3. PRIMARY RETENTION FORM

Def: is that form, shape and configuration of the tooth preparation that resists the displacement or removal of restoration from the preparation under lifting and tipping masticatory forces.

*Resistance form, resists fracture

* Convenience form, Accessable form

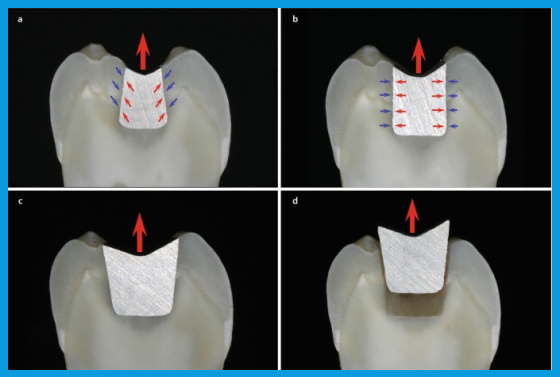
RETENTION MECHANISMS:

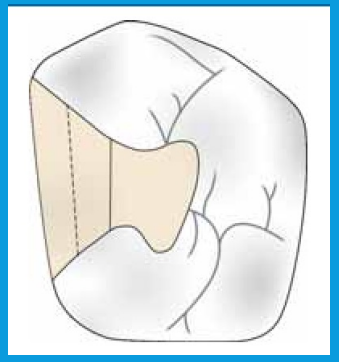
Amalgam: Retention is increased in amalgam restoration by the following:

– occlusal convergence of the buccal and lingual walls towards the tooth surface.

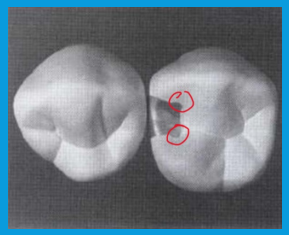
– Conserving the marginal ridges

– Providing occlusal dovetail(class II) .





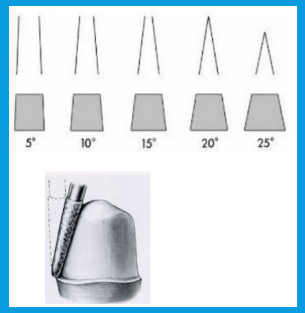
– Or grooves if it was box only

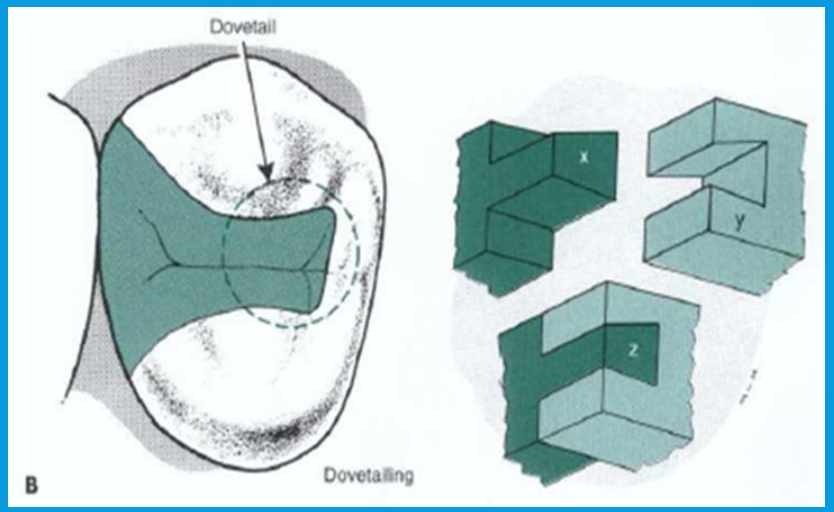


RETENTION MECHANISM

Cast metals:

- Close parallelism of the opposing walls with slight occlusal divergence of 2°–5°





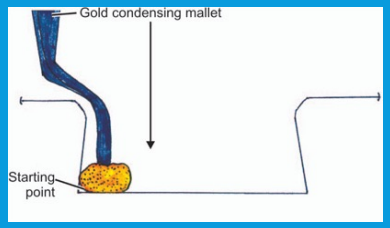
Composites: In composites, retention is increased by:

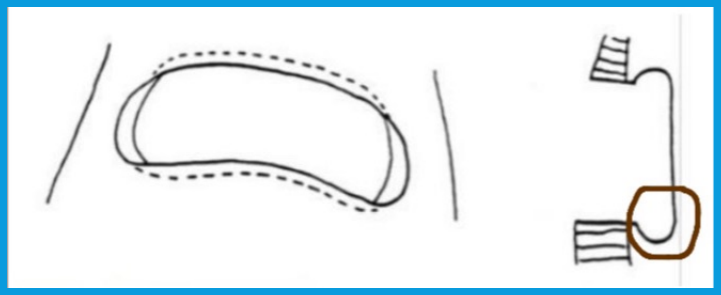
- Micromechanical bonding between the etched and primed prepared tooth structure and the composite resin.

Roughning of surface by diamond increase retention.

In class V in root retention groove axiogingivally give primary retention.

- Direct filling gold: Elastic compression of dentin and starting point in dentin provide retention in direct gold fillings by proper condensation.





