



TREATING A TRAUMATISED MAXILLARY CENTRAL INSIZOR WITH MONOBLOCK POST-CORE-CROWN RESTORATION: A CASE REPORT

TRAVMAYA UĞRAMIŞ MAKSİLLER SANTRAL KESİCİ DİŞİN YEKPARE POST-KOR-KRON RESTORASYON İLE TEDAVİSİ: OLGU SUNUMU

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ABSTRACT

Fabricating a restoration which can serve clinically long term without any sign of complication and fulfill the functional and esthetic requirement is very hard to achieve in excessively damaged tooth especially when it is in the esthetic zone. The following case report presents an alternate method for the treatment of excessively damaged tooth which can diminish the ability of complication in the traditional treatment modality and as well as can fulfill the esthetic and functional demands of the patient.

Key words: post-core, excessively damaged tooth,

ÖZET

Aşırı madde kaybı olan dişlerde komplikasyona neden olmadan uzun süre kullanılacak aynı zamanda hastanın estetik ve fonksiyonel ihtiyaçlarını karşılayabilecek bir restorasyonun yapımı özellikle hasarlı diş estetik önceliği olan üst çene ön bölgede ise çok zordur. Bu vakada aşırı harabiyete uğramış üst santral kesici dişin geleneksel tedavilere alternatif bir yöntem ile tedavisi sunulmuştur.

Anahtar kelimeler: Post-kor, aşırı hasarlı dişler

INTRODUCTION

It is a challenging clinical situation to restore excessively damaged tooth especially when there is inadequate coronal structure to provide retention and resistance for crown restoration. The problem become even more challenging if the damaged tooth is in the esthetic zone. Endodontic post and cores made from different materials with different physical and mechanical properties are used for enhancing retention and resistance of crown restorations. Among these materials are the prefabricated Zr, glass, carbon and quartz fibers and custom made cast post-cores from different alloys^{1,2}.

Suggested restoration techniques for restoring structurally compromised flared root canals are based on two conventional dowel and core systems with different design characteristics. The first system involves with the cast dowel and core that closely reproduces the morphology of the root canal

space. In the second system adhesive materials and techniques are used for the intraradicular cementation of prefabricated systems^{3,4}.

Custom made cast metal post- core is not an ideal material when esthetic is a primary concern. Thus all ceramic restorations supported by prefabricated fiber or Zr post and composite core have gained popularity in this regard due to their esthetic properties.

A Richmond crown also called "porcelain faced dowel crown" which is a post retained crown made for an endodontically treated tooth using a porcelain facing, has been suggested as an alternate restorative technique for treating fractured anterior teeth⁵. The following case report present a method by which such teeth can be restored with modified Richmonds crown fabricated from Li-disilicate ceramic (IPS Empress E-max). Such an all ceramic single unit post-core-crown restoration can help in the esthetic and functional rehabilitation of excessively damaged anterior teeth.

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CASE

20 years old male applied to our clinic suffering from maxillary anterior teeth fracture following a sport injury. Clinical examination revealed an oblique fracture of the maxillary left central and lateral incisors. Vitality tests (thermal and electric pulp test) and radiographic examination were carried out. The traumatized teeth were diagnosed as nonvital and root canal treatment was advised. Based on the patient's esthetic requirement, considerations of remaining coronal tooth structure and occlusion, a decision of post endodontic restoration with Li-disilicate ceramic single-unit all-ceramic post-core-crown was reached for central incisor. Lateral incisor was treated with traditional fiber post, resin core and all ceramic crown. The nature of the procedure and possible discomforts and risks had been explained to the patient.

Root canal treatment was performed under rubber dam isolation. Cleaning and shaping of the canal was made to size 60 K-file accompanied by copious irrigation with 1% sodium hypochlorite and obturation was done with gutta-percha and AH-Plus sealer (Dentsply DeTrey, Konstanz, Germany) by lateral condensation technique. Gutta-percha was removed with a heated endodontic condenser and post space prepared using Peeso Reamers sizes 1 to 4 while ensuring 4 mm of remaining apical gutta-percha for adequate apical seal(Fig. 1).



Figure 1. Fractured tooth and prepared post space.

