All ceramic Crown

Advantages:

1. Superior esthetic.
2. Good tissue response even for subgingival margins.
3. Slightly more conservative of facial wall.
4. Can be used as single restoration only.
5. Favorable distribution of occlusal load

Disadvantages:

1- Reduced strength compared to PFM.
2- Among the least conservative preparations.
3- Britle nature of the material.

Indications:

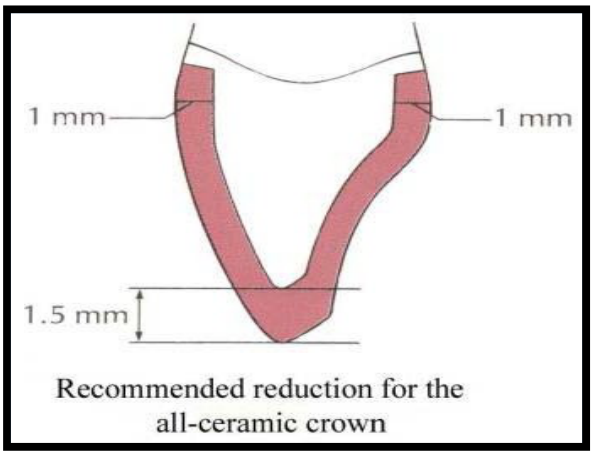
1. High esthetic requirements.
2. Considerable proximal caries.
3. Endodontically treated teeth with post & core.

Contra-Indications:

1- When superior strength required & PFM more appropriate.
2- Thin teeth faciolingually.
3- Unfavorable distribution of occlusal load.
4- Insufficent coronal tooth structure for support. (Very short teeth)
4-Edge to edge occlusion.
5-Bruxism

Tooth Preparation:

Recommended dimensions



Recommended reduction for the all-ceramic crown

Preparation requirements:

1. The preparation must be as long as possible to give support to porcelain.

*Short prep = stress concentration in lingual area = fracture in this area.

2. A shoulder of uniform width (1mm) is used as gingival to provide a flat seat to resist force directed from incisal.

3. Incisal edge is flat and should prepared with slight inclination toward the lingual.

*for the lower tooth = labial inclination.

4. All sharp angles of preparation should be slightly rounded to reduce stress concentration.

5. It should be avoided on teeth with edge to edge occlusal

Steps in preparation:

Prior to tooth reduction a silicon index is constructed.

1. Incisal Reduction:

Complete reduction of incisal edge should provide 1.5-2mm of clearance for porcelain in all mandibular movements. Flat-end taper diamond bur is used, placed parallel to the incisal inclination.

A. Depth orientation grooves 1.5mm in depth are made on the incisal edge using a flat end taper diamond bur, parallel to the incisal inclination of the prepared incisal edge.

B. Any tooth structure between D.O.G should be removed using the same bur at the same angle.

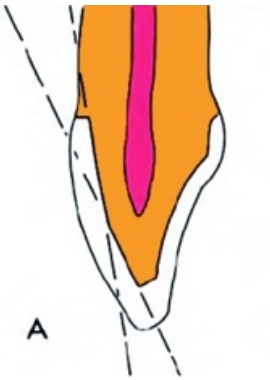
C. Incisal clearance then checks in centric & eccentric occlusal relations.

2. Labial Reduction:
Two planes reduction

Because of the anatomy of the tooth labially it should be reduced in two planes corresponding to the two geometric planes of the labial surface gingival plane and incisal plane.

Incisal plan:
1. Three D.O.G. 1mm are placed, the angle of these grooves should be parallel to the inclination of this area.
2. Any tooth structure between D.O.G were then removed following the contour of the tooth (keep the bur at the same angle)

Gingival plan:
1. D.O.G. 1mm are placed in gingival part should be parallel to the long axis of the tooth.
2. Any tooth structure between D.O.G should be removed using flat end taper diamond bur to create shoulder Finish line.



3. Lingual reduction:

As for PFM but with deeper reduction (1mm)

A. Cingulum area reduction:

D.O.G. of 0.8 mm placed in the center than used a small wheel diamond bur following the inclination of the tooth to reduce this area.

B. Lingual axial reduction:

D.O.G. of 0.8mm placed parallel to the long axis of the tooth. Flat end taper diamond bur is used to reduce this area using the same angle to create shoulder Finish line.

