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Case Study

ENDOCROWN-A UNIQUE WAY OF RETENTION-CASE REPORT

ABSTRACT

The rehabilitation of severely damaged coronal hard tissue and endodontically treated teeth is always challenging in reconstructive dentistry. The primary reason for reduction in stiffness and fracture resistance of endodontically treated teeth is the loss of structural integrity associated with caries, trauma and extensive cavity preparation rather than dehydration of physical changes in dentine.

The loss of structural integrity increases the occurrence of crown fractures and microlekage 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 mechanicallystabilize the tooth-restoration complex and increase surfaces available for adhesion[1].

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A number of options are available in every clinical situation. The choice depends on the structural integrity of the tooth, esthetic, and protective requirements[2]In this perspective; endocrowns can be considered as a feasible alternative to full crowns for restoration of nonvital posterior teeth, especially those with minimal crown height but sufficient tissue available for stable and durable adhesive[3]

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

CASE REPORT-

A 25-year-old male patient reported for the filling of his upper 1st molar. On clinical examination tooth number 16 was root canal treated one month back (Figure 1). It was asymptomatic and the occlusogingival height of theremaining crown structure was approximately 4 mm. The radiographic findings revealed well obturated canals with no periapical changes.

Fig-1: **Postobturation occlusal view showing the amount of residual tooth structure.**

A 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.

After removal of the provisional restoration, preparation for endocrown was initiated. Resin modified glass ionomer cement (Fuji II LC GC ASIA) was used to achieve a flat pulpal floor and to block the undercuts. 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)

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fig-2:-**TOOTH PREPARATION FOR ENDOCROWN.**

Interocclusal space was carefully evaluated and occlusal reduction done 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 Proxyt pink polishing paste (Ivoclar/Vivadent, Schaan/Liechtenstein). The endocrown was cemented using a resin luting agent (panavia F 2.0 kuraray japan). Clinical and radiographic evaluation was done and a 6 and 18-monthsfollowup showed no secondary caries, fracture, discoloration or loosening/decementation of the crown (Figures3,4,5,6 7).

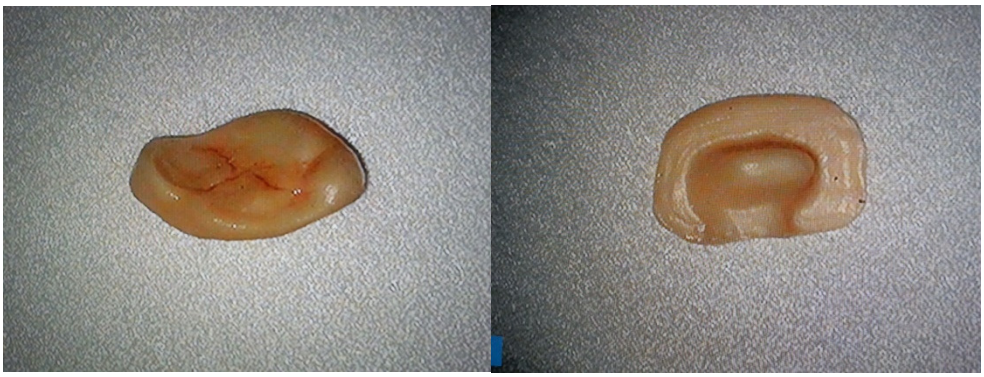

fig-3:-**Tissue surface of endocrown.**

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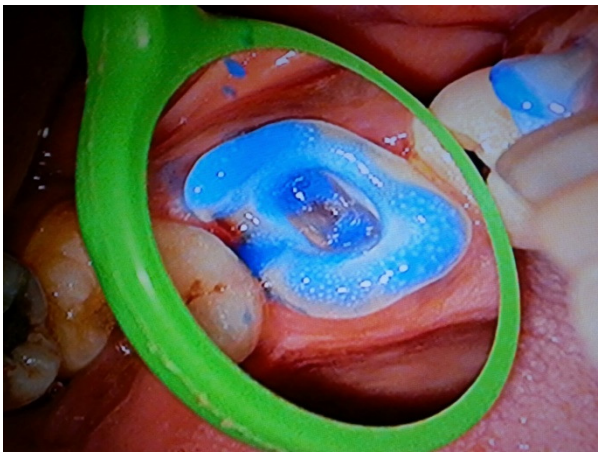

