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End crown: an Alternative Approach for Restoring Endodontic ally Treated Molars with Large Coronal Destruction

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ABSTRACT: Restoration is one of the most important things in the field of dentistry, in restoration, there are two main things that must be considered, that was esthetic factors and functional factors. A tooth after endodontics treatment require more complex restoration than normal tooth, because lot of factors needed to be observed first, one of which is tissue residue, root canal anatomy, and even the economics condition of the patient. Post, cores, and crowns themselves have several contra indications in their use, therefore a dentist must be able to have other alternatives in the choice of restoration. Endocrown is an alternative that can be used by a dentist in performing postendodontics restoration

KEYWORDS: Actuator,Endocrown,CAD-CAM, Monoblock

I. INTRODUCTION

The ideal restoration of an endodontically treated tooth has been a widely discussed and controversial topic When a tooth is Endodontically treated, a considerable amount of tooth structure usually will be lost due to trauma or caries in addition to the central destruction created by the endodontic access preparation. This usually makes the tooth left with insufficient sound tooth structure to support casted restoration unaided. In addition to the complication in the subsequent restorations, there will be an increased chance of tooth fracture during mastication In 1980 Nayyar et al. defined amalcore or coronal- radicular restorations. The procedure implied the placement of amalgam into the pulp chamber, which will enter 2-4 mm inside the canal. The pulp chamber must have enough width and depth to contribute to restoration retention 1999, Bindle and Mörmann introduced the Endocrown technique. It was described as an adhesive crown characterized as full porcelain crowns fixed to posterior Endodontically treated teeth. Endocrown is a restorative option for an endodontically treated tooth, and it serves as a suitable alternative to the conventional post-core restoration and full-coverage restoration.

This novel approach promotes the stability and retention of the indirect restoration without the need of a cast metal core or reconstruction with intracanal post, thereby reducing the treatment time.This present case report I will be discussing about a mandibular lower molar that needed endodontic treatment and had extensive coronal destruction

II. CASE REPORT

A 26-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of decay in the lower right back tooth region. On the basis of clinical and radiographical examination, a diagnosis of asymptomatic irreversible pulpitis was made root canal therapy was initiated and completed.

Based on the amount of remaining tooth structure and thickness of the walls, a post endodontic restoration of ceramic endocrown was decided.

Two millimeters of gutta-percha was removed from the canal orifices, and the orifices were sealed using resin-modified glass-ionomer cement.

Preparation included a butt joint margin and a central retentive cavity using a coarse grit diamond-coated bur, which had a depth of 4 mm from the pulp chamber roof to the intracoronal cavosurface margin. Appropriate reduction of the buccal and lingual walls was done with a WR-13 bur so as to achieve an interocclusal clearance of 2 mm and to get a cervical margin or “cervical sidewalk” in the form of a butt joint. Removing too much tissue from the pulp chamber walls will reduce their thickness and the width strip of enamel. The depth of the cavity must be at least 3 mm.

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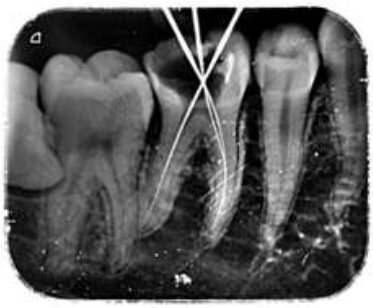


Before any intervention, selection of shade was done. An impression was made using polyvinyl siloxane impression using the putty wash technique, which was sent to the laboratory for the fabrication of prosthesis.The endocrown was fabricated in the laboratory using CAD-CAM technology and was positioned on the master cast. On receiving the prosthesis, try-in was done where the marginal integrity and the shade of the restoration were checked before cementation.

The surface of the prosthesis was etched with 10% hydrofluoric acid for 30 s, rinsed with water, and dried .Next, a coat of silane application was done for a minute.tooth surface and was etched with 37% phosphoric acid for 20 s and rinsed with water and dried,applied with adhesive, and polymerized for 20 sec with light curing A thin layer of a dual polymerizing resin was applied to the prosthetic endocrown and then was inserted into the tooth and polymerized at intervals of 5 seconds, making it easy to remove cement excesses.

After that, it was polymerized for 60 seconds on all Surface.

No occlusal discrepancy was noted, and radiographic examination revealed proper marginal adaption

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III. DISCUSSION

A proper clinical planning and decision-making is necessary for the clinical success of the post endodontic restoration of grossly destructed tooth structure.

