# Crown & Bridge

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## ALL-CERAMIC RESTORATION

Most Esthetically pleasant prosthodontic restorations. Because there is no metal to block light transmission, they can resemble natural tooth structure better in terms of color and translucency than any other restorative option.

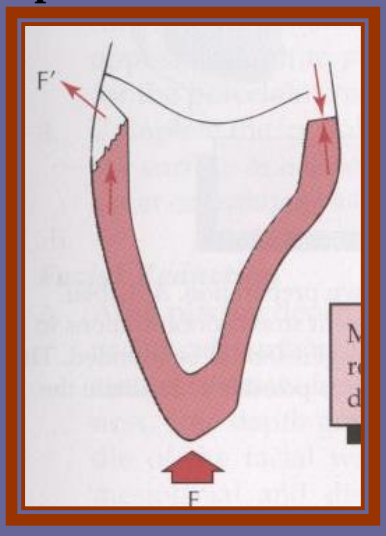
Their chief disadvantage is their susceptibility to fracture, although this is lessened by use of the resin– bonded technique.

Differ from other cemented crowns because it is not cast in gold or other metal. It is capable of producing the best cosmetic effect of all dental restorations. However, since it made entirely of ceramic which is a brittle substance (more susceptible to fracture).

### Complete Ceramic Crowns:-

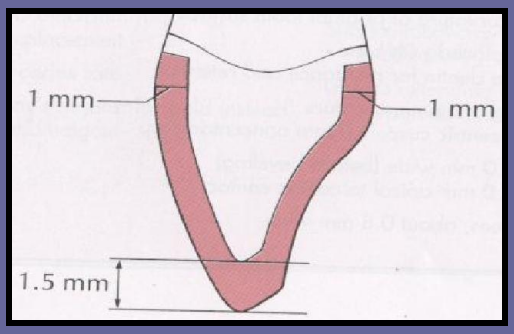
Preparation design of this type should give maximum support to the porcelain.

### Design features that give maximum support to the porcelain.




- Preparations should be left as long as possible. An over-shortened preparation will create stress concentrations in the labiogingival area of the crown, which can produce a characteristic ‘half –moon’ fracture in the labiogingival area of the restoration.

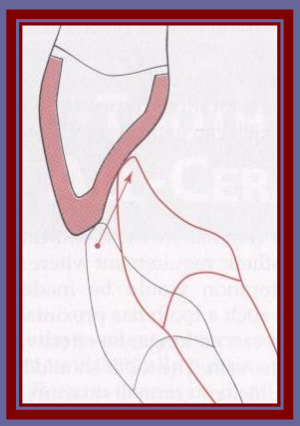
- A shoulder of uniform width 1 mm is used as gingival finish line to provide a flat seat to resist forces directed from the incisal. A 90-degree shoulder (cavosurface angle) is needed to prevent unfavorable distribution of stresses.




- The incisal edge is flat and placed at a slight inclination toward the linguogingival to withstand the forces on the incisal edge and prevent shearing.

- Wear has been observed on the functional surfaces of natural teeth that oppose porcelain restorations. This also applies to teeth opposed by metal-ceramic restorations, especially the mandibular incisors, which can exhibit significant wear over time.

- The tooth should be relatively intact with sufficient coronal structure to support the restoration, particularly in the incisal area, where it is important not to exceed a maximum porcelain thickness of 2 mm; otherwise, brittle failure of the material will occur. Because of the relative weakness of the restoration, the occlusal load should be favorably distributed. Generally this means that centric contact must be in an area where the porcelain is supported by tooth structure (e.g., in the middle third of the lingual wall).



- All sharp angles of the preparation-should be rounded to reduce the danger of fracture caused by points of stress concentration.

## Advantage:-

- Superior esthetics, excellent translucency.
- Good tissue response.
- Labially more conservative than metal –ceramic crown ( lack of reinforcement by a metal substructure permits slightly more conservative reduction of the facial surface than is possible with the metal –ceramic crown , although the lingual surface needs additional reduction for strength)
- The appearance of the complete restoration can be influenced and modified by selecting different colors of luting agent.

## Disadvantages:-

1- Reduced strength due to absence of reinforcing metal substructure.

2- Because of the need for a shoulder type margin circumferentially, significant tooth reduction is necessary on the proximal and lingual aspects. Porcelain brittleness, when combined with the lack of a reinforcing substructure, requires a circumferential support with a shoulder. Thus, by comparison, the proximal and lingual reductions are less conservative than those needed for a metal- ceramic crown.

3- Remember the "Un forgiving" nature of porcelain if an inadequate tooth preparation goes uncorrected, can result in fracture

4- All –ceramic crowns are not effective as retainers for a fixed partial denture.

