

**ENDOCROWN-A UNIQUE WAY OF
RETENTION-CASE REPORT**

ABSTRACT

All the teeth that have undergone root canal therapy will require some form of restoration to enable them to function again. Because endodontic treatment removes the vital contents of the canal, which subsequently leads to reduction in elasticity, dessication and increases brittleness of remaining tooth structure.

The loss of structural integrity increases the occurrence of crown fractures and microleakage at the margins of restoration in Endodontically treated teeth compared with ‘vital’ teeth. Minimally invasive preparation to preserve a maximum amount of tooth structure is considered to be the standard main goal for restoring teeth.

This is a case of Endodontically treated right maxillary molar requiring post endodontic management which was treated with EndoCrown.

Key words- Endodontically treated teeth, Endocrown.

INTRODUCTION-

Post-endodontic restoration should preserve and protect the existing tooth structure, while restoring satisfactory esthetics, form, and function. The goal is to achieve minimally invasive preparations with maximal tissue conservation for restoring endodontically treated teeth. This will help to mechanically stabilize the tooth-restoration complex and increase surfaces available for adhesion¹.

A number of treatment modalities available depends on choice of structural integrity, functional load and esthetics. In these perspective

Endocrown is good alternative to full crown followed by post and core in cases with endodontically treated teeth with short crown height but sufficient tissue available for adhesion and stability.

In the present paper ceramic endocrowns fabricated and presented as case reports-

CASE REPORT-

A 25-year-old male patient reported for the fractured restoration in upper right back region of jaw. On clinical examination tooth number 16 was root canal treated one month back (Figure 1). It was asymptomatic and the surrounding structures were normal. The radiographic findings revealed well obturated canals with no periapical changes.



Fig-1:occlusal view after post-obturation.

Various treatment modalities were explained and conservative approach of restoring the tooth with an endocrown was decided as the treatment option, as more than half the residual tooth structure was remaining and there were no occlusal wear facets and the occlusogingival height of the remaining crown structure was approximately 4 mm.

After removal of the provisional restoration, preparation for endocrown was initiated. And undercuts were blocked using Resin modified glass ionomer cement (Fuji II LC GC ASIA). The preparation consisted of a circular equigingival buttjoint margin and central retention cavity into the entire pulp chamber constructing both the crown and the core as a single unit. The appropriate reduction of the buccal and lingual walls was done (Figure 2)



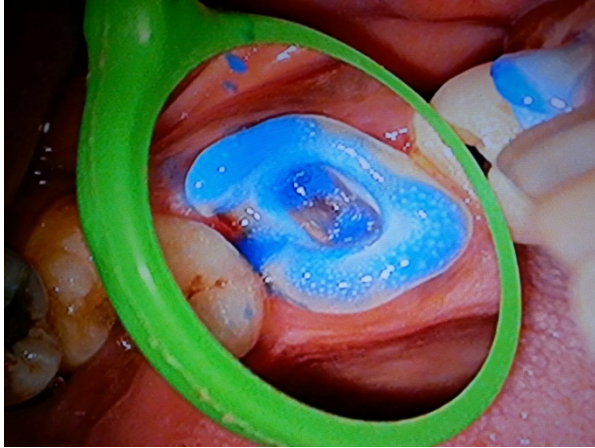
fig-2:-TOOTH PREPARATION.

Interocclusal space was checked to achieve a clearance of 2 mm. Retraction cord was placed and impressions made with polyvinyl siloxane impression material (Aquasil LV, Putty/Light Body, Dentsply, Germany) using putty wash technique.

The restoration was fabricated according to the lost wax technique of investing and wax pattern burnout followed by pressing of the ceramic ingot in the pressable furnace at a press temperature of 915–920°C. It was then finished and polished with Proxyl pink polishing paste (Ivoclar/Vivadent, Schaan/Liechtenstein). The cementation was done by resin luting agent (panavia F 2.0 kuraray japan). Follow up was done and a 6 and 18-months followup shows no signs of decementation. No recurrent caries. No fracture. No radiographic changes evident (Figures 3, 4, 5, 6, 7).



fig-3:-Endocrown.



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60 **fig-4:-Etching and cementation**

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63 **fig-5:- Final cementation.**

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fig-6:- Buccal view after cementation.



fig-7:- follow up after 18 months..

Discussion-

A successful endodontic treatment depends not only on proper obturation but proper post-endodontic restoration to integrate the pulpless tooth with the masticatory apparatus is also essential.⁵ in the era of minimal invasive dentistry teeth with more then half of the coronal tooth structure is missing, complete occlusal coverage is achieved conservatively using these newer method EndoCrown.

