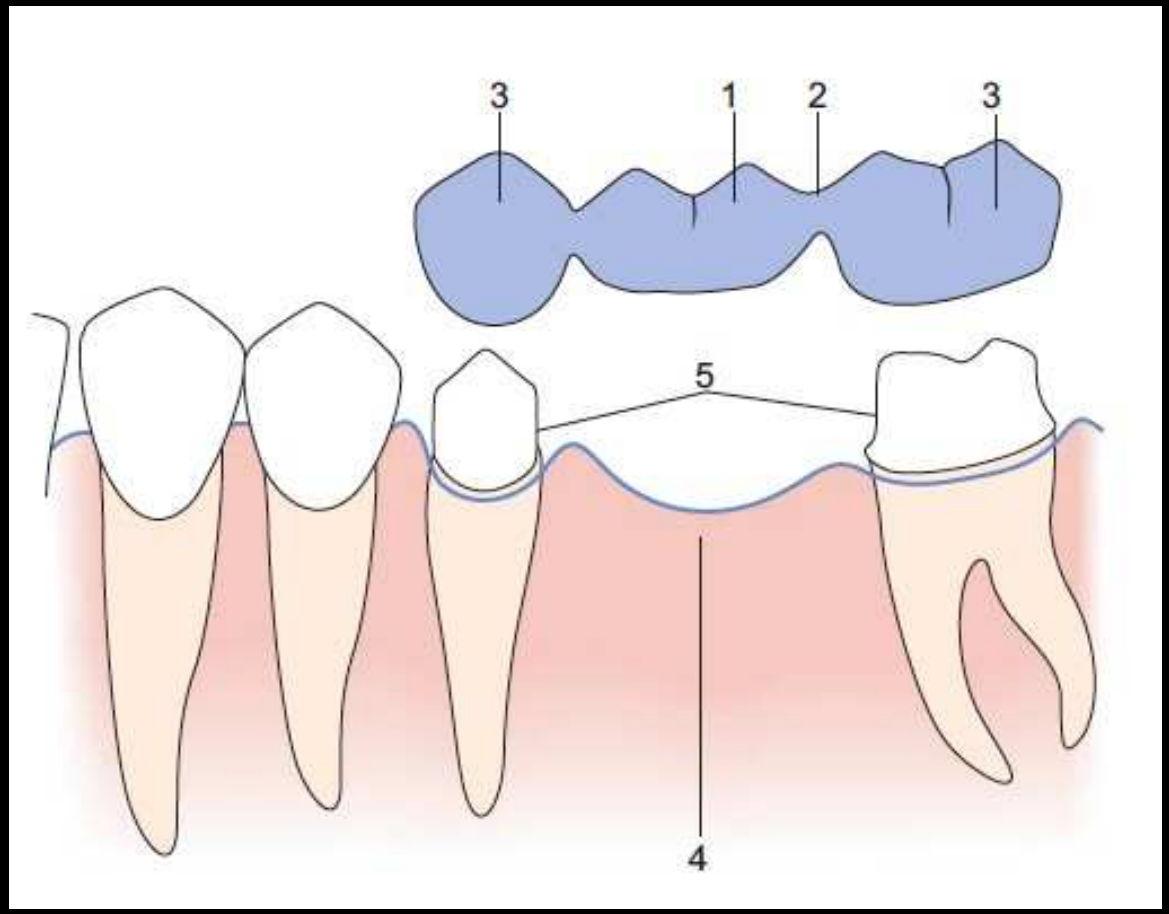
Components of Fixed Dental Prostheses

- 1. Pontic
- 2. Connector
- 3. Retainer



Retainer

- The part of a fixed dental prosthesis that unites the abutment(s) to the remainder of the restoration. (GPT8)
- This is used for the stabilization or retention of prosthesis.
- It is cemented to the abutment.

Classification

- Amount of tooth coverage
- Mechanism of retention
- Material used

Amount of tooth coverage

- Complete coverage or full veneer retainers
- Partial coverage or partial veneer retainers
- Conservative retainers

1. Complete coverage or full veneer retainers

- Cover all the surfaces of the abutment tooth and are ideal retainers as they provide maximum retention.
- Most commonly used retainers for FPDs and are the retainers of choice for extensively damaged abutment teeth

Complete coverage retainers

2. Partial coverage or partial veneer retainers

- Do not involve all the surfaces of the abutment.

- Require less amount of tooth preparation and have superior aesthetics but are less retentive.

2. Partial coverage or partial veneer retainers

Depending on the surface and area covered they are termed as

- three-fourth crown,
- reverse three-fourth crown,
- four-fifth crown,
- seven-eighths,
- one-half crown,
- pinlays and pinledges