4. OBTAIN THE REQUIRED CONVENIENCE FORM

Convenience Form

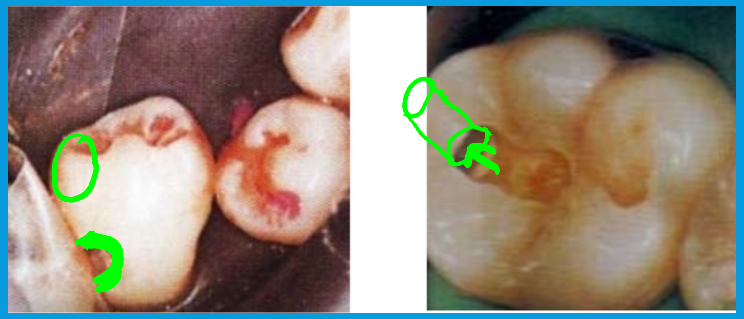
Definition: The convenience form is that form which facilitates and provides adequate visibility, accessibility and ease of operation during preparation and restoration of the tooth.

FEATURES OF CONVENIENCE FORM

- Sufficient extension of distal, mesial, facial or lingual walls to gain adequate access to the deeper portion of the preparation.
- Cavosurface margin of the preparation should be related to the selected restorative material for the purpose of convenience and marginal adaptation.

FEATURES OF CONVENIENCE FORM

- In class II preparations, access is made through occlusal surface for convenience form.
- Proximal clearance is provided from the adjoining tooth during class II tooth preparation.



FEATURES OF CONVENIENCE FORM

To make Class II tunnel preparation, for convenience, the proximal caries in posterior teeth is approached through a

tunnel initiating from the occlusal surface and ending on carious lesion on the proximal surface without cutting the

marginal ridge.

• for cast gold restorations occlusal

divergence is one of the features of convenience form.

5-REMOVAL OF REMAINING CARIES :

Hand method

spoon excavator removes soft infected dentin.

Sharp excavator from periphery toward the center with light force

Rotary method

low speed, for more control

Use round carbid bur with light pressure and intermittent strokes.

Moderate cavity extend to firm dentin. (not soft, check by the spoon.)

- Infected and affected dentine
  - Spots in the floor
    - Demineralized
    - Decollagenated
    - high load of bacteria
    - you can't leave it
  - ADJ
    - Healthy collagen fiber
    - just demineralized
    - not invaded by bacteria (not contaminated)
    - you can leave it.

ADVANCED LESION

1- the pulpal and axial caries removal should extend to approximately 1 mm from the pulp with the recognition that dentin in this deep region may still be soft (soft dentin) to tactile sense.

2- Carious dentin in more peripheral

areas is removed until the dentin is firm

5-REMOVAL OF OLD RESTORATION:

Old restorative material should be removed if :

(1) may negatively affect the esthetic

(old amalgam material left under a new composite),

(2) radiographic evidence indicates caries lesion under the old material

recurrent caries

— you can't follow 1.5 rule .

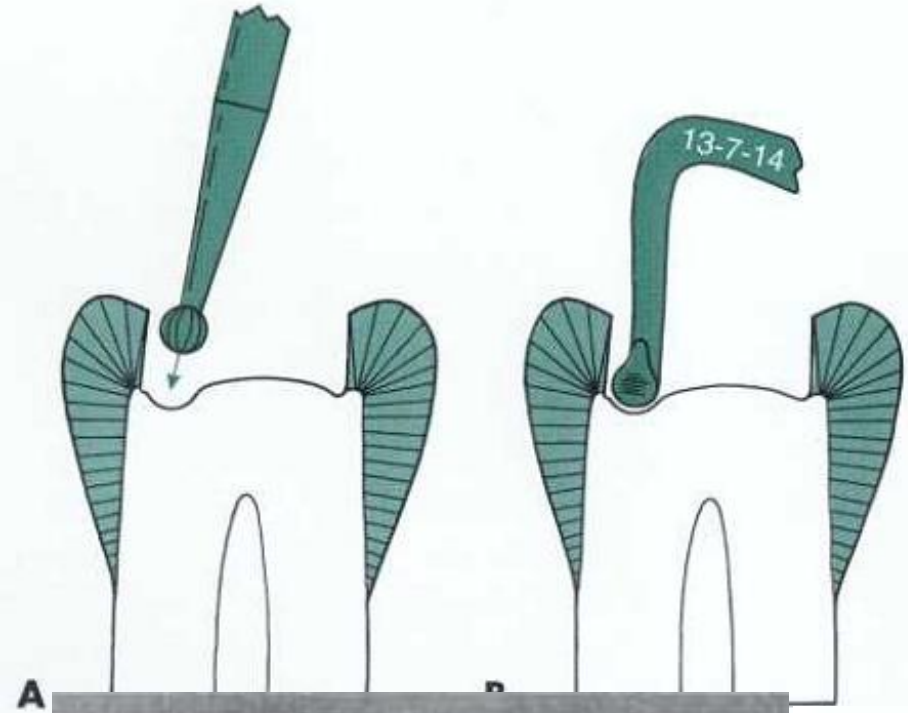
REMOVAL OF REMAINING OLD RESTORATION

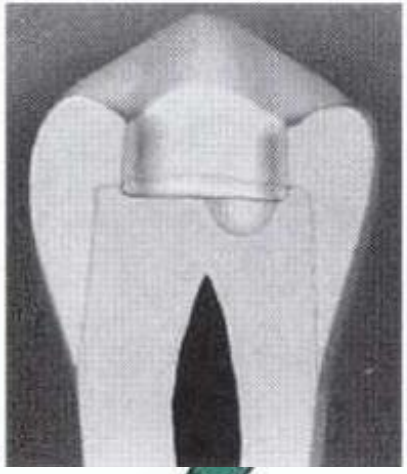
(3) the tooth pulp was symptomatic preoperatively, (4) the dentin along the periphery of the old restorative material is soft