The indications of endocrown would include molars exhibiting large coronal destruction and having short, dilacerated, or fragile roots ,limited interocclusal space , whereas its contraindications would be patients exhibiting parafunctional habits, when the pulpal chamber depth is lesser than 3 mm, cervical margin is lesser than 2 mm and in cases where proper isolation and adhesion cannot be assured.An advantageous technique as the procedure is easy; it facilitates the steps of impression taking and supragingival margins facilitate plaque control, clinical inspection, and preservation of periodontium .Also, the use of ceramic has the advantages of biocompatibility ,Monoblock nature and its wear coefficient is close to that of the natural tooth.The objective of the preparation is to get a wide and

stable surface resisting the compressive stresses that are frequent in molars . The prepared surface is parallel to the occlusal plane to provide stress resistance along the major axis of the tooth . The stress levels in teeth with endocrowns were lower than in teeth with prosthetic crowns. The pulpal chamber cavity provides also retention and stability. Its trapezoidal shape in mandibular molars and triangular shape in maxillary molars increase the restoration's stability, and additional preparation is not needed. The saddle form of the pulpal floor increases stability.This anatomy, along with the adhesive qualities of the bonding material, makes it unessential to attempt further use of post-involving root canals .In fact, the root canals do not need any specific shape; therefore, they are not fragilized by the drilling and they will not receive the stresses associated with the use of post . The compressive stresses are reduced, being distributed over the cervical butt joint and the walls of the pulp chamber Dartora et al. have evaluated the biomechanical behavior of endodontically treated teeth restored using different extensions of endocrowns A 5 mm extension presented lower intensity and a better stress distribution pattern than a 1 mm extension which presented a low fracture resistance and a high possibility of rotating the piece when in function.Butt joint designs provided a stable surface that resists the compressive stresses because it is prepared parallel to the occlusal plane. Many different materials are proposed for fabrication of endocrowns such as feldspathic porcelain, glass ceramic, hybrid composite resin, and recent computer-aided design/computer-aided manufacturing all-ceramic blocks.It has been shown that endocrowns made of lithium disilicate-based ceramics are considered among the best restorative materials because of their adhesive properties; also, they promoted micromechanical interlocking with resin cement.The addition of a uniform or no uniform ferrule to preparation increases the dentine surface available for bonding,but it has its drawbacks. Namely, according to Einhorn et al.,the addition of ferrule would enact suffcient dentine removal of the endocrown preparation, so that the entire complex would be weakened. Furthermore, areas of reduced dentine wall thickness may result in overmilling of the intaglio features of that area due to the limitations of the milling bur diameter.

Einhorn et al. investigated the consequence of the ferrule features incorporation, on molar endocrown failure and found milling limitations in reproducing the endocrowns inner surface. Hence, it was reported that the more complex the preparation design became because of the addition of ferrule, the resultant endocrown inner surface adaptation to the preparation seemed to reduce

IV. CONCLUSION

The preparation for endocrowns is simple and can be achieved quickly. Root canals are not engaged in the process, and the procedure is less traumatic than others. The supragingival position of the cervical margin protects the marginal periodontium, facilitates impression taking, and preserves the solid substance of the remaining tooth.

The endocrown represents a very hopeful treatment alternative for endodontically treated molars, it allows maintaining of tooth structure, it is compatible with goal minimally invasive dentistry, and it is adequate for the concept of biointegration. It is a conservative approach for mechanical and aesthetic restoration of nonvital posterior teeth

REFERENCES

[1]. Gupta R, Thakur S, Pandey NK, Roopa B, Fares KT. Endocrown - A Paradigm Shift in Rehabilitation: A Report of Two Cases. Contemp Clin Dent. 2021

[2]. Endocrown preparation: Review International Journal of Applied Dental Sciences 2019; 5(1): 253-256

[3]. Houda Dogui, Feriel Abdelmalek, Adel Amor, Nabiha Douki, "Endocrown: An Alternative Approach for Restoring Endodontically Treated Molars with Large Coronal Destruction", Case Reports in Dentistry, vol. 2018

[4]. Fracture Resistance and Failure Mode of Endocrown Restorations with Different Remaining Walls and Finish Lines Sara Koosha the open dentistry journal 2022

[5]. A Thorough Analysis of the Endocrown Restoration: A Literature Review April 2021 The Journal of Contemporary Dental Practice 22(4):422-426

[6]. Case Report Post Endodontic Restoration with Novel Endocrown Approach: A Case Series J res adv dent 2018