7/8th Crown

Proximal 1/2 crown

3. Conservative retainers

- Require minimal tooth preparation and are primarily indicated for anterior teeth.
- They cannot accept heavy occlusal load

egs: Resin-bonded fixed partial dentures

Mechanism of retention

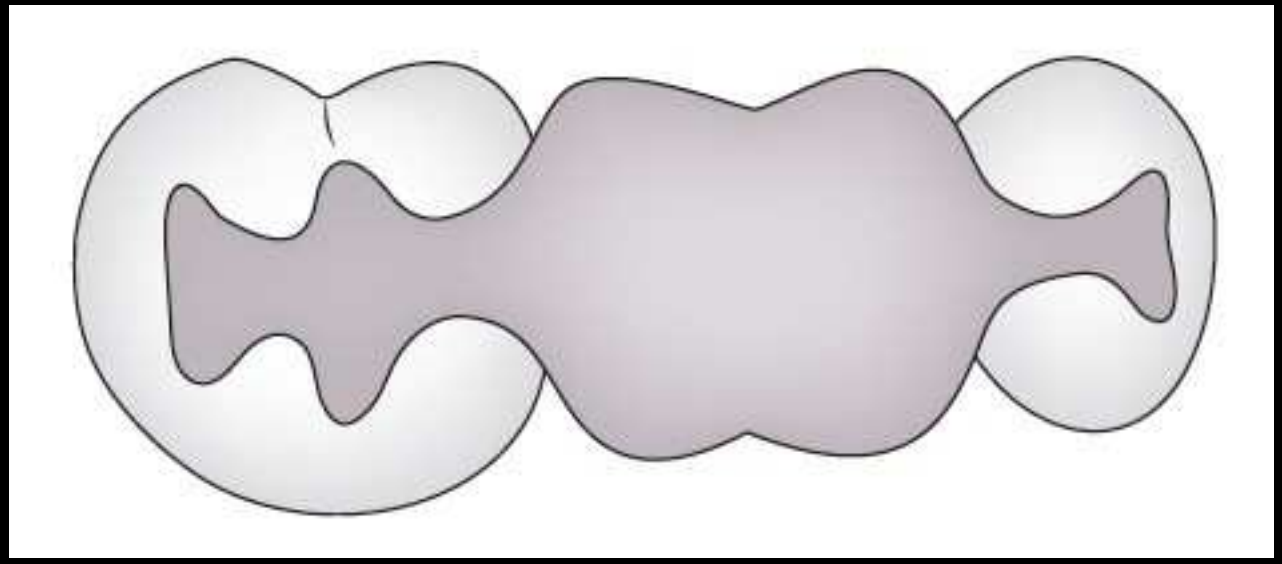
- Extracoronal
- Intracoronal
- Radicular

1. Extracoronal retainers

- Obtain retention from the external surface of the coronal part of the abutment teeth;
- E.g. full veneer crowns and partial veneer crowns.

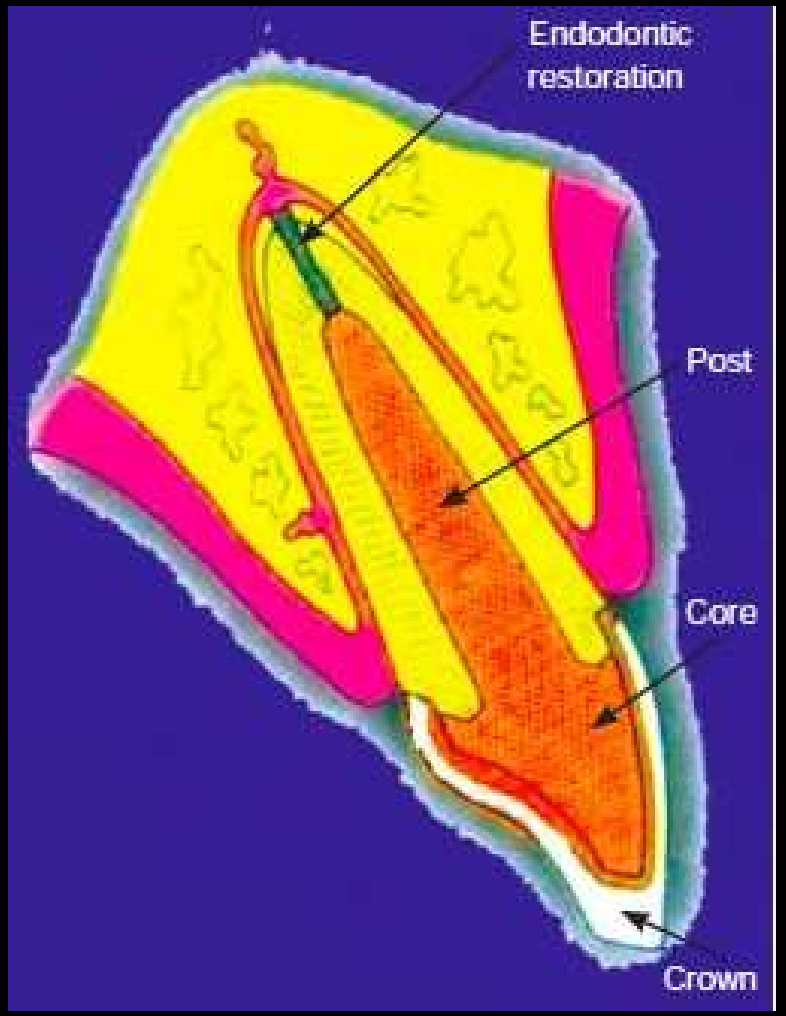
2. Intracoronal retainers

- Obtain retention from within the coronal tooth structure; examples are inlays, onlays