(5)retention of the existing material is compromised

and the material

- If none of these conditions is present, it is
- acceptable to leave the remaining old restoration to serve as a base, rather than risk unnecessary excavation in close proximity to pulp



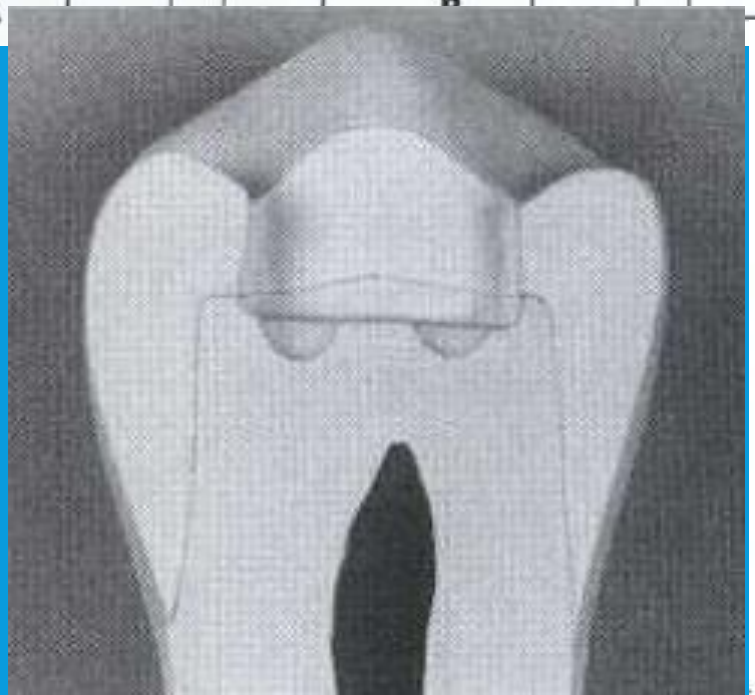


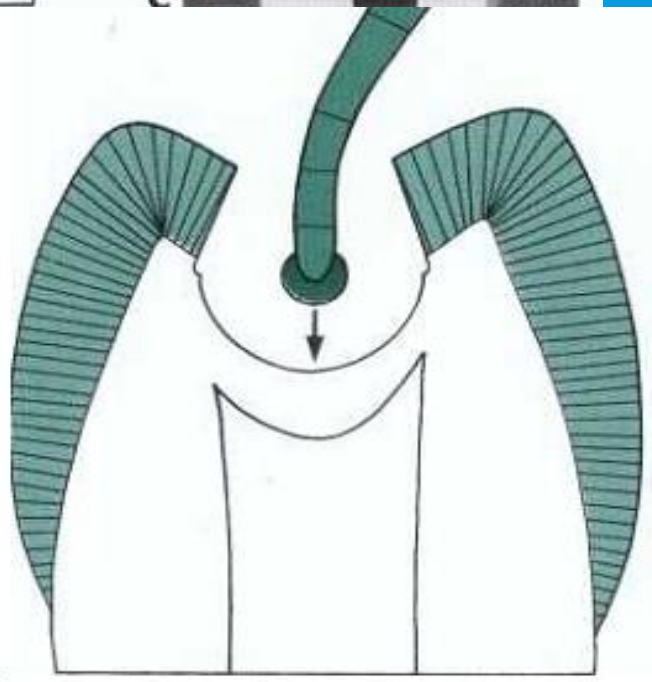
Flat floor

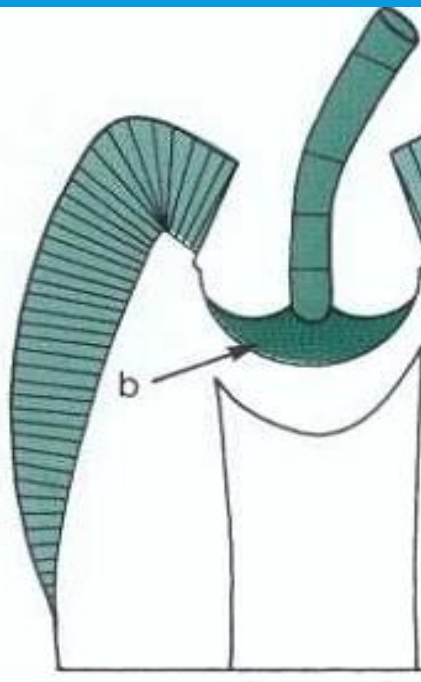
=

Resistance form

How ?!