fig-4:-**Cementation**

fig-5:-**Occlusal view following final cementation.**

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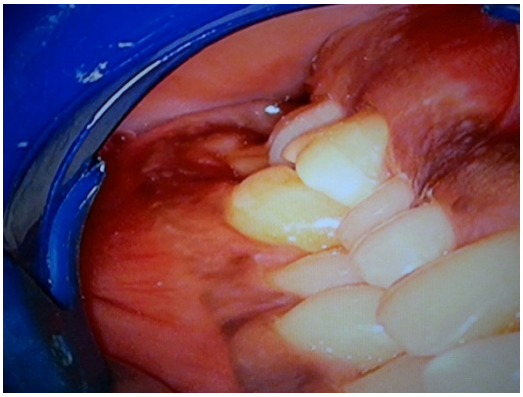

fig-6:- Buccal view of tooth 16 highlighting the excellent shade match and finish.

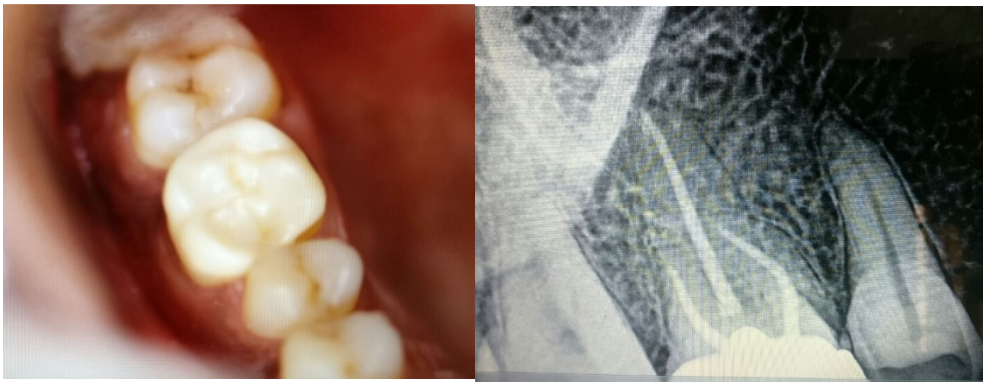

fig-7:- follow up after 18 months..

Discussion-

A successful endodontic treatment has to be complemented with an appropriate post-endodontic restoration to integrate the pulpless tooth with the masticatory apparatus.[5] When up to one half of the coronal tooth structure is missing, complete occlusal coverage is achieved conservatively using EndoCrown.

The concept of a conservative protective restoration for posterior endodontically treated teeth is not new. Amalcore, 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

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conservative preparations. The endocrown is an esthetic and conservative addition to this continuum.

All ceramic systems have gained popularity in recent times as they offer both esthetics and function [6]. The development of CAD/CAM systems and software offers several advantages in clinical practice. Custom shaping and precise milling of ceramic restorations is now a reality;

The 6-month followup in the case of EndoCrown showed no esthetic and functional degradation. These results are in agreement with the previous studies.

Bindl and Mormanndemonstrated similar results in a clinical study of Cerecendocrowns cemented adhesively. 19 endocrowns were checked (4 premolars and 15 molars) in 13patients over 28 months. Only one molar endocrown failed because of recurrent caries [7]

Similar results were reported by **Lander and Dietschi**where a three-year followup of two Empress II endocrowns showed satisfactory behavior in terms of esthetics, restoration stability, and tissue preservation [8].

Endocrowns have several advantages over conventional crowns like reduced number of interfaces in the restorative system. Stress concentration is less because of the reduction in the nonhomogenous material present. The preparation design is conservative compared to the traditional crown .[9] Involvement of the biological width is minimal. In comparison to the post and core restorations, 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. The application and polymerization of resins is also better controlled.

As presented in the case reports, instead of modifying the existing tooth structure to suit the restorative needs, resin modified glass ionomer cement was used to block the undercuts, thereby further conserving sound tooth structure. The endocrown was luted with resin cement. The adhesive monoblock system achieved reduces the need for macroretentive geometry and provides more efficient outcome and better esthetics.

Endocrowns have their own disadvantages like, debonding and risk of root fracture because of the difference in the modulus of elasticity between the harder ceramic and softer dentin. Hence case selection is critical for ensuring clinical
success with endocrowns[10].

Conclusion-

Endocrowns are indicated in cases where there are minimal functional and lateral stresses. When there is evidence of increased functional and lateral stresses as evident with steep occlusal anatomy, wear facets or parafunction, full coverage crown with or without post is the treatment of choice.

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