3. Radicular retainers

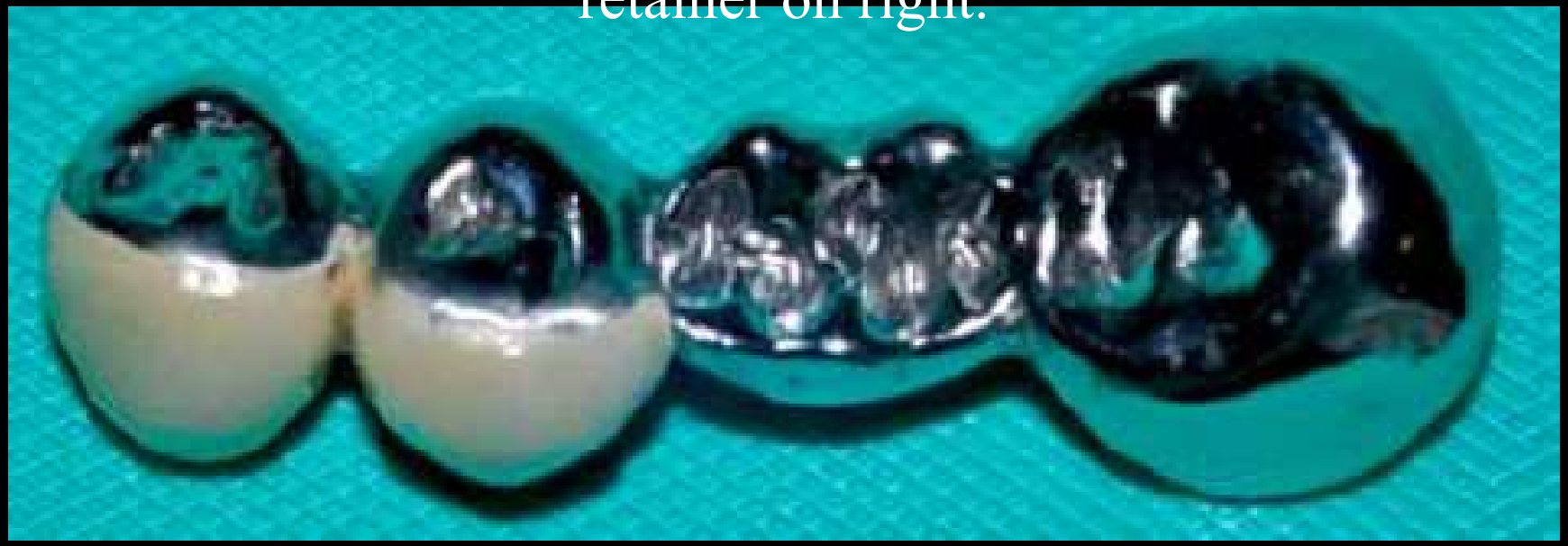
- **Obtain retention from within the root of the abutment.**



Material used

- **All metal –** *Posteriorly used, need minimal tooth prep, have good strength, Used for FVC & PVC*
- **Metal ceramic –** *most common, Used both ant & Post. More tooth prep*
- **All ceramic –** *Most esthetic, Max prep, strength in long span FPDs?*
- **Acrylic –** *Temporary, poor strength, poor colour stability, poor wear resistance, poor tissue response*

Metal with ceramic facing retainer on left and full metal retainer on right.



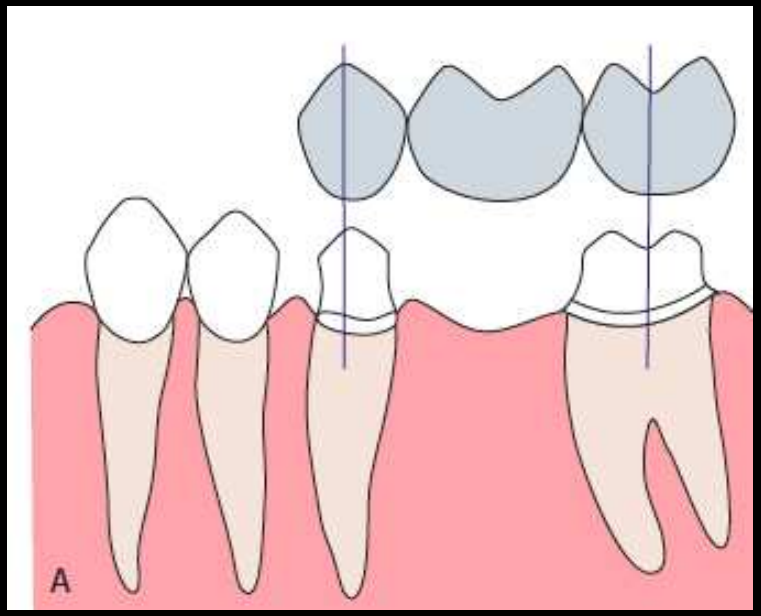
All ceramic retainers

Selection of retainers

- Abutment angulations
- Condition of the Abutment
- Aesthetics
- Preservation of Tooth Structure
- Retention
- Cost