The various conservative treatment modalities based on the same conservative approach such as Amalcore, sharonlay for pre-molars, inlays, and onlays are based on this principle. The Amalcore, harnessed, the large and retentive contours of the root canal orifices, and the pulp chamber to provide a monoblock foundation. Inlays and onlays promoted the concept of a

supragingival finish line and conservative preparations. The endocrown is a newer esthetic and conservative addition to this continuum.

All ceramics become more popular in this era because of esthetics as well as function ⁶. Custom shaping and precise milling of ceramic restorations is now a reality which can be achieved by CAD/CAM systems and software.

The 18-month followup in the case of EndoCrown showed no esthetic and functional degradation on clinically as well as radiographic examination. These results are in agreement with the previous studies.

Bindl and Mormann demonstrated similar results in a clinical study of Cerec endocrowns shows that out of 19 endocrown Only one molar endocrown failed because of recurrent caries ⁷

Similar results were reported by **Lander and Dietschi** where a three year follow up of Empress II endocrowns shows excellent results in terms of esthetics, restoration stability, and tissue preservation ⁸.

Merits of endocrown over conventional crowns like reduced number of interfaces in the restorative system based on monoblock concepts so Stress concentration is less because of less homogenous materials. The preparation design is conservative compared to the traditional crown ⁹ so biologic width is also maintained so less damage to periodontium also. Bonding surface offered by the pulpal chamber of the endocrown is often equal or even superior to that obtained from the bonding of a radicular post of 8 mm depth. And the application and polymerization of resins is also better controlled.

In these case report to preserve the tooth structure resin modified glass ionomer cement used and to achieve a monoblock concept endocrown is cemented with resin cement. [10].

As we all know due to higher differences in elastic modulus of harder ceramic and softer dentin it has its own disadvantages such as de-bonding and risk of root fracture. So case selection is critical.

Conclusion-

Endocrown gives better retention in cases where there are minimal load and lateral stress.

References

- [1] K. Gulabivala, "Restoration of the root treated tooth," in *Endodontics*, C. J. R. Stock, K. Gulabivala, and R. Walker, Eds., pp. 279–305, Elsevier, 3rd edition, 2004.
- [2]] D. Dietschi, S. Bouillaguet, and A. Sadan, "Restoration of the endodontically treated tooth," in *Cohen's Pathways of the Pulp*, K. M. Hargreaves and S. Cohen, Eds., pp. 777–807, Elsevier Mosby, 10th edition, 2011.

- [3] V. Veselinovic, A. Todorovic, D. Lisjak, and V. Lazic, "Restoring endodontically treated teeth with all ceramic endo-crowns case report," *StomatoloskiGlasnikSrbije*, vol. 55, pp. 54–64, 2008.
- [4] D. Dietschi, O. Duc, I. Krejci, and A. Sadan, "Biomechanical considerations for the restoration of endodontically treated teeth: a systematic review of the literature—part 2 (Evaluation of fatigue behavior, interfaces, and in vivo studies)," *QuintessenceInternational*, vol. 39, no. 2, pp. 117–129, 2008.
- [5] T. S. Vinothkumar, D. Kandaswamy, and P. Chanana, "CAD/CAM fabricated single unit all ceramic post core crown restoration," *Journal of Conservative Dentistry*, vol. 14, no. 1, pp. 86–89, 2011.
- [6] Roopak Bose Carlos, Mohan Thomas Nainan, ShaminaPradhan, Roshni Sharma, Shiny Benjamin, and Rajani Rose, "Restoration of Endodontically Treated Molars Using All Ceramic Endocrowns," *Case Reports in Dentistry*, vol. 2013,
- [7] A. BindlandW.H.M'ormann, "Clinical evaluation of adhesively placed cerecendo-crowns after 2 years—preliminary results," *Journal of Adhesive Dentistry*, vol. 1, no. 3, pp. 255–265, 1999.
- [8-]E. Lander and D. Dietschi, "Endocrowns: a clinical report," *Quintessence International*, vol. 39, no. 2, pp. 99–106, 2008.
- [9] F. Zarone, R. Sorrentino, D. Apicella et al., "Evaluation of the biomechanical behavior of maxillary central incisors restored by means of endocrowns compared to a natural tooth: a 3D static linear finite elements analysis," *Dental Materials*, vol. 22, no. 11, pp. 1035–1044, 2006.
- [10] C.-L. Lin, Y.-H.Chang, and C.-A.Pai, "Evaluation of failure risks in ceramic restorations for endodontically treated premolar with MOD preparation," *Dental Materials*, vol. 27, no. 5, pp. 431–438, 2011.