4. Proximal reduction:

Preparation of the proximal surfaces is done in the same as in the full metal crown preparation, then Smoothing of the preparation finally you should smooth the preparation to remove any sharp angle. Silicon index can be used now to check tooth reduction.

Types of finishing lines:

finishing line used for all ceramic crown is shoulder finish line all around. The depth and contour of shoulder is established with the tip of flat end tapered fissure bur. Sharp angles should be rounded to avoid the stress concentration.

Acrylic Jacket Crown

Totally made from tooth colored acrylic resin; it can be near perfect in appearance when fitted but later on discoloration, loss of contour take place. Poor adaptation is great disadvantages of acrylic crowns. Acrylic jacket crown used in treatment of selected patient such as young patient for whom other type of crown restoration are planned but delay until complete eruption of tooth take place. (used as temporary crown restoration). The preparation of the tooth is basically the same as that for porcelain jacket crown (all ceramic crown).

Disadvantages:

1. Poor marginal fitness.
2. Poor tissue response.
3. Discoloration with time.
4. Loss of contour (wear easily).

Partial Veneer Crown

Most commonly used type of partial veneer crown is ¾ crown.

Three quarter crowns:

It is a cast metal crown restoration that cover three quarter of crown (occlusal or incisal, palatal or lingual and proximal) leaving the labial or buccal surface unprepared, it tends to be less retentive and resistance than full veneer crown. It can be used for anterior or posterior teeth.

Uses:

1. As a retainer for short span bridge.
2. As a single restoration.

Indications

1. Suitable for teeth with a sufficient bulk and intact labial (buccal) surface.
2. Retainer for fixed partial denture.

Contraindication:

1. Short clinical crown.
2. High carries index.
3. Extensive destruction
4. Poor alignment.
5. Thin teeth
6. Long span bridge.
7. Non-vital teeth.

Advantages of 3/4 crown:

1- Conservative of tooth structure.
2- Easy access of margins.
3- Less gingival irritation than complete crown.
4- Easy escape of cement and good seating.
5- Electrical pulp test is possible.
6- Complete seating of the crown can be easily seen by direct observation.

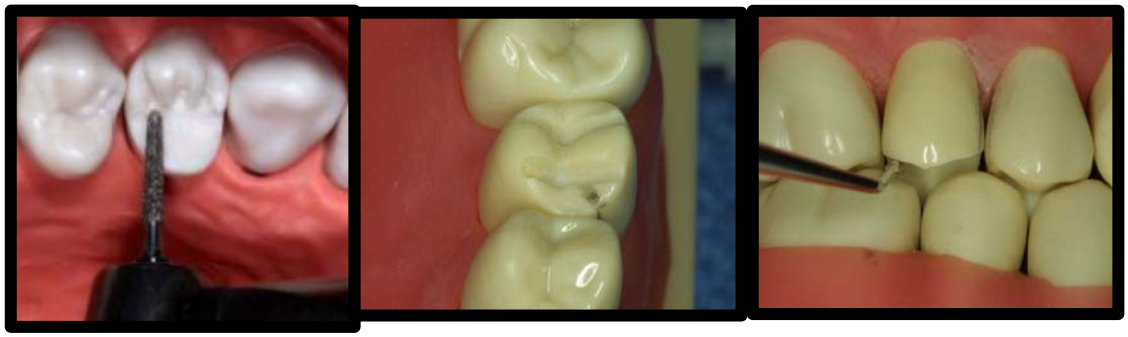
Disadvantages:

1- Difficult in preparation compared to other types of crown restorations.
2- Possibility of recurrent caries more along the cavo-surface line angle.
3- Possibility of showing metal especially in the lower teeth.
4- Less retention and resistance than complete cast crown.

Steps in preparation on maxillary posterior teeth

A. Occlusal surface preparation

1. D.O.G. placed on occlusal surface using round end taper fissure bur, the grooves should extend through occluso-buccal line angle but only with 0.5mm deep to prevent metal display.
2. Removing tooth structure between grooves reproducing the geometric inclined plan pattern of cusps, the depth of reduction should be decrease at the occlusal-buccal line angle.
3. A wide bevel is placed on the functional cusps using the same bur.
4. Occlusal clearance was then check in centric & eccentric relations.