## INDICATION:

- High esthetic requirement
- Considerable proximal or facial caries, that no longer be effectively restored with composite resin.
- Relatively intact incisal edge. Thickness of porcelain should not exceed 2mm; otherwise, brittle failure of the material will occur.
- Favorable distribution of occlusal load. Centric contacts are best confined to the middle third of the lingual surface, leaving the crown out of contact is not recommended, future eruption may lead to protrusive interference, which results in fracture.

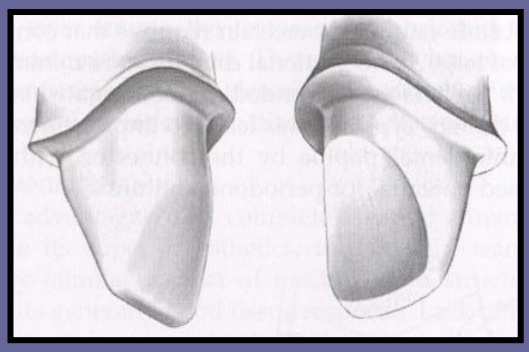
## CONTRAINDICATION

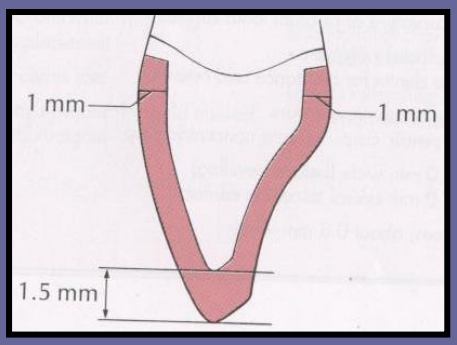
- In molar rarely we use all ceramic crowns because the increased occlusal load and the reduced esthetic demand make metal-ceramic crown the treatment of choice.
- Teeth with short clinical crown don't have enough preparation length to support the lingual and incisal surface of the restoration.
- Thin teeth faciolingually.
- Bruxism
- Should be avoided on teeth with an edge-to-edge occlusion that will produce stress in the incisal area of the restoration, also it should not be used when the opposing teeth occludes on the cervical fifth of the lingual surface tension will produced half-moon fracture

## PREPARATION:

The preparation sequence for a ceramic crown is similar to that for a metal-ceramic crown; the principle difference is the need for a 1-mm-wide shoulder circumferentially.

- All-ceramic crown made over shoulder finish line exhibit greater strength than those made over chamfer.
- Care must be taken not to create undercuts in the axial walls where they join the shoulder.





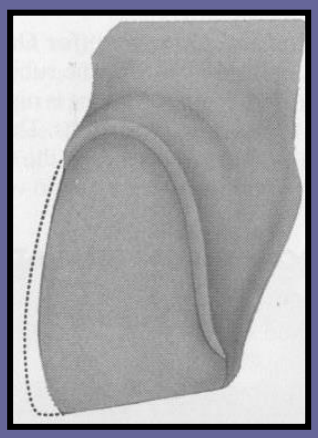

## Porcelain laminates veneers

It consists of thin shell of porcelain applied directly to tooth structure; it is a conservative method of restoring the appearance of discolored, pitted, or fractured anterior teeth. It consists of bonding thin ceramic laminates onto the labial surfaces of affected teeth.

**Indications for Veneer Placement**

Veneers can be used for functional and cosmetic correction of the following conditions:

1. Stained or darkened teeth
2. Hypocalcification
3. Multiple diastemas
4. Peg laterals
5. Chipped teeth
6. Lingual positioned teeth
7. Malposed teeth not requiring orthodontics



***Contraindications for Veneer Placement Include:***

1. Insufficient tooth substrate (enamel for bonding)
2. Labial version
3. Excessive interdental spacing
4. Poor oral hygiene or caries
5. Parafunctional habits (clenching, bruxism)
6. Moderate to severe malposition or crowding

## Advantages:

- The main advantage of facial veneers is that they are conservative of tooth structure. Typically only about 0.5 mm of facial reduction is needed. Since this is confined to the enamel layer, local anesthesia is not usually required.
- Wear and stain resistance.
- Have largely replaced M-C-crowns for the treatment of multiple discolored but otherwise sound teeth.

## Disadvantage

- Increase tooth contour.
- The main disadvantage is the difficulty in obtaining restoration that is not excessively contoured.

# Preparation:-

### Preparation is minimal and remaining within enamel,

### Step –by- step procedures:

The gingival third and proximal line angles are often over contoured with these restorations. Therefore, maximum reduction should be achieved with minimum penetration into the dentin.

