



PEDIATRIC ENDO CROWN- A CLINICAL CASE REPORT

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ABSTRACT **Aim And Background Of The The Case Report:** All the teeth that have undergone endodontic therapy require some form of restoration to enable them to function again. Endodontic treatment removes the vital contents of the canal, which subsequently leads to reduction in elasticity, desiccation and increases brittleness of remaining tooth structure. The loss of structural integrity increases the incidence of crown fractures and microleakage at the margins of restoration in endodontically treated teeth compared with 'vital' teeth. Minimally invasive preparation to preserve maximum amount of tooth structure is considered to be the standard main goal for restoring teeth. This is a case of endodontically treated lower right mandibular 2nd primary molar requiring post endodontic management which was treated with EndoCrown.

KEYWORDS : endo crown, pulpectomized teeth, composite

INTRODUCTION

The rehabilitation of severely damaged hard tissue and endodontically treated teeth is always a challenge in reconstructive dentistry¹. The primary reason for reduction in stiffness and fracture of endodontically treated teeth is the loss of structural integrity associated with caries, trauma and extensive cavity preparation, the loss of the structural integrity in turn increases the crown fracture and microleakage at the margins of restorations in endodontically treated teeth. Hence the restoration with endocrowns has been suggested as an alternative treatment for endodontically treated posterior teeth² which is made possible through recent development and advancement in adhesive techniques and composite materials¹. Endo crowns requires a minimal tooth preparation which preserves maximum amount of tooth structure considered the gold standard of restoring a tooth. The preparation for endocrown consist of a circumferential 1.0 to 1.2mm butt margin and a central retentive cavity inside the pulp chamber and the endocrown is constructed as a single unit core called monobloc^{3,4}. This monobloc core that is placed inside the pulp chamber obtains stability through adhesive bonding.

These endocrowns are indicated for those cases presenting with reduced intermaxillary space or short clinical crowns⁵ however this restorative alternative is contraindicated when bonding cannot be achieved and also for teeth with pulp chamber with less than 3mm in depth or with the cervical margins thinner than 2 mm⁶.

An endocrown may be produced from composite or mineral ceramic⁷. Assuming the lack of study about this innovative technique of restoration in primary molars with endocrown, the study aims to report a clinical case about composite endocrown in a pulpectomized primary mandibular molar of a pediatric patient.

CASE REPORT

A 5 year old female patient presented to the department of pediatric and preventive dentistry, SRM Kattankulathur dental college, Chennai with the chief complaint of painful decayed tooth. On clinical and radiographic examination, it was diagnosed to be dental caries with chronic irreversible pulpitis in 85. The treatment option was decided to be pulp therapy followed by a conservative ENDOCROWN using light cure composite material, as more than half of the residual tooth structure were remaining. An informed consent was obtained from the patient's parent and the treatment procedure was started.

The tooth was anaesthetised and pulpectomy was performed under rubber dam. The cavity was prepared using a cylindrical-conical

diamond bur with a occlusal convergence of 7° to make the pulp chamber continous with the access cavity, and the pulp chamber was smoothed with an occlusal butt joint using very minimal pressure. The average depth was measured to be about 4mm after the preparation was completed⁸. The canal was obturated using metapex and a layer of type 2 GIC was used to seal and protect the canal orifices⁸ and to line the pulpal floor to increase the adhesion following which the cavity depth was measured to be 3.5mm. Shade selection was done under natural light. (Fig 1 and Fig 2)

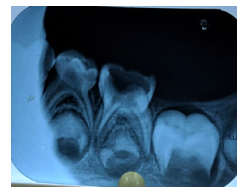


Fig 1-pre-operative radiograph of 85



Fig 2-post-operative radiograph of 85

The prepared cavity was isolated, dried and a complete evaluation of the interocclusal space and the preparation was done. Impression was recorded using a double impression technique with polyvinyl siloxane material (Dentsply Aquasil soft putty- Regular set and light body). The working cast was poured using diestone

The cast was evaluated for any irregularities and undercuts. Rubber sep (separating medium) was applied in the cast followed by incremental light cure composite resin buildup. The sprue was also made using LC composite resin for easy retrieval of the crown from the cast. Initial layer of composite was adapted to the base of the preparation in the cast followed by sprue attachment and subsequent buildup. The composite resin was adapted to the cuspal morphology and was polymerised. The restoration was retrieved, evaluated, finished and polished. (Fig 3a and 3b)



Fig 3a

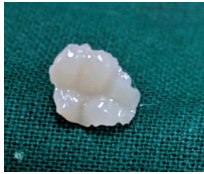


Fig 3b

Fig 3a and 3b : Processed endocrown

Try in of the endo crown was made , occlusion and marginal adaptations were checked and verified. Cementation was done on the same day under rubber dam. A two step etching and bonding system was used to increase the bond strength. Dual cured adhesive composite resin cement (G-CEM) was used for cementation⁹ . The crown was seated and excess cement was removed , followed by polymerization, finishing and polishing. (Fig.4a and 4b)

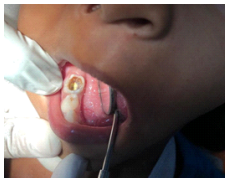


Fig 4a: tooth preparation for endo crown



Fig 4b: luted endo crown

DISCUSSION

An endocrown is a conservative restorative procedure that preserves root tissue and keeps internal preparation of the pulp chamber to its anatomical shape. However when adapting this innovative technique in pediatric restorations ,few modifications becomes inevitable. They include

- Avoiding the circumferential preparation in order to preserve the existing thin enamel and also considering the advantage of the orientation of enamel rods occlusally.
- Use of light cure composite resin instead of ceramic to prevent root fracture^{10,11} and because of the limitation of the enamel and dentin thickness to support ceramic.
- Case selection is limited to class I and in class II conditions where there is minimal loss of tooth structure as no circumferential preparation is done.

The retention of endocrowns are majorly based on the mechanical anchoring into the pulp chamber and the use of a proper adhesive system¹². Use of a dual cured adhesive system is thus considered to be most successful^{13,14}. This mode of restoring an endodontically treated primary molar can be beneficial because of its increased esthetics, lesser stress concentration and lesser chance of tooth fracture because of its minimal preparation design. The stress bearing capacity of a conventional CEREC endocrown is high compared to CEREC crowns which is substantiated by WEIBULL'S ANALYSIS OF BITING for normal biting shows that the failure probability was 95%, 2% and 2% for the inlay, endocrown and conventional crown restorations, respectively¹⁵.

CONCLUSIONS

The preparation of endocrowns for pediatric patients includes simple steps in tooth preparation and also considerably reduces the chair side

time which is critical to pediatric patient management. Forces are dissipated through the cervical butt joint to the pulpal floor. So these endocrowns can be an alternative treatment plan in endodontically treated primary molars and also meets the goals of minimally invasive dentistry in addition to its greatest advantage of time management which remains in critical parameter in pediatric patient management. However few of its disadvantages like chances of debonding and fracture if used with ceramic can be subsequently solved by proper case selection and follow up. Endocrowns do require long term follow up studies to prove its efficiency and longevity.

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