The endocrown is a restorative option for endodontically treated teeth. This technique I have used successfully for 11 years. It has been refined some and improved with time. I would like to share my observations on what I feel is a sound, conservative, efficient technique that preserves sound tooth structure, avoids “total enamel amputation”, avoids further stresses and destruction of the radicular dentine and thus reduces the chance of root fracture and iatrogenic damage during preparation.

It consists of a circular butt-joint margin and a central retention cavity inside the pulp chamber without intraradicular preparation.

In summary it is an onlay crown which engages the pulpal chamber. If this design is appropriate and chosen as the restoration of choice to follow the root canal therapy once completed, then pre RCT preparation for the restoration will provide generous visual and mechanical access to the canals and facilitate the endodontic procedure.
The Concept

To engage the large pulpal chamber of root treated molar teeth with one piece Lithium Dislicate milled restoration which provides cuspal coverage.

To bond to a circumferential enamel margin and internal dentine of the pulpal chamber.

To preserve sound buccal and lingual enamel.

To avoid intra-radicular preparation and further compromise of the root structure.

To allow reentry to the canals if required without post removal.

To reduce patient cost and chairside time.

Indications

Successfully root treated molar.

Not applicable for premolars or incisors due to the ratio of “core diameter to remaining dentine radicular walls.”

Supra-gingival margins interproximally.

Adequate thickness of buccal and palatal cusps.

Adequate height of buccal and palatal cusps. Not applicable with less than 50% height.
Cavity Preparation Guidelines

Reduction of the cusp height by 2 - 3 mm. To provide a “V prep.
90 degree butt margins.
Smooth transitions internally.
Undercuts ok - these will fill with luting.
Fine surface finish with abrasives and air abrasion to remove loose enamel prisms at margins.
Pulpal chamber preparation with
  6 degree taper (can be defined by specific bur)
  Flat pulpal bottom preparation to reduce “wedging”.
  Sealed radicular spaces (Gp/glass ionomer.) No engagement of canals.
Interproximal preparation -
  Preferred finish of margins in enamel, supragingivally,
Piezon/Ultrasonic preparation for shaping 90 degree curved base eg.
Use of “Deep Margin Elavation” ala Pascal Magne DMD, PhD. Or crown lengthening.
Use of “Expasyl” if required for crevicular moisture/bleeding control. Note leave in situ for two minutes.
Ideal Dynamics / Workflow for One Visit “Endodontics and Restoration”

Following diagnosis, discussion of options and fees, consent and decision to proceed with endodontics and crown.

**Endodontics 60 - 90 minutes**

1. LA
2. Shade taking PRIOR TO RUBBER DAM PLACEMENT (PREVENTS SHADE CHANGE WITH DEHYDRATION).
3. Pre-op impression (physical or Cad-Cam) especially if occlusion to be “copied”/correlated.
   - Permits temporary crown fabrication if not completing same visit.
4. Opposing impression (as above).
5. Bite registration or cad cam “buccal bite.”
6. Rubber dam placement.
7. Removal of old restoration and decay - re-assess and examine for fracture lines.
8. Prepare coronal reduction 2 - 3 mm and pulpal chamber for final restoration.
   - Gives excellent access for canal preparation.
9. Commence root canal preparation. - (My Preferred Technique)
   Fine canal finder/Reciproc, Apex locator working length, irrigation, radiographic confirmation, final preparation of canals, GP placement, radiographic confirmation, dry canals, obturation reverse smaller file to WL, “System B”, downpack “Buchanan Plugger”, backfill, glass ionomer canal seal, finalise “endocrown” preparation (see above), air abrasion to clean dentine, final wash 5% naocl, remove rubber dam, radiographs.

**Restoration 90 minutes**

10. Cad-Cam Impression, design, mill Lithium Discilicate E-Max monoblock (30 minute),
11. Fit and occlusion check, Vacuum firing cycle with stain and glaze, (30 minutes)
   - Non Cad-Cam, Physical impression and temporise.
12. Cementation:
   Rubber dam one tooth behind and forward so not to imping on contact points, silanisation, etch tooth, bond application to dentine and enamel, Variolink DUAL CURE (radio-opaque) flossing of contact points, x ray to determine cement not subgingival between contact points. (30 minutes)

Advantages of Cad-Cam - can set “parameters of cement spacing’ to eg 60 microns.
No temporarising placement or removal, No shift in contact point or occlusal drift.
“One Visit for Patient”, Protects root canal immediately.

**Average appointment time - Endo 90 minutes, Endocrown 90 minutes. Total time 3 hours.**

**Fees: Molar root canal, Post and core, Full crown coverage, (discretionary discount for “Post and Core”)**

**COMBINED TECHNIQUE FOR CAD CAM CHAIRSIDE USER.**

Note the restoration may be commenced prior to the completion of the endodontics.

Often I will take the image for the restoration once I have confirmation of working length and patency with radiographically and Apex Locator. I will taken the image at this stage and while the canal is being irrigated design and commence the milling procedure. This takes 30 minutes maximum.

During the milling I continue with the RCT and then try in the Endocrown once milled. Then while the crown is firing in the vacuum furnace I can complete the obturation.

Thus by the time the crown has fired I have completed the RCT and proceed immediately to the cementation with Variolink as my cement of choice. This technique means the up to one hour can be eliminated from the overall time.

**Total time then 2 hours**

THIS EFFICIENCY MAKE THE PATIENT VISIT MORE EFFICIENT, MORE PLEASANT
AND YOUR TIME MORE PRODUCTIVE.