The impression of the post space was taken with self curing acrylic resin (Pattern resin, Gc America inc. ALSIP, IL 60803 USA). Prior to impression the post space was isolated with petroleum jelly for easy removal of the polymerised acrylic resin from the root canal. Preparation of the remaining tooth and acrylic resin-core was made with diamond burs with a chamfer finish line(Fig.2).



Figure 2. Creating a retentive button to the core ensured the immobilisation of the resin post- core in the final silicone impression.

Following gingival retraction, impression was taken with additional type silicone material(Panasil, Kettenbach GmbH&Co.KG Eschenburg, Germany). Impression was poured with type IV dental stone(Fig.3).



Figure 3. Acrylic resin post-core in silicone impression and master stone cast.

Stone cast model was prepared and mounted to a semi adjustable articulator (Denar Advantage, Whip mix Corporation, USA). When acrylic resin post was in stone model, wax pattern of the crown substructure was built up on it and the assembly was cast with Li-disilicate ceramic(Fig.4)



Figure 4. Li-disilicate post-core.

After checking marginal fit, the substructure was veneered with veneering ceramic to give a lifelike appearance. The finished restoration was evaluated for fit, shade, and occlusion prior to cementation, gingival retraction cord was placed, and then the restoration was luted with a dual cure composite luting agent (Panavia F, Kuraray medical Inc, Okayama, Japan). The excess luting agent was removed with a scalpel and all accessible margins were finished using fine diamonds and polished with rubber points and diamond polishing paste. The cemented restoration was evaluated clinically and radiographically for marginal fit (Fig. 5)



Figure 5. Finished post -core – crown restoration.

DISCUSSION

The increasing demand for the esthetic materials such as all-ceramic restorations have gained popularity especially restoring maxillary anterior teeth⁶. The high-strength ceramics allow fabrication of restorations with optimal esthetics, good biocompatibility, excellent periodontal tissue response, as well as the necessary mechanical properties to withstand functional stresses⁷. Moreover the improved potential of these silisium based ceramics to bond to enamel and dentin has made metal-free restorations clinically acceptable⁸. The case report presented take

advantage of the properties of ceramics to create an all-ceramic foundation restoration and crown as a single-unit restoration.

The need for support from the root canal is crucial for retention and resistance for withstanding functional loads for excessively damaged teeth⁹. In this case there was 2.5 mm of undamaged sound dentin and the authors decided to restore the tooth with crown supported by post-core.

Excessively damaged teeth generally have been restored with prefabricated fiber or prefabricated Zr post or cast metal post-cores with porcelain fused to metal (PFM) crowns¹⁰. Cast metal post-core is not an ideal material choice for maxillary anterior teeth when all ceramic crown are planned for restoration since the exposure of greyish color beneath all ceramic crown. Using prefabricated Zr and fiber post and resin cores could be a good choice because of their esthetic properties. However it is well documented that using Zr and fiber post cores as a foundation of crown may cause failures such as loss of adhesion between crown and core, loss of adhesion between core and tooth, loss of adhesion between post, canal and core and root fractures¹¹. Li-disilicate base ceramics with its inherent silisium content have superior bonding ability to dentin and resin cement⁸. In this case the authors used Li-disilicate ceramics for decreasing the possibility of debonding. Moreover creating a monoblock restoration could prevent the failures between post-core and crown¹².

Cementing post-cores with a dual cure resin cement with total etch bonding technique is advised because of its superior adhesive properties¹³. Its dual cure ability ensures the polymerisation of cement even in the apex of the post canal. Although cementing post with total etching is technique sensitive application, it increases the bonding ability of post to the root canal¹⁰. In this case the restoration was cemented with a dual cure resin cement with total etch technique for decreasing debonding from root canal.

Case presented in this report have been followed up over a period of 1 year with no evidence of fracture, debonding or change in esthetic qualities (Fig.6).



Figure.6.Restoration after 1 year.

However long-term follow-up and clinical studies will need for reliability of this new restorative strategy. As a result the all-ceramic single-unit post-core-crown restoration is a promising treatment modality for the esthetic restoration of severely damaged anterior teeth

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