6- PULP PROTECTION

Deep dentin is very porous and thin. provides little protection from

(1)heat generated by rotary instruments

- (2)noxious ingredients of restorative materials, (3) thermal changes
- (4) forces transmitted through materials to the dentin,
- (5) galvanic shock
- (6)the ingress of bacteria

- So you need at least 2 mm of healthy tissue at the interface

- check the space through X-Ray

BASES AND LINERS : Subsitute heathy dentin.

- Thick layer 1–2 mm applied along the cavity to provide mechanical support
- Thin layer at deepest point of the cavity, gives chemical protection

irritant material if it was close to the pulp < 0.5 mm — Sedative

Provides biological approach of protection:
- Stimulate 2nd dentin production (Dentin bridging)

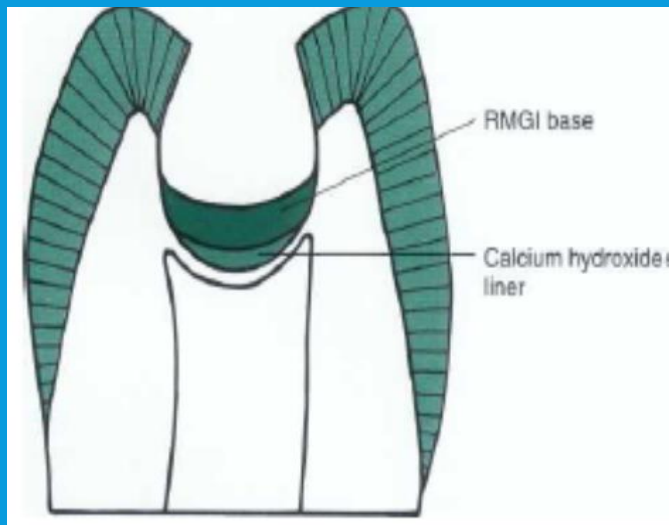
- Suspensions or dispersions of zinc oxide, calcium hydroxide, (RMGI) that are applied to the deep tooth surface as a protective barrier. referred to as Best recent liner material → Calcium sillicate based (MTA, Biodentin)
- liners when used in a relatively thin film. the term *base* is used to describe the materials, used in thicker dimensions, beneath permanent restorations to provide for mechanical, chemical, and thermal protection

- Prevent force of condensation applied on amalgam
- Cushoing effect during masticatory forces.

- Amalgam
- Composite

BASES AND LINERS

- bases include zinc phosphate, zinc
- oxide–eugenol, polycarboxylate, RMGI). Generally, it is desirable to have approximately a 2-mm dimension of bulk between the
- pulp and a metallic restorative material.
- this bulk may include
- remaining dentin, liner, or base.

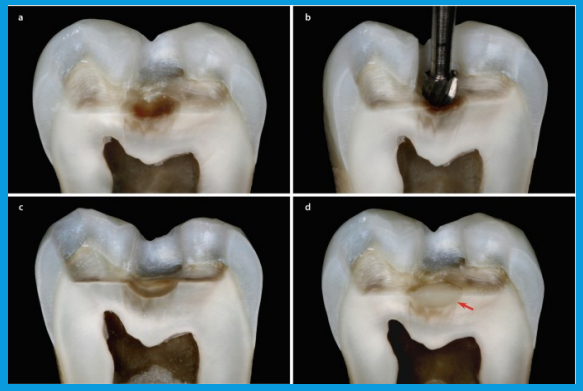


BASES AND LINERS

If the removal of soft dentin does not extend deeper than 1to 2 mm from the initially prepared pulpal or axial wall, usually no liner is indicated.

- If the excavation extends to within 0.5 mm
- of the pulp, a liner usually is selected to cover the deepest area of the dentin. ($CaOH_2$)
- liner may be effective to stimulate reperative dentin.

not ZOE



$CAOH_2$

Base

- $CaOH_2$ liners must always be covered with a RMGI when used under amalgam restorations to prevent dissolution of the liner over time.
- In addition, $CaOH_2$ liners should be covered by a RMGI to protect liner from dissolution by acid etch

Amalgam

Composite

Additional

SECONDARY RESISTANCE AND RETENTION FORM

two types:

(1) mechanical preparation features Amalgam

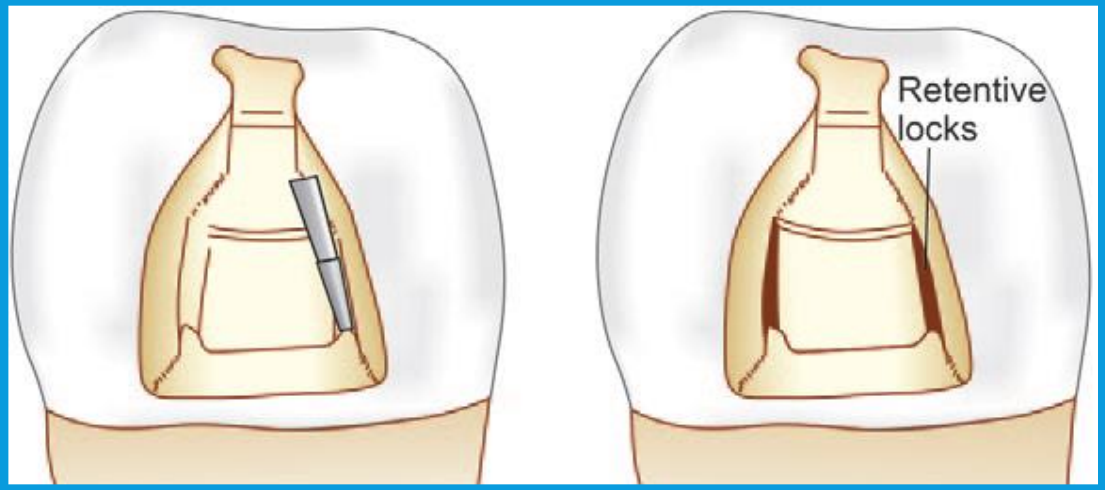
(2) treatments of the preparation walls with etching, priming, and adhesive composite