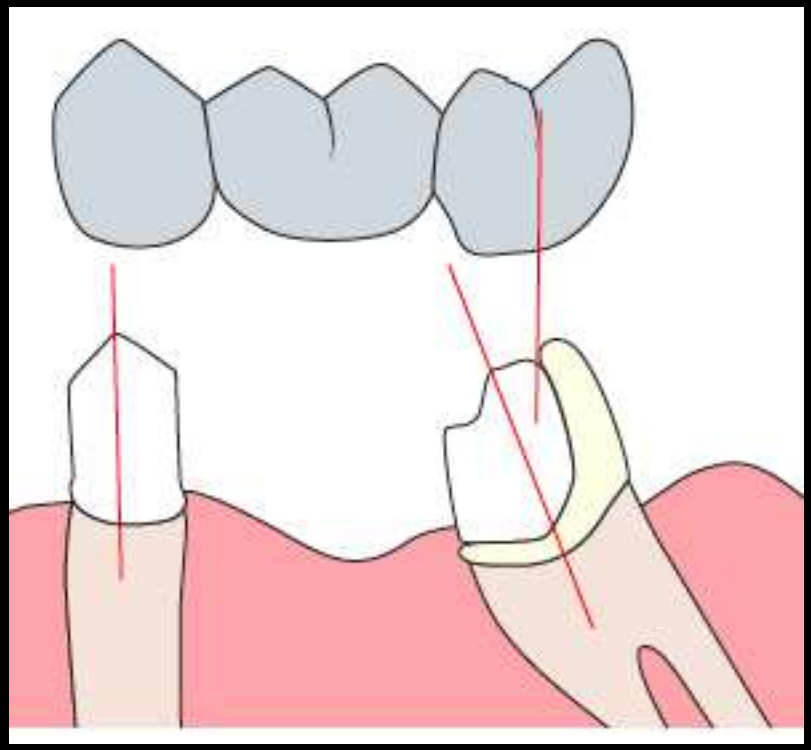
Abutment angulation

- In case the abutments are parallel to each other, a full veneer retainer can be planned and a single path of insertion can be obtained



Abutment angulation

- If the abutments are non-parallel owing to unfavourable tooth positions, a partial veneer retainer along with another partial or full veneer retainer can be used to get a single path of prosthesis insertion



Condition of abutment

- If the abutment teeth are in good health, in terms of both periodontium and caries, a partial veneer retainer can be considered
- In case the abutment is endodontically treated or extensively damaged, a full veneer retainer is recommended.

Aesthetics

- Partial veneer – Better esthetics? thin teeth metal reflected, secondary caries
- Lack of space – FVC manages space, better esthetics

Preservation of Tooth Structure

- PVC more conservative than FVC
- But longevity should not be compromised
- Etched cast retainers can be thought of a conservative alternative

Retention

- A molar exerts more force when compared to a premolar, thus it requires more retention.
- Longer the span, greater is the retention required.
- In both cases full coverage retainers offer better retention.

Cost

- Full veneer all ceramic retainers are recommended in cases of anterior tooth replacements. But they are more expensive than metal-ceramic and facing retainers.

- If cost is a factor, metal ceramic restorations can be considered for anterior region and all metal restorations for posteriors.

The complete cast crown

Has the best longevity of all fixed restorations

Advantages

1) Greater retention

2) Greater resistance form

3) Strength

4) Modification of axial tooth contour
   -special significance when dealing with malaligned teeth
   -better access to improved oral hygiene

5) special requirements

-when retainers are needed for RPD

6) Easy occlusal modifications

-imp in supra erupted teeth

Disadvantages

1) Extensive removal of tooth structure
2) Adverse effects on soft tissue
3) Vitality tests not feasible
4) Display of metal

Indications

1) Extensive coronal destructive by caries or trauma
2) Endodontically treated teeth
3) More conservative treatment non feasible
4) To provide support to a removable partial denture
5) Correction of occlusal plane

contraindications

1) When conservative treatment can be carried out

2) If intact buccal or lingual wall exists

3) If less than maximum retention and resistance are needed

4) High esthetic needs

- ***The metal ceramic crown***
- ***Indications,***
- Teeth that require complete coverage with significant esthetic demands.
- Retainer for fixed partial denture.
- To accommodate a rest for a removable prosthesis.
- Extensive tooth destruction as a result of caries.
- Existing previous restorations that precludes the use of a more conservative restoration.
- Need for superior retention and strength.
- Endodontically treated tooth.
- Need to recontour axial surfaces or correct minor malinclinations.

- ***Indications,***
- To support posterior teeth that have lost moderate amounts of tooth structure, provided the buccal wall is intact and well supported by sound tooth structure.
- Retainers for a fixed partial denture.
- Anterior partial veneers can be used retainers, to reestablish anterior guidance, and to splint teeth.
- Suitable for teeth with sufficient bulk.

- ***Contraindications,***
- On short clinical crowns
- As retainers for long span FPDs
- Rarely suitable for endodontically treated teeth
- Active caries or periodontal diseases.
- Poorly aligned teeth
- Should not be placed on teeth that are proximally bulbous. (unsupported enamel).
- Difficult to prepare adequate grooves on thin teeth of restricted faciolingual dimension.

- ***Advantages,***
- Conservation of tooth structure.
- Reduced pulpal and periodontal insult during tooth preparation.
- Access to supragingival margin is easy.
- Allows the operator to perform selected finishing procedures that are more difficult with complete coverage restorations.
- Better access for oral hygiene maintainance.

