

Using an Existing Crown to Repair a Damaged Cast Post and Core Restoration

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Abstract:

A fractured coronal tooth structure beneath an intact crown is a common clinical occurrence. If the underlying root is healthy, the tooth is restored with a post and core followed by refabrication of the crown. This paper describes a technique of using the existing intact crown for the above-mentioned situation. A 34-year-old female was referred with a fractured right canine with an intact crown. A post was found fractured in the canal which was subsequently retrieved. A new fiber post was cemented in the post space followed by adaptation of 50 µm polytetrafluoroethylene (teflon) tape on the tissue surface of the crown. Dual-cured core build-up composite resin was injected into the crown and adapted to the fractured tooth. On curing and removal of the crown, a new composite resin core was found bonded to the tooth structure. The Teflon tape was removed from the crown, and the crown cemented to the core using glass ionomer cement. This technique of building up the core of the tooth using teflon tape adapted to the tissue surface of the crown was found to be successful even after 1 year of follow-up.

Key Words: Fracture of coronal tooth structure, intact existing crown, polytetrafluoroethylene tape, teflon tape

Introduction

Endodontically treated teeth restored with post and core face failure due to loosening of the post, fracture of the post or the root itself.¹ The common post and core complications documented were post loosening (5%), root fracture (3%), caries (2%),

and periodontal disease (2%).² Fracture of the coronal tooth structure can occur on anterior teeth as they are subjected to shear stresses. Very often the post and core fails, leaving behind an intact crown. Root may have adequate bone support and which could be favorably used if the post is retrieved. Making use of the existing crown makes the treatment more challenging. This clinical report describes the technique of refabricating post and core to match the features of the existing crown.

Technique

1. A 34-year-old female patient reported with fractured maxillary right canine tooth (Figure 1). On examination, it was found that the tooth was the root canal treated and restored with a cast post and core and a metal ceramic crown over it (Figure 2). The core was fractured leaving the cast post embedded in the root.
2. The post was loosened using ultrasonic vibrations and retrieved using an artery forceps. The residual cement in the post space was removed and a fiber post of diameter 1.5 mm (Flexi-Post, ColteneWhaledent) was bonded using dual-cured composite resin (Paracore, ColteneWhaledent) (Figure 3).
3. The crown was intact, and it was decided to use the same for restoring the fractured tooth. A 50 µm polytetrafluoroethylene (PTFE) (teflon) tape was adapted on the tissue surface of the crown and a dual-cured core build-up composite resin (Paracore, ColteneWhaledent) was injected into the crown and positioned over the bonded post (Figures 4-6). It was then light polymerized for 40 s.
4. The crown was then removed leaving the core bonded to the post and the tooth structure. The core was light



Figure 1: Fractured right maxillary canine.

polymerized again for 40 s. The teflon tape was removed from the crown, and the crown was cemented to the core using glass ionomer cement (GIC gold label glass ionomer luting and lining cement) (Figure 7). The patient was followed up for 1 year, and it was uneventful.

Discussion

The need for retreatment of a tooth and/or prosthetic restoration may arise due to secondary caries, pulpal involvement, trauma to

the restoration, and/or foundation, and subjective desires for a more aesthetic or durable restoration. Crowned teeth requiring retreatment due to fracture of the underlying tooth structure and/or foundation restoration often possess an undamaged extracoronary restoration. In such cases, it may be desirable to reuse the restoration for the sake of cost and time.³

A badly distorted endodontically treated tooth is always a challenge for any dentist. Chiche *et al.* presented a comprehensive literature review over this topic and described his own way to handle these emergencies. He inserted a prefabricated plastic post into the palatal canal of a maxillary molar. Later on following an impression of the remaining tooth, already prepared for a crown was taken with a plastic post. A gold post cast from the plastic post was inserted into a fresh fabricated crown, followed by crown cementation.⁴ An indirect fabrication of two separate castings, first for the post and then fabricating the core for mandibular molars was suggested by Sadan *et al.* This technique was similar to Chiche's technique but worked on indirect fabrication method.⁵

Cast post core systems accumulated stress within cast post cores and apical one-third region of the tooth. Using fiber posts, the stresses were distributed to the cervical one-third region of



Figure 2: Intact metal ceramic crown.



Figure 3: Glass fiber post bonded to tooth.



Figure 5: Crown adapted to the tooth with composite resin.



Figure 4: Adaptation of teflon tape to existing crown.



Figure 6: Core build-up with composite resin.



Figure 7: Crown cemented using glass ionomer cement.

the tooth and the supporting bone. Specimens restored with fiber-reinforced post systems offered more homogenous stress distribution than cast posts as fiber posts possess a similar modulus of elasticity to that of dentin.^{6,7} Hence, it was decided to use a glass fiber post for this case. The use of PTFE tape provides a space of approximately 50 μm , which was used to accommodate the cement.⁸

Conclusion

In this paper, the most common difficulty in the clinical practice has been discussed. Restoration for the endodontically treated teeth, where there is hardly no proper support for the post makes the work for the clinicians more complicated and challenging. This paper describes a novel technique for

refabricating a post and core restoration for an existing crown using polyfluoroethylene tape.

References

1. Kroll RG. The reinforced composite post and core. *J Am Dent Assoc* 2000;131(5):667.
2. Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JY. Clinical complications in fixed prosthodontics. *J Prosthet Dent* 2003;90(1):31-41.
3. Bhandari S, Rajagopal P, Bakshi S. An interdisciplinary approach to reconstruct a fractured tooth under an intact all ceramic crown: Case report with four years follow up. *Indian J Dent Res* 2011;22(4):587-90.
4. Chiche G, Weaver C, Pinault A. Divergent post and tube and screw systems for the short crown preparation. *Quintessence Int* 1990;21(10):813-20.
5. Sadan A, Elliot R, Raigrodski AJ. Treatment planning extensively broken-down mandibular molars for post-and-core fabrication. *Quintessence Int* 1998;29(6):351-5.
6. Eskitascioglu G, Belli S, Kalkan M. Evaluation of two post core systems using two different methods (fracture strength test and a finite elemental stress analysis). *J Endod* 2002;28(9):629-33.
7. Salameh Z, Tashkandi E, Ounsi HF, Aboushelib MN, Omar R. Fracture resistance and failure pattern of endodontically treated maxillary premolars restored with fiber reinforced and cast posts and cores. *Int Dent SA* 10(1):12-8.
8. Wadhvani C, Piñeyro A. Technique for controlling the cement for an implant crown. *J Prosthet Dent* 2009;102(1):57-8.