Materials

(not considered step of preparation).

RETENTION GROOVES AND COVES.

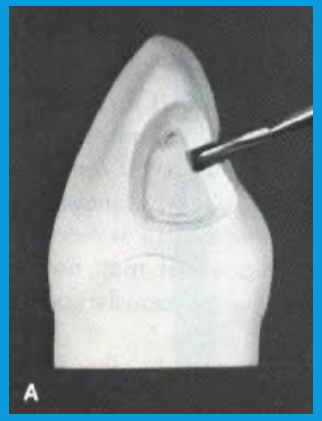
- Vertically oriented grooves(locks): of the facial and lingual aspects of a proximal preparation are used to provide additional retention for wide faciolingual proximal boxes in Class II amalgam restorations.
- Horizontally oriented grooves: (Slots) prepared in most Class III and V for amalgam and in some root-surface tooth preparations for amalgam and composite resin.

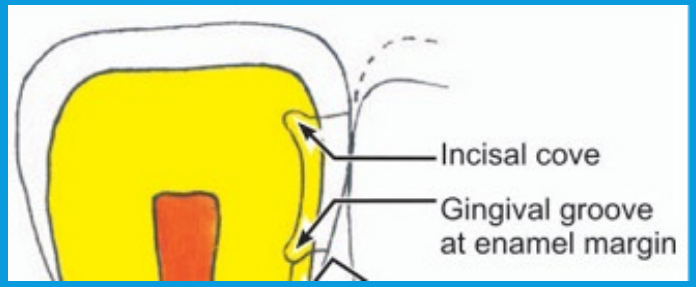

Retentive
locks

COVES

Small retentive indentions,

referred to as "coves," are utilized for retention in the incisal point angles of Class III amalgams.

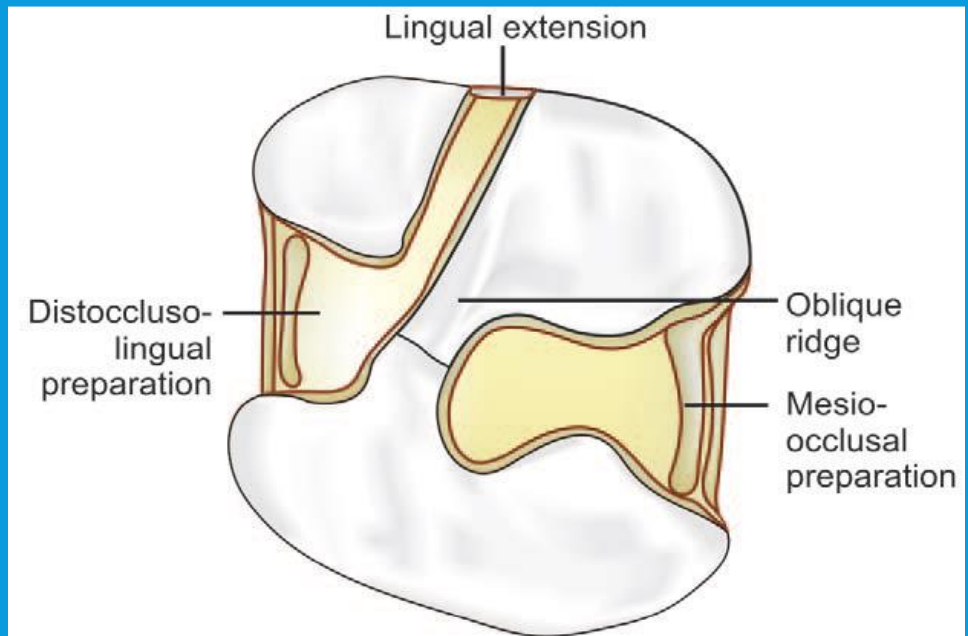




PREPARATION EXTENSIONS

Additional retention of the cast

materials may be obtained by arbitrarily extending the preparation for molars onto the facial or lingual surface to include a facial or lingual groove



SKIRTS

Skirts are preparation features used in cast gold restorations that extend the preparation around some, if not all, of the line angles of the tooth.