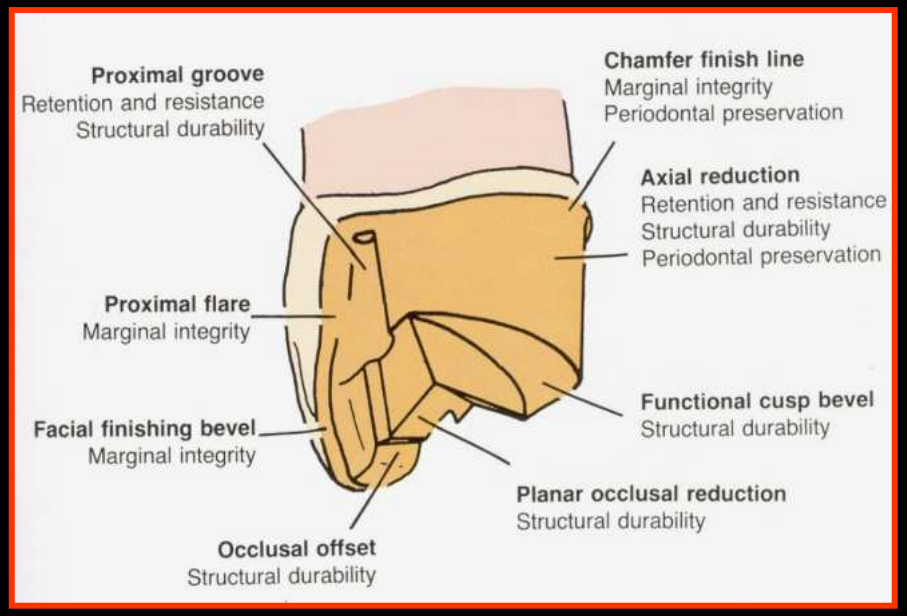
- During cementation, the luting agent can escape more easily, which produces relative good seating of the restoration.
- Because of Direct visibility, verification of seating and cement removal are simple.
- Permits electric vitality testing.

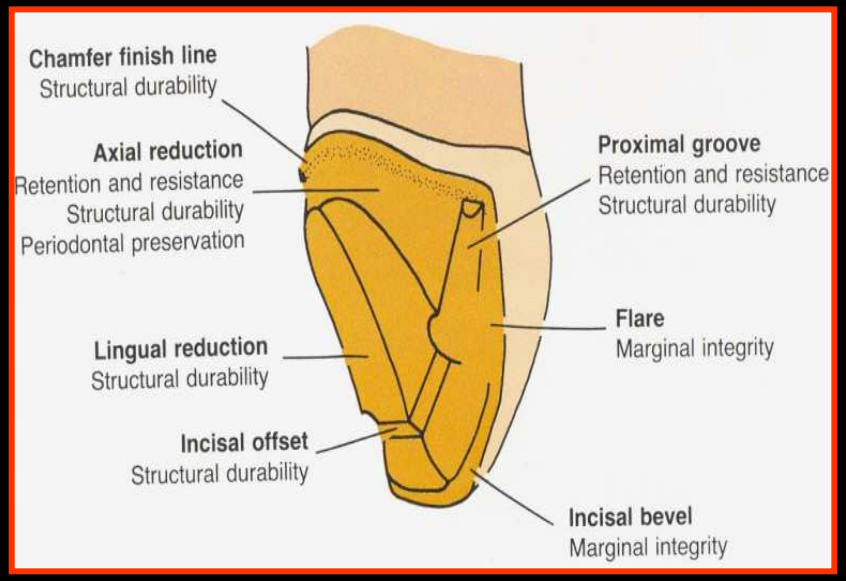
- ***Disadvantages,***

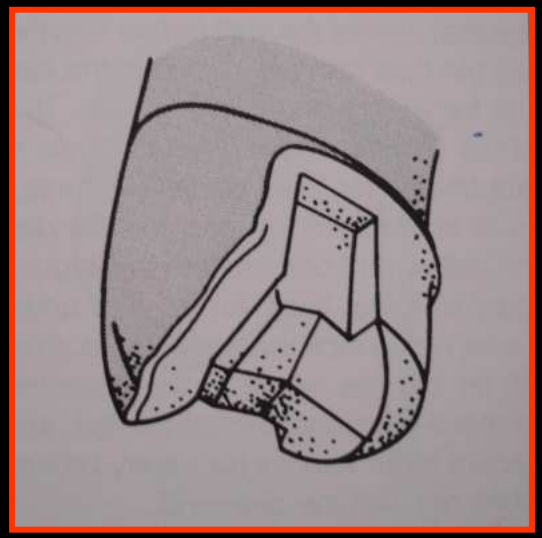
- Less retention and resistance
- Preparation is difficult, primarily because only limited adjustments can be made in the path of withdrawal
- Placement of grooves, boxes and pinholes requires dexterity from the operator.
- Display of metal

