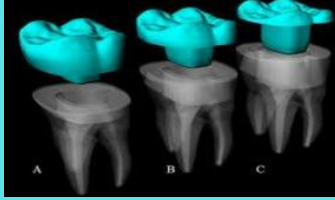


STRONG, SIMPLE, STUNNING: THE POWER OF ENDOCROWNS

An Endocrown is a dental restoration used for severely damaged root canal treated tooth .

It fits within the pulp cavity,providing a durable esthetic solution while preserving more natural tooth structure.



WHY ENDOCROWN?

Advantages

- 1.Dentin Preservation.
- 2.Fracture Resistance.
- 3.Contamination prevention.
- 4.Simplified Retreatment.
- 5.Enhanced adhesion.
6. Time Efficiency.

Indications

- Significant coronal structure loss with limited interocclusal space
- Inadequate clinical crown length and extensive dental tissue loss
- In premolars when supragingival walls are 1-2 mm in height and atleast 2 mm thick, with a pulp chamber depth of 3mm.

Contraindication

- Cannot be adequate with Severe dental tissue removal
- Preparation below cemento-enamel junction
- Anteriors and premolar have higher non axial forces

Materials

- Lithium disilicate glass ceramic
- Zirconia reinforced lithium silicate glass ceramic
- Zirconia & indirect resin composites

Cementation

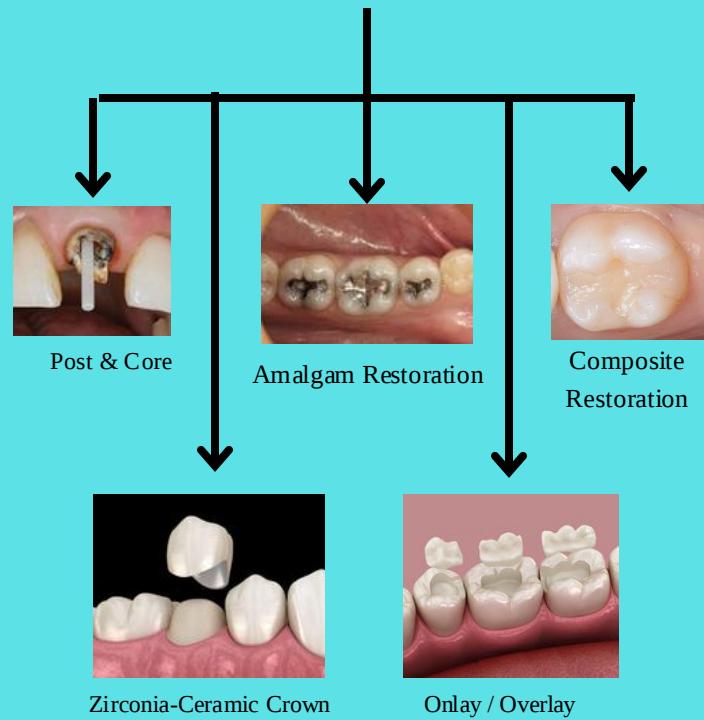
- Resin Cements

In office -CAD/CAM Protocol

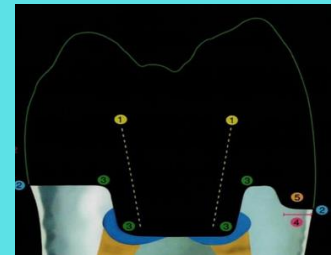
Mashinabe Blocks



POST ENDODONTIC RESTORATION



Features of tooth Preparation



1. 6 degrees taper in each wall
2. Sharp margins with approx 90° butt joint
3. Rounded Internal angles
4. 6 Degrees taper in each wall
5. Ferrule (Optional)

STEPS IN PREPARATION

- 1.OCCUSAL REDUCTION
- 2.AXIAL REDUCTION
- 3.FLOOR PREPARATION
- 3.FINISHING AND POLISHING
- 4.CEMENTATION PHASE

Occlusal reduction

- A 2 to 3 mm cuspal reduction 90°
- Circumferential butt joint margins with a width of 1 to 2 mm

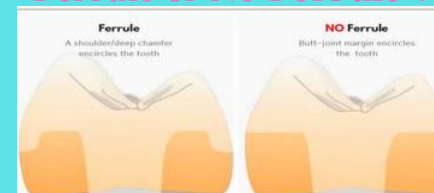


Axial reduction



All cervical margins placed as supra gingivally as possible

Ferrule or No Ferrule ?



The ferrule effect enhances retention with a 1-mm chamfer or rounded shoulder, limiting insertion paths for better Endocrown seating and adhesion.

For extensive tooth destruction with limited structure, a butt-joint margin is used to preserve and define preparation boundaries.

Floor preparation



Maintain a 5-7° occlusal divergence for coronal pulp chamber access and remove gutta-percha up to 2 mm to utilize the saddle-like anatomy of the cavity floor.

Finishing and polishing

Smooth internal transitions & a relatively flat pulp chamber floor with sealed radicular spaces



Cementation phase

- Surface treatment of the restoration



Etch the internal surface with hydrofluoric acid per the ceramic manufacturer's instructions, rinse, and dry. Apply multiple layers of silane for about 60 seconds.

- Surface treatment of the substrate



Etch the prepared surface with phosphoric acid for 15 seconds, protecting adjacent teeth with celluloid bands. Rinse, remove excess moisture, and apply multiple layers of a light-cured adhesive.

- Curing for 5 seconds

Curing is done for about 5 seconds to hold the restoration in place and remove excess cement and adhesive.



Remove the rubber dam, check and adjust any high occlusal contacts with fine diamond points, then polish adjusted areas with intraoral ceramic polishers.

CLASSIFICATION OF ENDOCROWN



- **CLASS I:** Shows a tooth structure where a minimum of two cuspal walls have a height greater than half of their original height.
- **CLASS II:** Demonstrates a prepared tooth where a maximum of one cuspal wall has a height more of the half of its original height.
- **CLASS III:** Describes a tooth preparation where all cuspal walls are less than the half of the original height.

Fracture Resistance

- Fracture resistance of molar Endocrowns were higher than post-crowns. (Biacchi GR, Basting RT. C 2012). - Fracture resistance of molar Endocrowns were equal to crowns without a post (Carvalho et al 2016)
- Fracture resistance of premolar Endocrowns were equal or higher than post-crowns (Pedrollo Lise et al 2017) (Atash et al 2017)
- FRACTURE RESISTANCE Machinable materials used to fabricate Endocrowns : 1- Nanoceramic resins (Lava Ultimate, 3M) (Cerasmart, GC)

Futuristic approaches

- Nano materials
- Self healing polymers
- Digital design & fabrication



Reference:

- Endocrown form virtuality to reality byESLAM S ZAKZOUK.
- A Thorough Analysis of the Endocrown Restoration: A literature Review Contemp Dent Pract 2021;22: 422-426