1- Make a series of depth holes with a round bur, the required amount of reduction will depend on the extent of discoloration. A minimum of 0.5mm is usually adequate. The reduction should follow the anatomic contours of the tooth. Due to the relatively thin enamel in the gingival half of the labial surface of most anterior teeth, the desired reduction in that area is 0.3 mm. the minimal thickness for a porcelain laminate veneer is 0.3 to 0.5 mm.

2- The finish line should be a slight chamfer (long chamfer) placed within enamel at the level of the gingival crest or slightly subgingival . This design has an obtuse cavosurface angle which exposes the enamel prism ends at the margin for better etching.

3- Wherever possible, place the preparation margin labial to the proximal contact area to preserve it in enamel. Sometimes the proximal margins are extended lingually to include existing restoration. When multiple adjacent teeth are prepared for veneers, the contacts should be opened to facilitate separation of the dies without damaging the interproximal finish line.

4- If possible, do not reduce the incisal edge, this helps support the porcelain and makes chipping less likely.

- If the incisal edge length is to be increased, the preparation should extend to the lingual, care is taken to avoid undercuts with this modification. This design will place the porcelain in compression, extension onto the lingual surface will enhance mechanical retention and increase the surface area for bonding.

5- To prevent areas of stress concentration in the porcelain, be sure that all prepared surfaces are rounded.

## Types of Veneer Preparation

### A. *Incisal Chamfer Preparation (Interlock prep)*

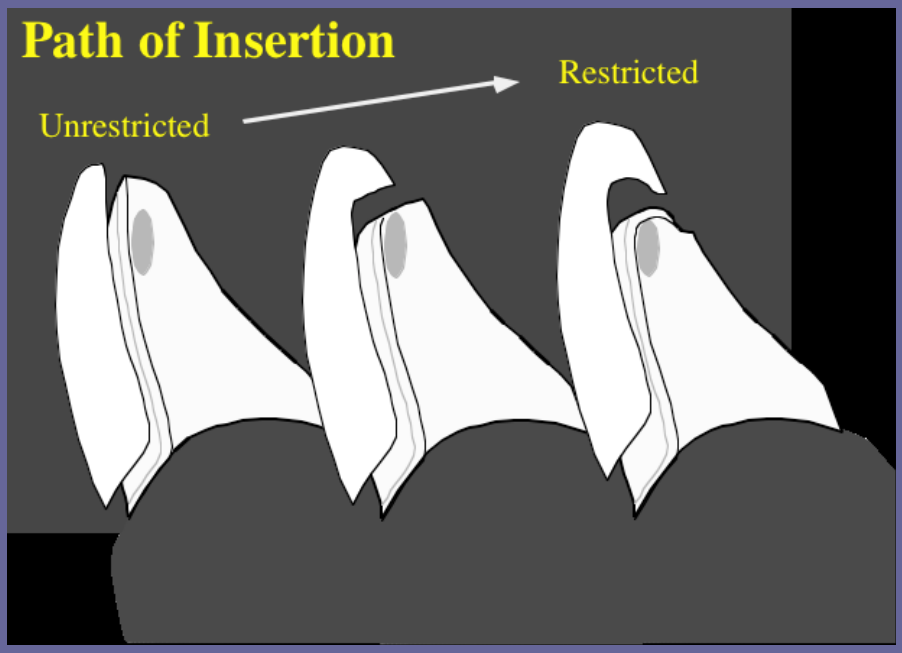
The incisal edge is not reduced in length. This type of preparation is done in order to preserve the natural guiding palatal surface of the tooth, which is important functionally.
Add an additional space for the incisal porcelain by creating a chamfer along the facial incisal margin using the tip of a
tapered diamond.

### B. *Incisal Butt-Joint Preparation*

Prepare 0.5 mm depth cut grooves in the incisal edge. Using the tapered diamond remove the remaining incisal tooth structure. Then round the facial incisal line angle leaving a butt-joint margin along the lingual incisal edge. The incisal reduction should be 0.5 mm-1.0 mm. This type of preparation is done in order to increase the length of the tooth. The length can be increased from 0.5 to 2mm only.

### C. *Incisal Lingual Wrap Preparation*

Prepare 0.5 mm depth cuts in the incisal surface of tooth. Reduce the incisal surface in a manner similar to incisal butt-joint preparation. Reduce the mesial incisal and the distal incisal corners an additional 0.5 mm. Then using a diamond bur, extend the incisal chamfer to the palatal surface. This palatal chamfer should be a straight line mesial to distal. All incisal edges should be rounded. The lingual chamfer line on the wraparound preparation should be above or under the centric lingual contacts to avoid occlusal contact on the interface between porcelain and tooth structure. Contact should be either all on porcelain or on tooth structure. The incisal wrap prep is a popular option for several reasons. It can be used in most patients, easily fabricated by the technician and easily handled by the dentist due to positive seating on delivery.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