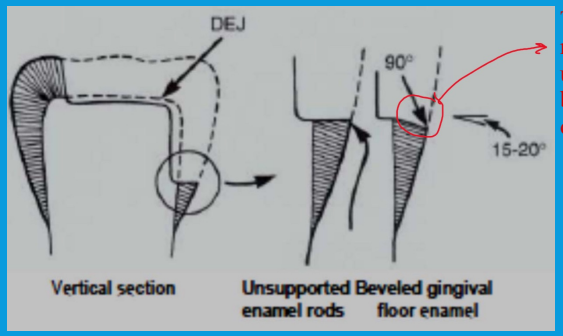
BEVELED ENAMEL MARGIN

Some cast-metal and composite preparations include beveled margin. the bevels for cast-metal restorations are used primarily to afford a better junctional relationship

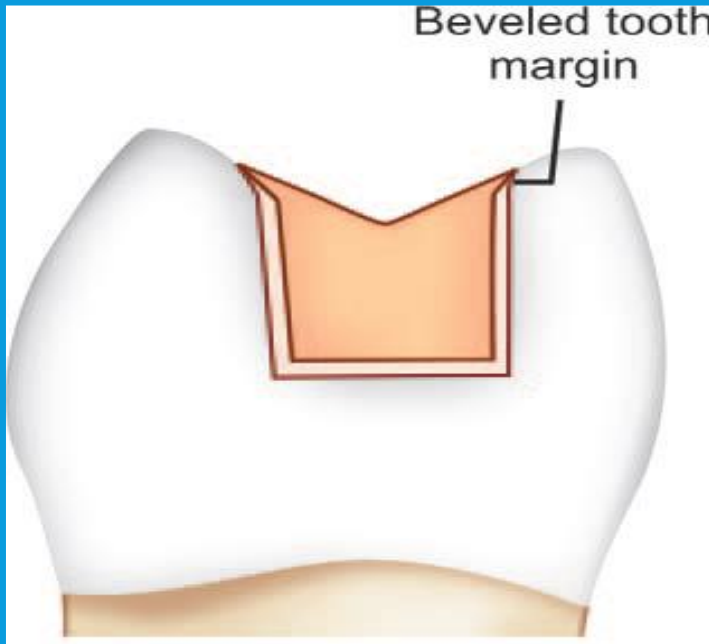
Between the metal

and the tooth

- Bevel is contraindicated in amalgam except on gingival margin of the proximal box, to remove undermined enamel.

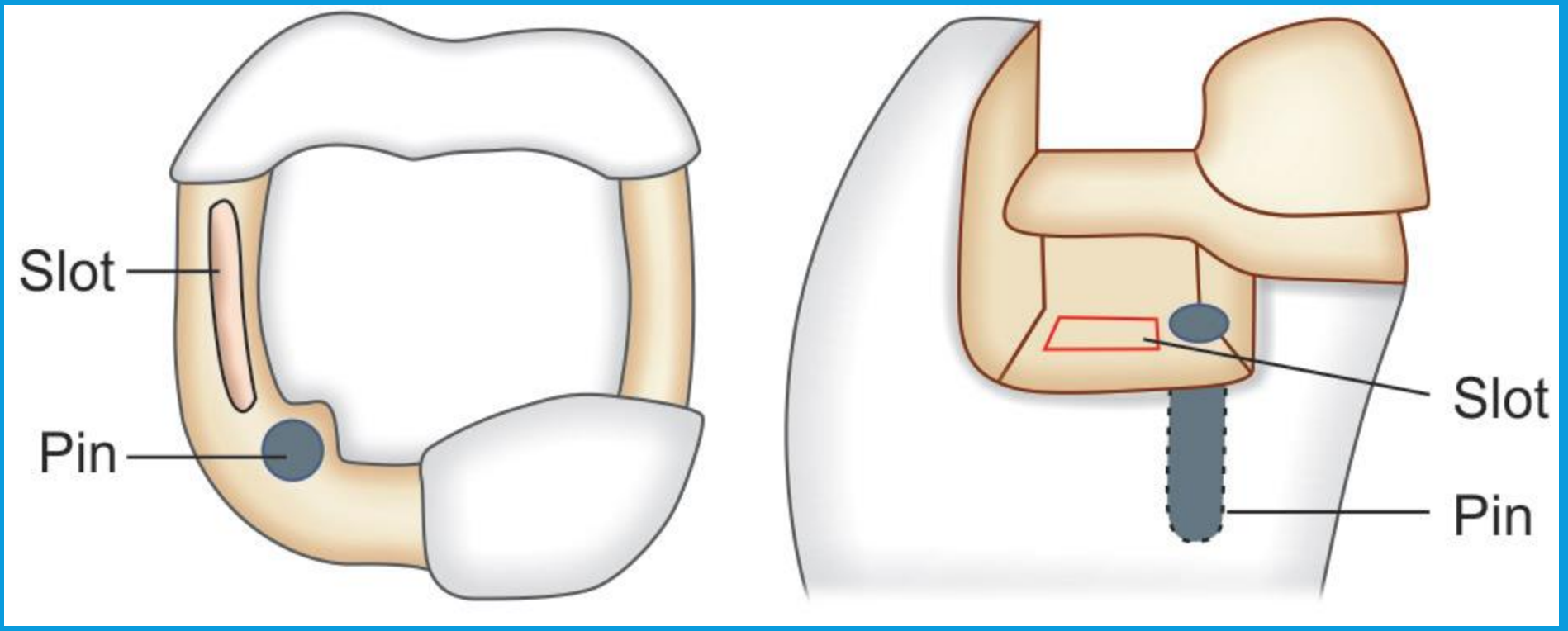


The bevel is to remove unsupported enamel bcz the enamel rods oblique ginigivaly



STEP, AMALGAM PIN AND SLOT

-
- there is limited remaining tooth structure additional secondary features are necessary
- 1- Careful orientation of remaining horizontal and vertical walls results in "steps" that increase retention and resistance
- 2- the retentive holes (for amalgam pins)