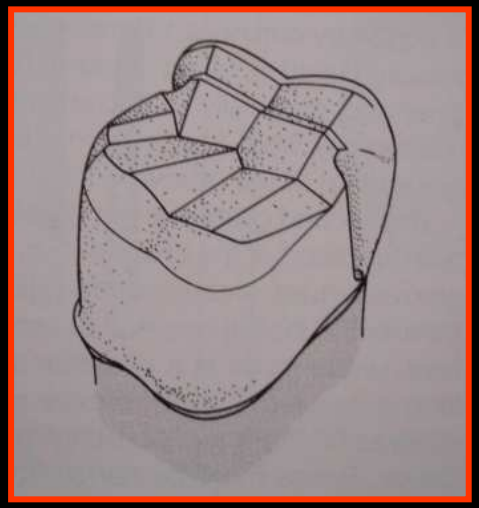
- ***Pinledge restorations,***

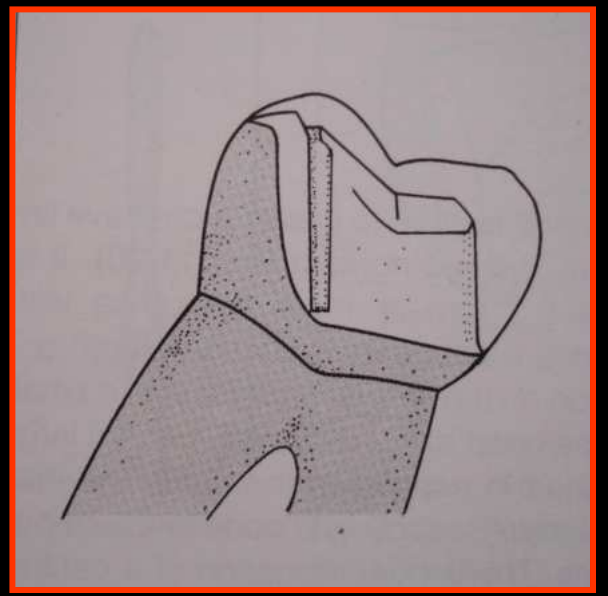
  - has the greatest potential for optimal esthetics
  - preservation of facial enamel
  - retention comes from three or more pins
  - resistance form is provided by indentations and ledges
  - involves less than 50% of the coronal area of the tooth, twisting or rotational forces
  - pin ledge must be cast from a type IV gold or an alloy


Proximal groove
Retention and resistance
Structural durability
Chamfer finish line
Marginal integrity
Periodontal preservation
Axial reduction
Retention and resistance
Structural durability
Periodontal preservation
Proximal flare
Marginal integrity
Facial finishing bevel
Marginal integrity
Functional cusp bevel
Structural durability
Planar occlusal reduction
Structural durability
Occlusal offset
Structural durability


Chamfer finish line
Structural durability
Axial reduction
Retention and resistance
Structural durability
Periodontal preservation
Proximal groove
Retention and resistance
Structural durability
Flare
Marginal integrity
Lingual reduction
Structural durability
Incisal offset
Structural durability
Incisal bevel
Marginal integrity







- ***Indications,***
- Undamaged anterior teeth in dentitions with a low caries experience.
- High esthetic requirement
- On bulbous teeth that are unsuitable for three quarter crowns
- The lingual concavity of a maxillary anterior tooth can be modified successfully with a pinledge restoration to establish the desired anterior guidance.

- ***Contraindications,***
- Poor oral hygiene or high caries index
- Young patients with large pulp chambers
- Teeth that are thin labiolingually
- When the alignment of the abutment will conflict with the proposed path of withdrawal
- When optimum retention is required.

- ***Advantages,***
- Minimal tooth structure
- Supragingival finish margins
- Highly esthetic restorations
- Plaque control after treatment is easier because of short margin length and largely supragingival margin location
- On bulbous tooth that are unsuitable for three quarter crowns

- ***Disadvantages,***
- Pinledges are not as retentive as their less conservative counterpart.
- Though a simple design, should be executed with greater than average skill and care.
- Can not be used when optimum retention is required.

- ***Intracoronal restorations,***
- Intracoronal inlay is the simplest of the cast restorations and has been used for the restoration of occlusal, gingival, and proximal lesions.
- They utilize wedge retention, which exerts some outward pressure on tooth.
- Inlay simply replaces missing tooth structure without doing anything to reinforce that which remains.
- Recommended isthmus width is ***one fourth*** the intercuspal distance.

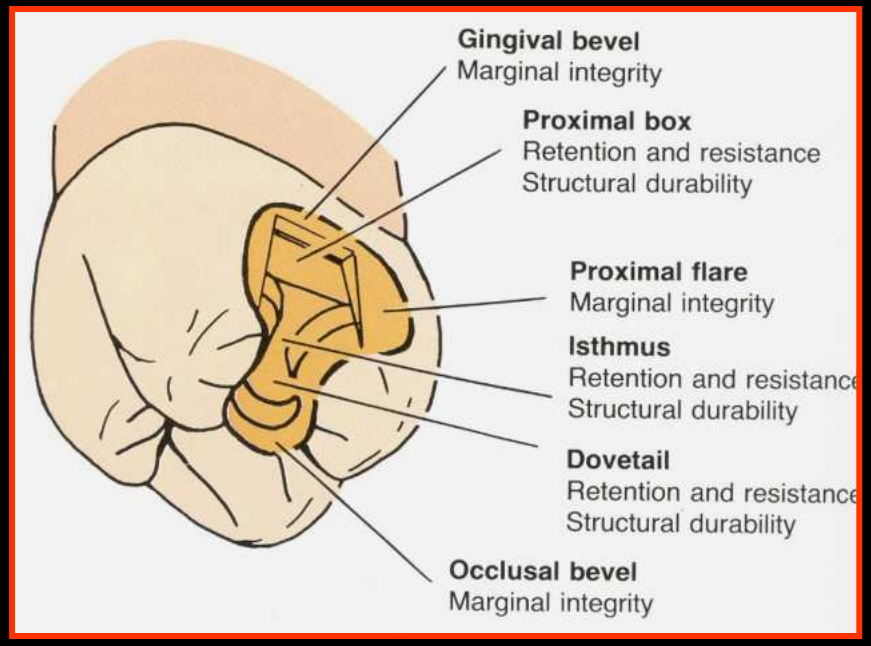
- ***Indications,***
- Almost same as for amalgam restorations.
- Should be considered in the restoration of a severely worn dentition when the teeth are otherwise minimally damaged.
- Replacement of an MOD amalgam restoration when sufficient tooth structure remains for retention and resistance form.

