

CROWN AND BRIDGE

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Full metal crown with facing (Full veneer crown)

It is a full metal crown having the labial or buccal surface covered by a tooth colored material (acrylic or porcelain). It combines the strength of full metal and the cosmetic effect of the tooth colored material. The restoration consists of a complete-coverage cast metal crown (or substructure) that is veneered with a layer of fused porcelain to mimic the appearance of a natural tooth. The extent of the veneer can vary. It can be used on the anterior and posterior teeth. It is not a conservative type of crown because it includes excessive tooth preparation to provide enough space for the metal and the facing material.

Indications: -

1. Improvement of esthetic (carious teeth, malposed teeth, peg shaped lateral incisor, colored teeth).
2. Fracture of tooth.
3. Teeth with large filling.
4. As a bridge retainer especially in long span bridge.
5. On endodontically treated teeth with sufficient tooth structure.



Contra-indications:-

1. Teeth with large pulp (Because of possibility of pulp exposure during preparation).
2. Teeth with short crowns.
3. Patient with bad oral hygiene.
4. Cannot accommodate a rest for removable partial denture.

Preparation of Full metal crown with facing on Posterior teeth

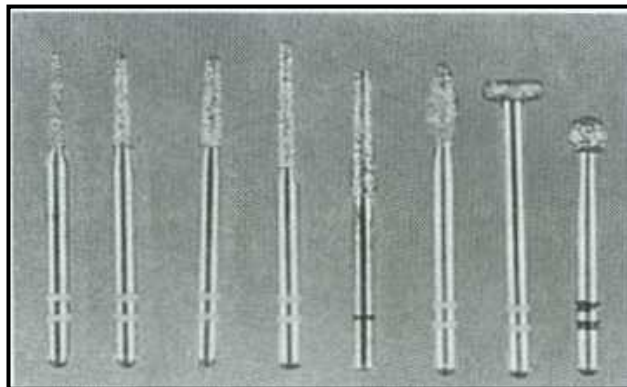
The same principle of preparation of the full metal crown should be followed except for the buccal preparation where it should be deeper than that for the full metal crown preparation, this is important to provide enough space for the metal and the facing material, and to get a proper shade of the final crown.

The finishing line should be beveled shoulder on the labial surface and chamfer on the other surfaces.

Porcelain- fused- to- metal crown (Metal – ceramic crown)

Armamentarium: The instrument needed to prepare teeth for a metal – ceramic crown include.

- Round – tipped rotary diamonds (regular grit for bulk reduction, fine grit for finishing) or carbides.
- Football –or- wheel –shaped diamond (For lingual reduction of anterior teeth).
- Flat –ended, tapered diamond (for shoulder preparation).
- Finishing stones.
- Explorer and periodontal probe.



Step-by-Step Procedures.

The preparation is divided into five major steps.

I - Guiding groove

II - Incisal or occlusal reduction of

III - labial or buccal reduction.

IV – Lingual reduction A – Cingulum and concavities. B - Axial reduction of the proximal and lingual surface.

V – Finishing and evaluation.

Guiding Grooves:

Place three depth grooves. One in the center of the facial surface and one in each mesiolabial and distolabial line angles.

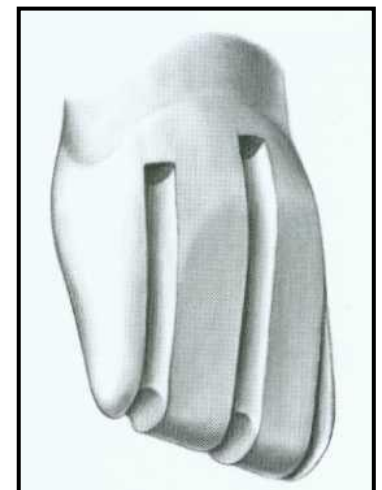
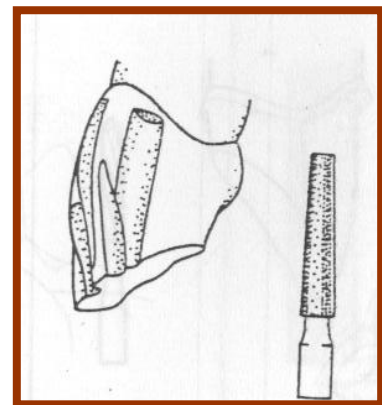
This will be in two planes:

- The cervical (gingival) plane that is parallel to the long axis of the tooth. This will determine the path of insertion of completed restoration.