B. Lingual surface preparation:

It is done similar to other types of crowns:

1. D.O.G. are placed using the same bur, they should be placed parallel to the long axis of the tooth.
2. Reaming tooth structure between grooves were then removed following the contour of the tooth holding the bur parallel to the long axis at the tooth
3. A round –end tapered fissure bur is used to obtain chamfer finish line.

C. Interproximal Reduction

1. Proximal access is gained by short needle diamond, up and down movement, this continue until contact with adjacent tooth is broken & access for larger bur is produced.
2. Avoid damage to adjacent tooth and excessive axial reduction

Proximal grooves:

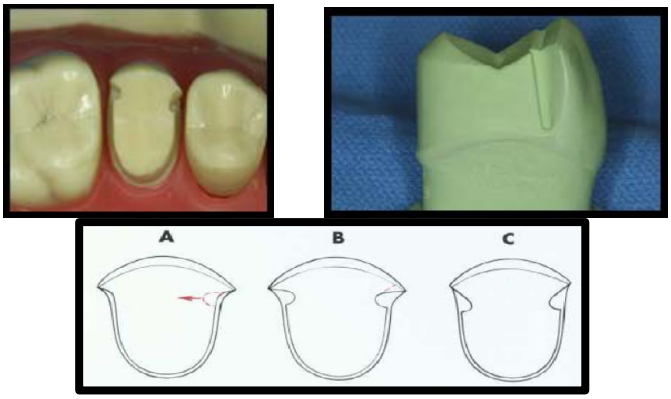
As a part of proximal reduction and in order to improve retention feature of the preparation and as a substitution for the uncover wall, proximal grooves should be placed on each proximal wall. It should be parallel to the long axis of the tooth or path of insertion & parallel to each other. Carbide fissure bur is used to place these grooves.

Requirements:

1. It should cut to full diameter of carbide bur No.171(0.5mm) to create defiant lingual wall.

2. It should extend to the full length of proximal wall (ending about 0.5mm to the chamfer).

3. It should be parallel to the long axis of the tooth.



Advantages of Proximal grooves:

1. Increase retention.

2. Prevent rotation (resistance).

3. Reinforce the margin of restoration at this area.

4. They act as a guide during placement.

Occlusal offset:

1mm wide groove made on the lingual incline of the facial cusp, it is V shape inverted lie at uniform distance from occlusal finish line.

Advantages**:**

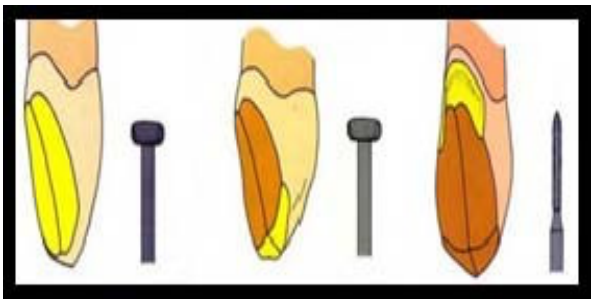
1. Improve the strength of the casting.
2. Reinforce the margin of the restoration at this area.

Finishing line:

Chamfer finish line on lingual and proximal surfaces

3/4 Crown Maxillary Anterior

1. lingual reduction: this is done by two steps similar to other types of crowns.
   a. Cingulum area reduction.
   b. Lingual axial reduction.



2. Incisal termination:

For maxillary anterior teeth lingo-incisal bevel is place using diamond bur at 45˚to the path of insertion, this termination should not be extended labially to prevent showing of metal, however, for lower anterior a reverse bevel is placed on the labial surface. This means that, the metal will extend to cover the incisal edge in order to:

1. Protect the area of unsupported enamel from fracture.
2. To prevent the dislodgment of the crown in lingual direction.

3. Proximal reduction:

The area is prepared similar to the full veneer crown except that the preparation should have a path of insertion parallel to the incisal 2/3 of the labial surface.

Two proximal grooves should be placed, at the junction between the labial and middle third of the proximal surface, parallel to the incisal 2/3 of the labial surface using a carbide fissure bur, this is because:

The mesial and distal grooves should be connected with V shape groove incisal offset. The advantage of the incisal offset are:

1. improvement of the strength of casting at this area
2. reinforcement of margin by connecting the two proximal grooves together

Differences between anterior and posterior teeth preparation
In the anterior teeth the retentive proximal groove should be parallel to the incisal 2/3 of the labial surface while in the posterior teeth it is parallel to long axis to get the longest groove for better retention of crown.