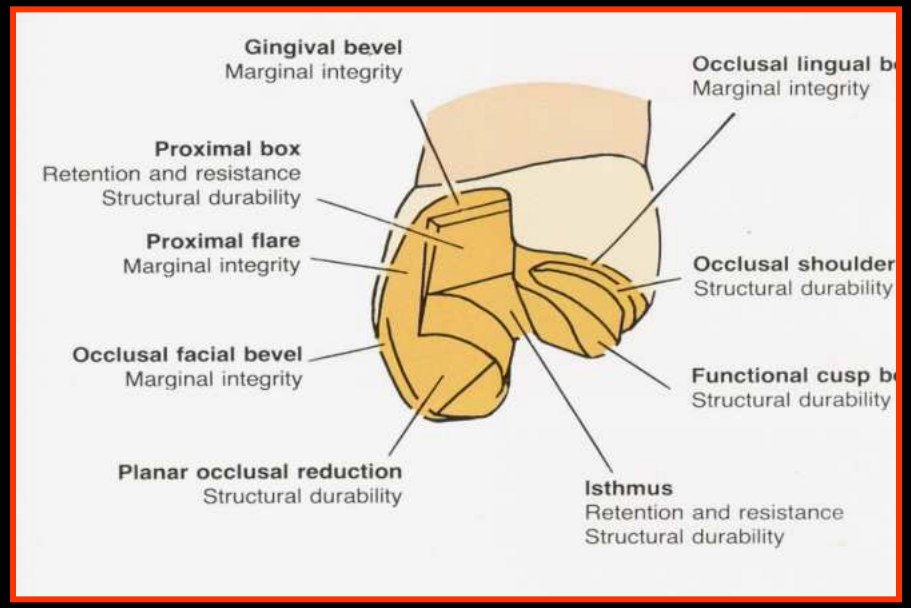
- ***Contraindications,***
- Contraindicated unless there is sufficient bulk to provide resistance and retention form.
- MOD inlays may increase the risk of cusp fracture and are generally not recommended.
- Extensive onlays, required where caries or existing restorations extend beyond the facial or lingual line angles, are contraindicated unless pins are used to supplement retention and resistance.

- ***Advantages,***
- Least complicated cast restorations to make and can be very durable when it is carefully done.
- An onlay allows the damaged occlusal surface to be restored with a casting in the more conservative manner.
- Extremely long lived restoration because of the excellent mechanical properties of the gold alloy.

- Low creep and corrosion mean that if inlay or onlay margins are accurately cast and finished, they will not deteriorate.
- Lack of corrosion may be an esthetic advantage.
- No tooth discoloration.
- Onlay can support cusps, reducing the risk of tooth fracture.

- ***Disadvantages,***
- In the restoration of a small carious lesion, an inlay is not conservative of tooth structure.
- Additional tooth removal is necessary after minimal proximal extension.
- This extension may lead to additional display of metal and gingival encroachment.
- Inlays relay on the bulk of the buccal and lingual cusps for resistance and retention form.
- High occlusal force will lesd to cusp fracture due to wedging of the inlay.


Gingival bevel
Marginal integrity
Proximal box
Retention and resistance
Structural durability
Proximal flare
Marginal integrity
Isthmus
Retention and resistance
Structural durability
Dovetail
Retention and resistance
Structural durability
Occlusal bevel
Marginal integrity


Gingival bevel
Marginal integrity
Occlusal lingual b
Marginal integrity
Proximal box
Retention and resistance
Structural durability
Proximal flare
Marginal integrity
Occlusal shoulder
Structural durability
Occlusal facial bevel
Marginal integrity
Functional cusp b
Structural durability
Planar occlusal reduction
Structural durability
Isthmus
Retention and resistance
Structural durability

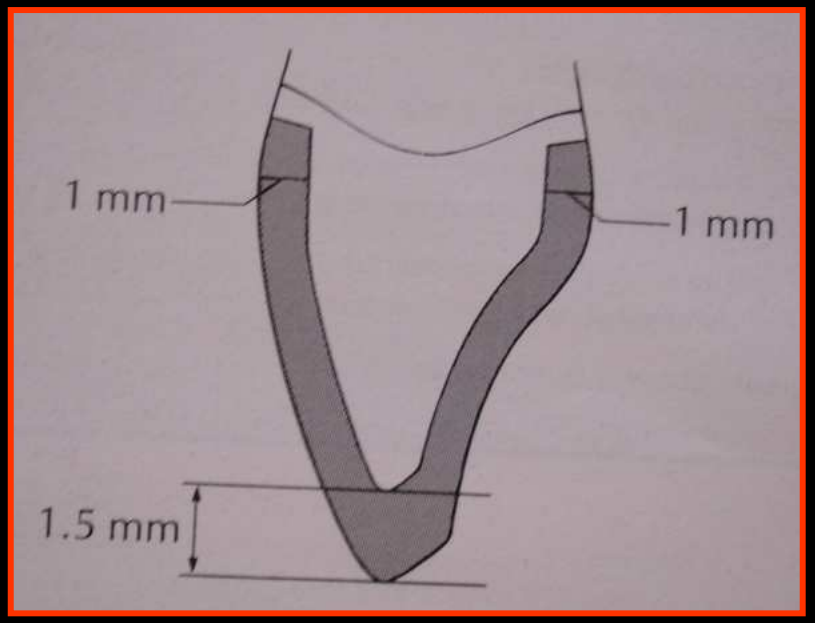
- ***All ceramic restorations,***
- Most esthetically pleasing restorations.
- ***Indications,***
- Areas with high esthetic requirement where a more conservative restoration would be inadequate.
- tooth should be relatively intact with sufficient coronal structure to support.
- Occlusal load should be favorably distributed.

