

DEN491
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**CROWN ABUTMENT FOR REMOVABLE PARTIAL DENTURE
(SURVEYED CROWNS)**

Success demands that all the customary requirements for each restoration, fixed or removable, be met and the additional requirements for integration be ascertained and fulfilled.

DEFINITION

Surveyed Crowns: Single crowns and fixed partial denture retainers used to support clasp type RPDs. The crown should provide preplanned guide surfaces, rest seats, retentive areas, and axial contours to support and retain clasp type RPD.



INDICATION

- Most commonly utilized when the abutment tooth is grossly carious or heavily restored.
- RPD abutments usually require modifications in order to provide distinct path of insertion, suitable rest location, favorable guide surfaces and satisfactory retentive undercuts. Some abutments need only slight modifications while other requires extensive alteration. Major modification of abutment can be achieved with restoration. Surveyed crown enable these modifications to be made in conjunction with the ideal design and location of the components of RPD.
- Over eruption.

DIAGNOSIS & TREATMENT PLAN

- Includes the use of dental surveyor to locate the most favorable path of insertion on the diagnostic cast.

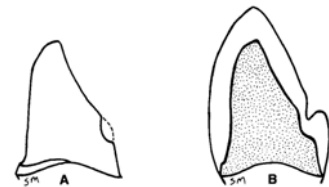
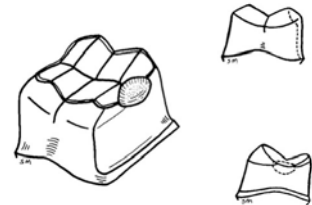
Surveying the diagnostic cast is an essential component of RPD. **Surveying** is the diagnostic procedure that analyzes the dimension relationships of oral hard and soft tissue. It must be accomplished in association with decisions regarding the

determination of the path of insertion, the selection of abutments, the location of clasp assemblies and the type of major connector.

- The framework is then designed and completely outlined on the diagnostic cast.
- Record of the path of insertion on the cast.

CLINICAL PROCEDURES

- Prior to tooth preparation for crown, guiding planes are developed on the abutment teeth not receiving cast restoration
- Additional axial reduction is performed where guiding planes are planned
- Space is provided within the tooth preparation for rest seats and allow for sufficient bulk of metal in the casting
- Embrasure clasp – space for the clasp + rest
- Cingulum rest (maxillary canine) – more reduction for gingival one third of lingual surface will be necessary if there is little or no space between anterior teeth
- The partial veneer (eg. $\frac{3}{4}$ crown) preparation should be planned so that clasps of the RPD will not adversely affect the marginal integrity of the casting

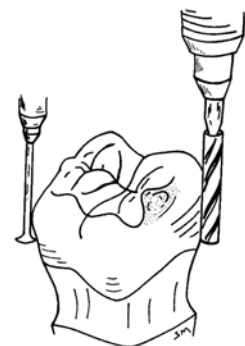


LABORATORY PROCEDURES

If preparations are adequate, wax patterns can incorporate the features necessary for RPDs while still maintaining normal physiologic contours.

The use of a surveyor is indispensable in locating and preparing retentive areas and guiding surfaces.

The wax pattern is surveyed with a metal analyzing rod and undercut gauge of the desired depth. A contrasting medium such as tin oxide powder is brushed on the wax pattern. Height of contour or undercut will be burnished with side pressure from the surveying instrument.



A. Procedures for Full Metal Crown

1. Wax the crown to obtain normal complete contours and occlusion.
2. Place the master cast on the surveying table and align the cast consistent with

the planned path of insertion and guiding planes prepared on other natural teeth.

3. Cut a guiding plane in the wax pattern that is flat occlusogingivally and parallel to the path of insertion. The original faciolingual contour of the tooth is maintained.

The occluso gingival dimension is approximately a half to two-thirds the crown length; 3 to 4 mm is usually adequate. Guide surface should be created before rest seats; otherwise, portions of the rest seats may be removed during contouring of the guide surfaces.

4. Develop the occlusal rest preparation. Ideally, rests should transmit forces down the long axis of the abutment teeth, and therefore, must not be located on inclined surfaces. Wax is removed using a no. 8 round carbide bur. The contour is then refined with a cleoid-discoid carver. The occlusal rest preparation is at least one-fourth the mesiodistal width of a molar crown (one-third for premolars) and one-third the buccolingual width or one-half the distance between the cusp tips. The depth of the rest seat is at least 1.5mm in the deepest portion. The rest seat is spoon-shaped when viewed in cross-section with the deepest point at its center. The rest preparation is designed slightly shallower as it crosses the marginal ridge, so that the rest seat will incline toward the tooth. When viewed from the occlusal, the rest preparation is a rounded triangle. There must be no sharp angles associated with the occlusal rest seat.

Special attention should be given to the area of the wax pattern where the rest and minor connector will join. Contours at the junction of the linguo proximal and occlusal areas should provide the space necessary for bulk and strength of metal without unduly compromising the normal coronal morphology. Crown contours should also allow for the positioning of the minor connectors so that these will not interfere with the opposing occlusion or be noticeable to the tongue.

5. A planned lingual bracing surface can be created that is flat occluso gingivally and follows normal tooth curvatures. A lingual ledge is not recommended, since hypercontour of the gingival third of the crown results. The lingual surfaces of lingually inclined mandibular premolars may interfere with the

placement of a major connector. If these surfaces are not adequately prepared or the wax pattern correctly contoured, the lingual bar will be located medially in the floor of the mouth when prosthesis is fully seated.

A flat lingual bracing surface on mandibular premolars will facilitate placement of lingual bar major connector.

6. Wax the facial surface to form an ideal survey line and a 0.015 to 0.02 inch retentive undercut. This undercut will later be reduced to 0.01 inch during finishing and polishing procedures. The surface of the abutment that is to provide retention should be contoured so that the clasp tip may be placed in the cervical third of the crown.
7. Invest and cast the wax pattern. The casting surveyed again to ensure desired contours. Corrections are made by grinding away excessive contours or adding solder where contours are deficient. When excessive contours exist, a handpiece holder is attached to the vertical area of the surveyor and a straight handpiece with a straight fissure bur or cylinder stone is attached to the holder. The casting then finished and polished and then surveyed for the last time.

B. Procedure for Metal-Ceramic Crown

Steps 1 to 6 are followed as for a full metal crown:

7. After completing the wax pattern, wax is cut away in the areas to receive the ceramic veneer. The retentive arm of the clasp can be successfully placed on glazed porcelain. If occlusal porcelain is planned, the rest seat, guiding plane, and lingual bracing surface are recommended in metal.
8. Invest and cast the wax pattern. Porcelain is applied, and the crown is surveyed to ensure acceptable contours. The facial porcelain is ground to form an ideal survey line with a 0.01 inch retentive undercut.
9. Characterize and glaze porcelain. The metal is finished and polished. The crown is then surveyed for the last time.

PROBLEMS AND COMMON ERRORS

- Often there is insufficient tooth reduction and this prevents the development of that guiding surfaces and rest seat of acceptable contour and depth
- Guiding plane not parallel with path of insertion

- Rest seat does not slope toward the tooth
- Improperly contoured survey line for retentive arm
- Insufficient or excessive retentive undercut
- Overcontouring of the crown
- Survey line on the bracing surface is too high