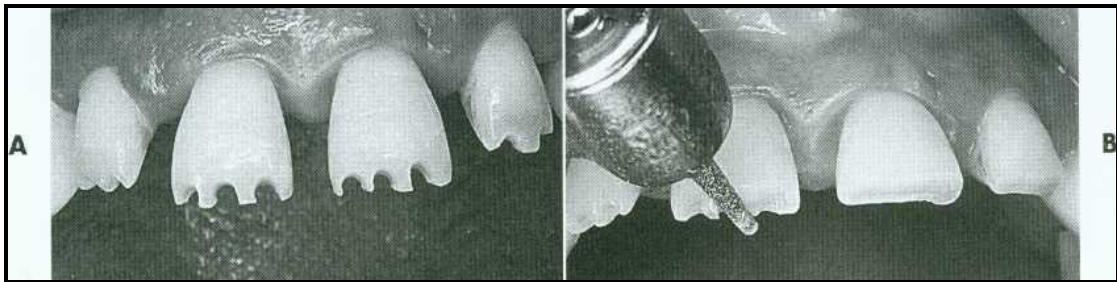
- The incisal or occlusal portion follow the normal facial contour this will provide the space needed for the porcelain veneer; provide 1.3 mm deep to allow for additional reduction during finishing.

- Place three depth grooves (1.8mm deep) in the incisal edge of an anterior tooth. This will provide the needed reduction of 2mm and allow finishing. When initially positioning the diamond for anterior teeth reduction, it may be helpful to observe the long axis of the opposing tooth in the

intercuspal position, so orient the instrument perpendicular to that. On posterior teeth where the occlusion is to be established in porcelain, 2mm of clearance must exist. This will include the use of a centric cusp bevel, although additional occlusal reduction will be needed where the porcelain is to be applied



If the occlusion is to be established in metal, the same minimum clearances are needed as for a complete cast crown.

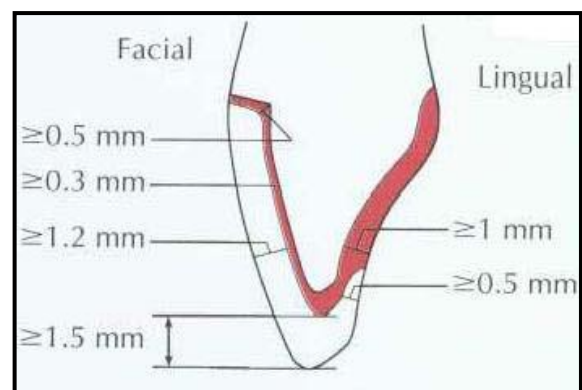


Incisal (Occlusal) Reduction.

- The completed reduction of the incisal edge on an anterior tooth should allow 2 mm for adequate material thickness to permit translucency in the completed restoration. Posterior teeth generally require less (1.5 mm) because esthetics is not as critical. Caution must be used, however, because excessive occlusal reduction shortens the axial walls and thus is a common cause of inadequate retention and resistance form in completed preparation because most of the retention is derived from the proximal walls in anterior teeth.
- Incisal (Occlusal) reduction should be done first to allow easy instrument access to the axial surfaces and the gingival finish line. Inadequate incisal reduction results in poor incisal translucency in the finished restoration. Remove the islands of remaining tooth structure between the guiding depth grooves.