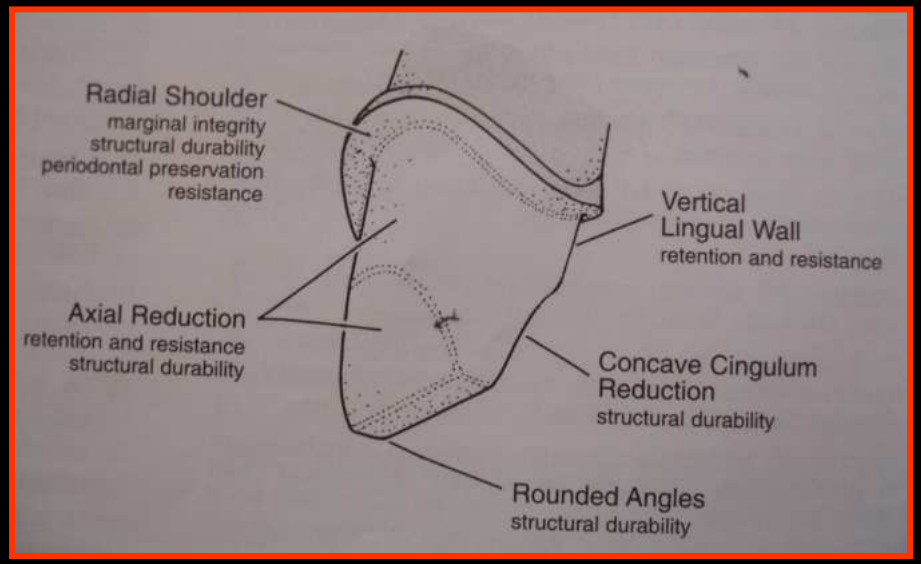
- ***Contraindications,***
- When a more conservative restoration can be used.
- Usually they are not recommended for posterior teeth.
- Unfavorable occlusal loading.
- If it is not possible to produce adequate support or an even shoulder width of at least 1mm circumferentially.
- Para functional habits.

- ***Advantages,***
- Superior esthetics.
- Excellent translucency.
- Generally good tissue response.
- More conservative reduction of the facial surface.
- Appearance pf the completed restoration can be influenced and modified by selecting different colors of luting agent.

- ***Disadvantages,***
- Reduced strength of the restoration.
- Significant tooth reduction on proximal and lingual sides. (shoulder margin)
- Difficulties may be associated with obtaining a well fitting margin.
- Inadequate tooth preparation- fracture.
- Proper preparation design is critical to ensuring mechanical success.
- Severely damaged tooth can not be restored.

- Not effective as retainers for FPDs.
- Requires connectors of large cross sectional dimension which may impinge on the interdental papilla.
- Wear has been observed on the functional surfaces of natural teeth that oppose porcelain restoration.


1 mm
1 mm
1.5 mm


Radial Shoulder
marginal integrity
structural durability
periodontal preservation
resistance
Vertical
Lingual Wall
retention and resistance
Axial Reduction
retention and resistance
structural durability
Concave Cingulum
Reduction
structural durability
Rounded Angles
structural durability

- ***Resin retained fixed partial dentures,***

  •A fixed dental prosthesis that is luted to tooth structures, primarily enamel, which has been etched to provide mechanical retention for the resin cement

  Rochette in 1973

  •Primary goal of resin retained FPD is the replacement of missing teeth and maximum conservation of tooth structure.

- ***Indications,***
- Replacement of missing anterior teeth in children and adolescents.
- Short span.
- Unrestored abutments.
- Single posterior teeth.
- Significant crown length.
- Excellent moisture control.

- ***Contraindications,***
- Parafunctional habits.
- Long edentulous span.
- Restored or damaged abutments.
- Compromised abutments.
- Significant pontic width discrepancy.
- Deep vertical overlap.
- Nickel allergy.

- ***Advantages,***
- Minimal removal of tooth structure.
- Minimal potential for pulp trauma.
- Anesthesia not usually required.
- Supragingival preparation.
- Easy impression making.
- Provisional not usually required.
- Reduced chair time.
- Reduced patient expense.
- Rebond possible.

- ***Disadvantages,***
- Reduced restoration longevity
- Enamel modifications are required.
- Space correction is difficult.
- Good alignment of abutment teeth is required.
- Esthetics is compromised in posterior teeth.