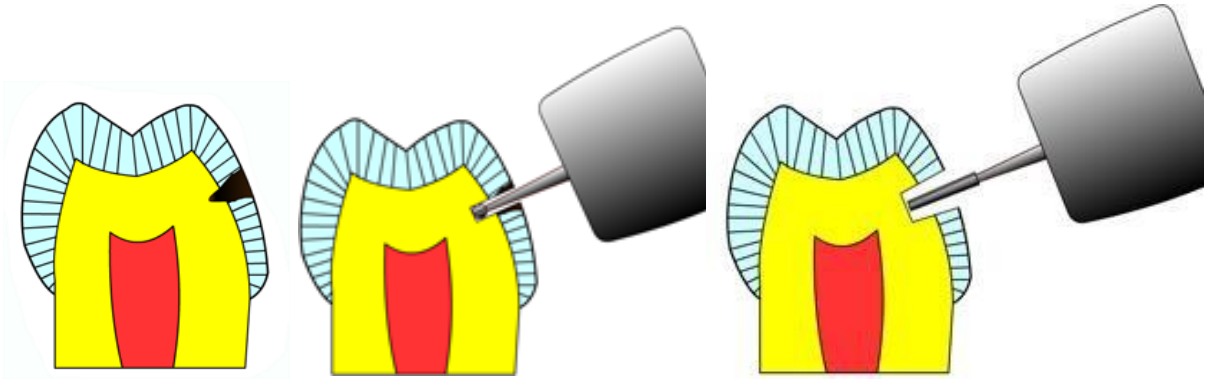


Cavity preparation for the buccal pit:

The buccal pit is found in mandibular molars mostly in the buccal surface of the mandibular molars at the end of the development groove that originates from the occlusal surface and continues to the buccal surface between the mesio buccal, middle buccal cusps and ends in the non-coalesced pit that is susceptible to caries. The buccal pit's position occluso-gingivally is located between the occlusal and middle thirds of the tooth.

The pit carious lesion has a triangular outline form therefore, the shape of the cavity must be triangular the tip of the triangle is directed occlusally while the base is directed cervically. The pit has a cone shape with its base on the enamel surface and the apex at or directed to the DEJ.

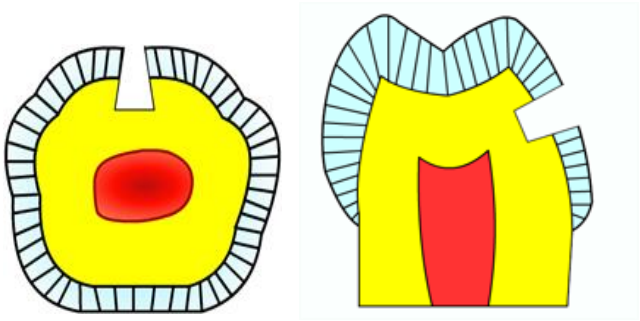
The entry is done by using a round bur to determine the depth then the fissure bur is used to determine the outline form until reaching sound tooth structure. The outline form will be triangular in shape because the spread of caries is triangular in shape.



Retention means

1) The mesial and distal walls should be converged to the outside (to maintain the enamel rods perpendicular to the outer surface and prevent occurrence of unsupported enamel),

2) The gingival seat should be perpendicular to the outer surface.
3) The axial wall should be flat (not saucer in shape).



Resistance Means

(1) Depth is about 1.5-2 mm,
(2) The cavo–surface line angle range between (90^{o}-110^{o}),
(3) Rounded line angles,
(4) Gingival seat perpendicular to the outer buccal surface

The depth should be 1.5-2 mm and equal all around the cavity.

Because the buccal surface of the lower molars near the occlusal 1/3 becomes inclinesocclusally to have equal stress distribution to prevent fracture of restoration.