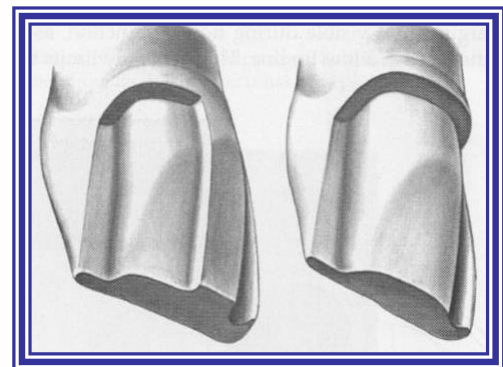
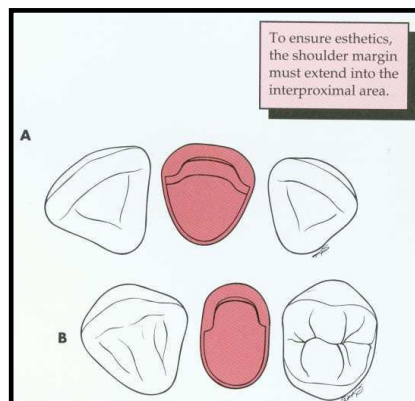
Labial (Buccal) Reduction.

When completed, the reduction of the facial surface **should** have produced sufficient space to accommodate the metal substructure and porcelain veneer. A minimum of 1.2 mm is



necessary to permit the ceramist to produce a restoration with satisfactory appearance (1.5 mm is preferable). This requires significant tooth reduction.

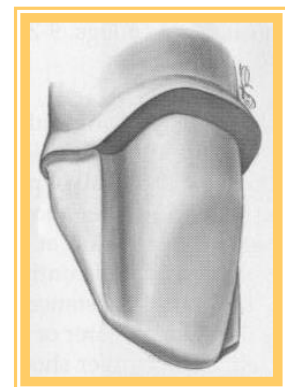
- Remove the remaining tooth structure between depth grooves, creating a shoulder at the cervical margin. The facial shoulder should extend at least 1mm lingual to the proximal contact, to ensure esthetics, proximal flange will be produced.



Although the resulting wings of tooth structure can provide: -

- 1- Some resistance to rotation that is not the primary reason for their existence.
- 2- Conserve tooth structure.
- 3- Retention.

It is important that the portion of each wing that faces labially has the same inclination as the gingival portion of the labial surface.



- The location and specific configuration of the facial margin depend on several factors; the type of metal – ceramic restoration selected the cosmetic expectations of the patient, and operator preference.

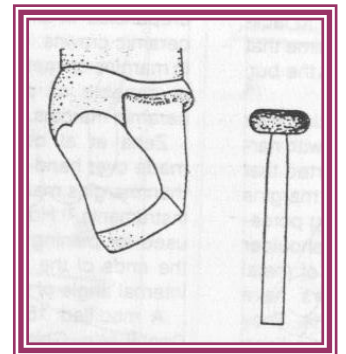
- From a periodontal point of view, a supragingival margin is always preferred. Its application is restricted, however, because patients often object to a visible metal collar or discolored root surface. Such objections are common, even when the gingival margin is not visible during normal function, as in patients with a low lip line. This generally limits the use of supragingival margins to posterior teeth, and to un-discolored anterior teeth. Where a subgingival margin is to be placed, careful tissue manipulation is essential otherwise, there will be damage that leads to permanent gingival recession and subsequent exposure of the metal collar.

Lingual Reduction

A - Cingulum and Concavities Reduction.

- The concavities of the lingual surface are reduced with a small wheel diamond or foot ball diamond. On anterior teeth,

A lingual concavity is prepared for adequate clearance. Typically, 1mm is required if the centric contacts in the completed restoration are to be located on metal. When contact is on porcelain, additional reduction will be necessary.



The junction between the cingulum and the lingual wall must not be over reduced. Over shorting the lingual wall will reduce retention.

B - Axial Reduction of the proximal and lingual surfaces.