Slot
Pin
Slot
Pin

7- FINISHING OF CAVITY WALLS:

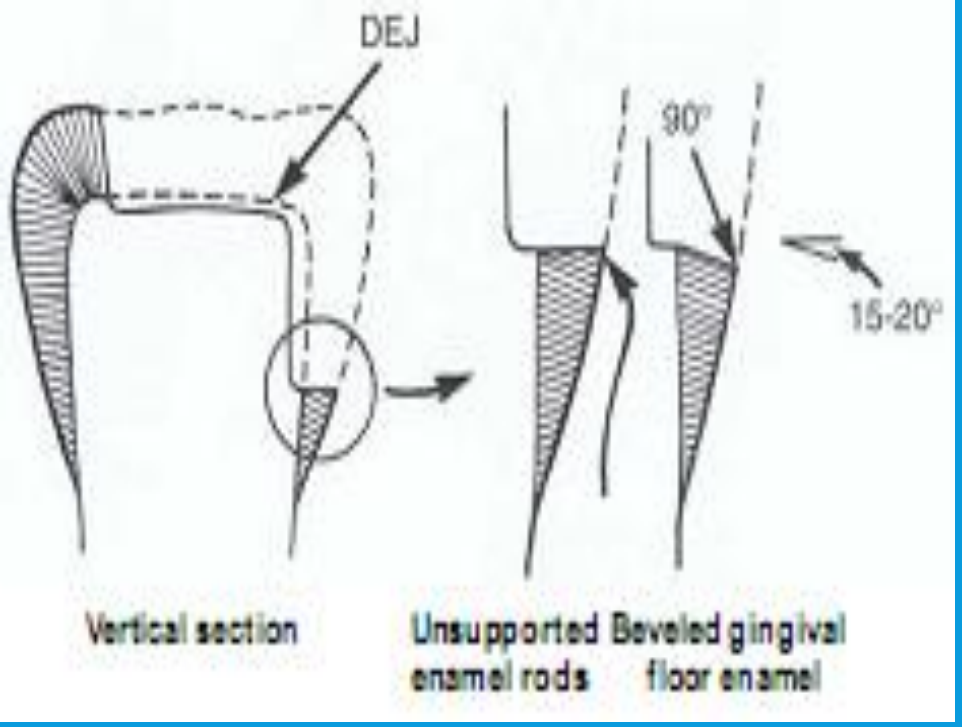
Objectives:

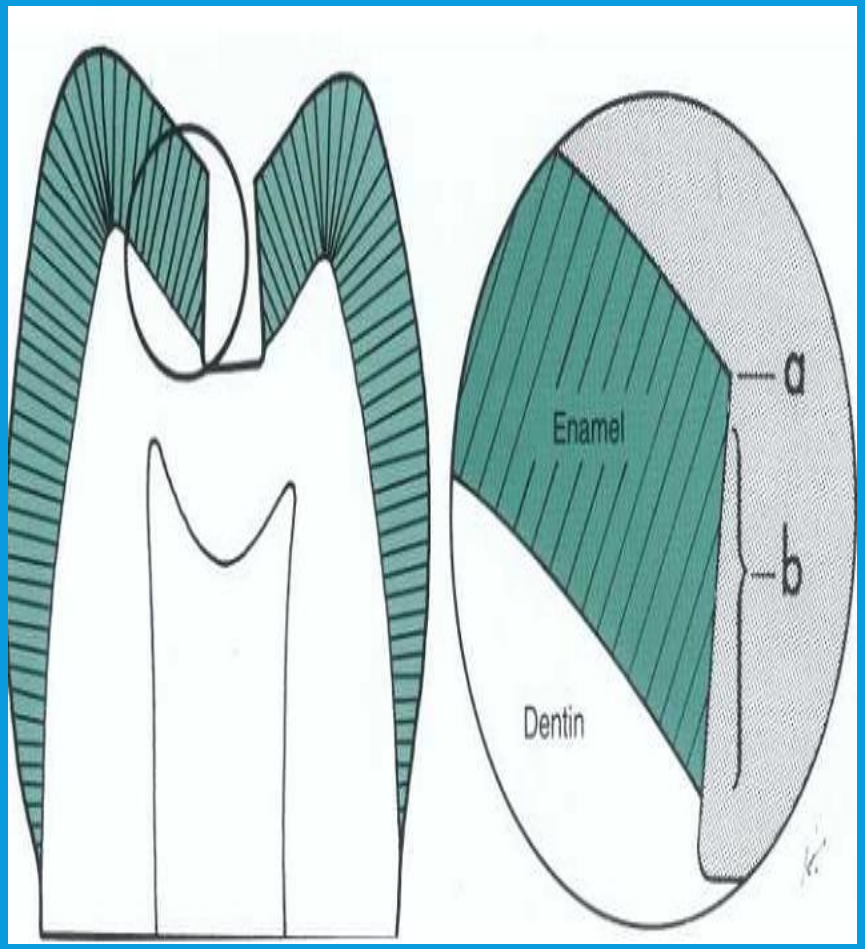
1. Removal of undermined enamel
2. Obtaining the suitable CSA according to the restorative material
3. Having correct cavity walls inclination
4. Smoothening walls and margins for better adaptation
5. Roundation of line and point angle