Sufficient tooth structure must be removed to provide a distinct, smooth chamfer of about 0.5 mm width.

- Reduce the proximoaxial and linguoaxial surfaces with the diamond held parallel to the intended path of withdrawal of the restoration. Taper of approximately 6 degrees is recommended.

- For anterior teeth, usually only one groove is placed, in the center of the lingual surface.



- For molars, three grooves can be placed similar to that described for the complete cast crown (use round –end diamond), make a lingual alignment groove by positioning the diamond parallel to the gingival plane of the facial reduction, it will be almost halfway submerged into tooth structure, and carry the axial reduction from the groove along the lingual surface into the proximal.

- As the lingual chamfer is developed, extend it buccally into the proximal to blend with the interproximal shoulder placed earlier, a lingual chamfer is prepared to allow adequate space for metal.

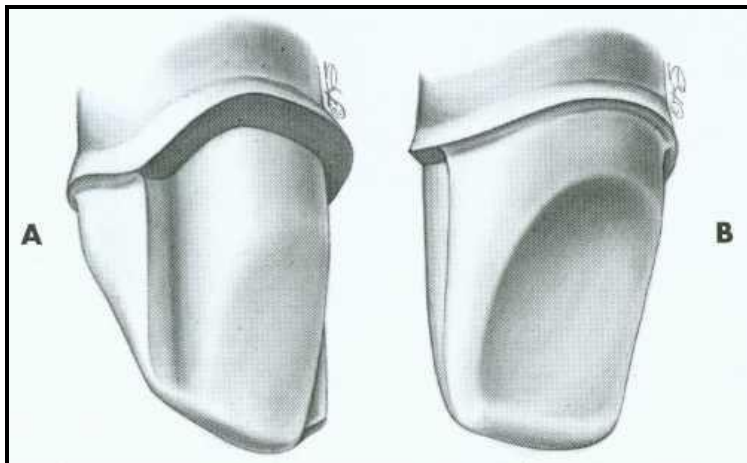
The interproximal margin should not be inadvertently place too far gingivally and thereby infringe on the attachment apparatus. It must follow the soft tissue contour. The lingual aspect of the proximal axial walls, as well as the lingual surface, is reduced with the torpedo diamond, accentuating the chamfer on the lingual and proximal surface.



Finishing:

- 1- The margin must provide distinct resistance to vertical displacement of an explorer tip; it must be smooth and continuous circumferentially. (A properly finished margin should feel like smooth glass slab.)

- 2- All other line angles should be rounded, and the completed preparation should have a satin finish free from obvious diamond scratch marks.
- 3- Finish the margins (finish line) with diamonds, or carbide of fine grit, with slow speed .All internal line angles should be radiused to facilitate the impression –making and die – pouring steps.
- 4- Round all sharp line angles within the preparation. This will facilitate all subsequent procedures of crown fabrication, using slightly larger torpedo diamond to finish the walls and chamfer finish line. This is because the greater diameter of its tip will prevent ((ditching)) of the chamfer and ensure removal of any lip of unsupported enamel. Blend all surfaces together, and remove any sharp transitions.



Evaluation:

- Avoid creating an undercut between the facial and lingual walls.
- Excessive convergence should be avoided, because this may lead to pulp exposure.
- Avoid any unsupported tooth structure at the shoulder and chamfer finish line.

- The completed chamfer should provide 0.5 mm of space for the restoration at the margin.
- The chamfer should be continuous with the interproximal shoulder.

Preparation of (F.V.C.) on canines

The same steps of preparation of (F.V.C.) on incisors are followed for canines with only two exceptions which are:-

1. For the cusp area the (D.O.G.) should be placed at the tip of the cusp and by moving the bur mesially and distally along the slopes of the cusp this area will be reduced, therefore any horizontal straight reduction should be avoided at the cusp area.
2. For the palatal or lingual surface, the final preparation should preserve the lingual anatomy of the lingual ridge and 2 lingual fossae.