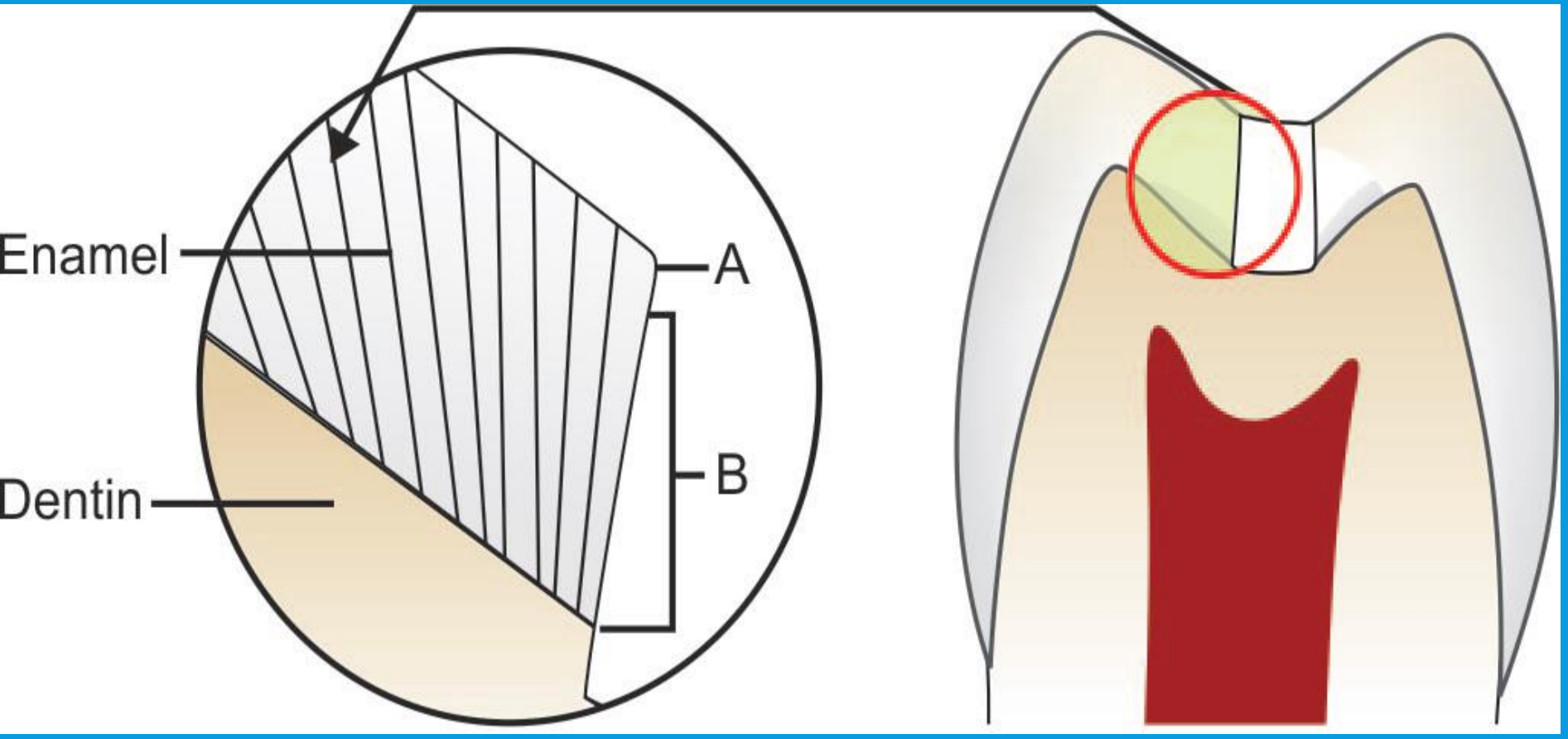
FACTORS AFFECTING CSA

1. Type of restoration
2. Stress acting on cavity margin → Thin restoration applied to the bevel.
3. Location of the margin → out of stress
4. Condition of enamel
5. Esthetic requirements

Gradual variation in color difference btw the restoration and tooth structure.


DEJ
90°
15-20°
Vertical section
Unsupported enamel rods
Beveled gingival floor enamel


Enamel
Dentin
a
b


Enamel
Dentin
A
B

8-TOILET OF THE CAVITY

- Toilet of the cavity is cleaning of the cavity from small chips of cutting tooth structure and carious lesion, using sharp hand instrument to loosen it and washed with air – water spray, cotton pellets then gentle dryness with oil free air.

- CHX cleans the cavity and may increase the bond durability with composite

Thank you for paying attention

Any question ?