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Case Report

Benefits of using fiber post and core to restore decaying teeth: a case report and analysis

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ABSTRACT

The post and core approach works best for treating teeth with short clinical crowns that are insufficiently strong to sustain the final restoration. The widespread acceptance of fibre posts can be attributed to their advantages over traditional metallic post materials. Additionally, fibre posts' mechanical and aesthetic advantages have given them popularity in the dental industry. Additionally, the outcomes of a few clinical trials have given therapists confidence to employ the fibre posts. For the previous six months, the primary complaint of a 23-year-old guy had been decaying teeth in the upper front area. On both sides of the maxillary central and lateral incisors, deep proximal caries was discovered. Because of the poor remaining crown structure and crown placement, the proposed course of treatment involved root canal therapy for all four teeth, followed by post and core for 11, 21, and 22. One of the many problems caused by anterior teeth decay is appearance. When such teeth are restored with glass fibre posts as opposed to the more traditional post core technique, the patients have better results over an extended period of time with fewer appointments. Glass fibre restorations, as opposed to the more conventional post core procedure, yield superior outcomes over a longer length of time and require fewer consultations.

Keywords: Fiber Post and core, Cast post and core, Aesthetic post

INTRODUCTION

A post and core as well as a full coronal repair are typically needed for teeth with considerable coronal structural loss.[1,2] When there is not enough tooth structure left to hold the core material in place, posts are required to provide retention.[3,4] Various post systems have been employed, such as fibre posts, zirconia ceramic posts, stainless steel posts, titanium posts, and cast post and cores. Fibre posts and other aesthetic posts are required since anterior aesthetic restorations are becoming more and more common.[5] The clinical protocols for Endodontically treated teeth have significantly changed since the introduction of fibre posts. Research into changing the fibre type (from carbon to quartz to glass) and post form of these items has been ongoing since their introduction at the start of the 1990s.[6] The advancement of technology has made it possible for producers to offer fibre posts that are radiopaque, come in a wide range of shapes, and have better mechanical and aesthetic qualities than metal or cast posts-qualities that were initially recognised.[7-9]Because prefabricated fibre posts have a low modulus of elasticity (about 20 GPa), they can absorb stress and guard against root fracture.[10] This property is similar to that of dentin. Prefabricated fibre posts used in tooth restorations may be more resistant to fracture propagation than cast metal or titanium posts.[11] Four anterior teeth are treated in this case study with a porcelain restoration bonded to a metal crown and fibre post.

CASE REPORT

A 23-year-old man's main complaint had been decaying teeth in the upper front area for the past six months. (fig 1) Following clinical and radiographic examinations, deep proximal caries was found on both sides maxillary central and lateral incisors. The course of treatment planned was root canal treatment of all 4 teeth followed by post and core surgery with 11,21,22 due to inadequate remaining crown structure and crown placement. In order to obtain direct access to the pulp in all four teeth, an access cavity was made with the aid of a round bur. The working length was measured, and up to file number 25, the canals were prepared. For irrigation, 3% sodium hypochlorite and regular saline solution were utilised. The canals were obturated with AH plus sealer in a single cone procedure following the acquisition of a master cone radiograph.

Gutta percha was removed from the root canal with gates drills, leaving 4-5 mm of unbroken gutta percha apically (Figure 3a, 3b). The adaptability of the No. 3 fibre post (Para Post Fibre Lux No. 5/Taper Lux, Coltene/Whaledent Inc, Cuyahoga Falls, OH, USA) within the root canal was examined. The fibre posts were luted using a dual-curing composite resin (Variolink II, Ivoclar Vivadent AG, Liechtenstein) in accordance with the manufacturer's instructions.

Figure 1: Pre-operative.

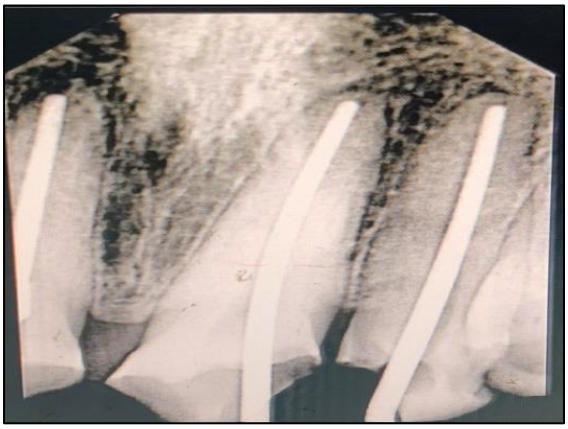

Figure 2: Obturation with master cone.

Figure 3 (a and b): Post space preparation.

Figure 5: Composite core builds up.

Figure 6: Crown cementation.

To receive porcelain fused to metal crowns, core build up using composite resin was done (Figure 5). A ferrule formed at the coronal edge as a result of the preparation. The cervical finish line was continuous, well-defined, and unambiguous, with all angles rounded off. When the crowns were prepared, dual cure resin cement was used to cement them (Figure 6). In order to improve hygiene and prevent biofilm retention in the cervical region, excess cement was removed following cementation. The cervical edges of indirect restorations and the gingival health were assessed.

DISCUSSION

The dentist's ongoing challenge following endodontic therapy is to restore the crown and maintain the tooth as a long-lasting, useful, and aesthetically pleasing component of the masticatory apparatus. While endodontic therapy preserves the tooth, it weakens the tooth relative to a healthy, normal tooth. Loss of moisture, loss of structural integrity after endodontic access preparation, and modifications in collagen cross-linking are frequently blamed for these physically impacted pulpless tooth characteristics.[12] Many writers proposed that one effective way to restore lost strength in teeth that had undergone endodontic treatment was to reinforce the tooth. Extra-coronal reinforcement (crown) and intracoronal reinforcement (post and core) are two possible forms of this type of reinforcement.[13–14]

The conventional and time-tested technique for repairing teeth that have undergone endodontic treatment is the cast metal post and core. The traditional post and core systems do have certain drawbacks, though, include inadequate post retention, a higher chance of root fracture, and corrosion when using different metals in the system. Cast metal post and core fabrication can be labour-intensive and expensive in the lab. Errors in casting could be introduced by the laboratory process itself, raising the possibility of failures. The application of a cast post frequently increases the risk of harm to remaining tooth structure by promoting more tooth structure loss that could impair the teeth's ability to withstand force. Posts should have as many of the following clinical characteristics as possible: high radiographic visibility, biocompatibility, maximal retention within the root and retrievability, maximal protection of the crown margin seal from coronal leakage, maximal retention of the core and crown, and maximal protection of the root from fracture.

A post that possesses the perfect balance of strength, flexibility, stiffness, and resilience would be perfect. The capacity to flex elastically under pressure without suffering long-term harm is resilience. While it is a useful feature in endodontic posts, a thin post's capacity to hold the core and crown under functional stresses is compromised by excessive flexibility. A material's stiffness indicates its capacity to withstand deformation under stress. Regardless of size, a material's basic physical characteristic is its stiffness. However, a post's actual flexibility is determined by its material's modulus of elasticity as well as its diameter. Compared to posts of the same diameter with a higher modulus of elasticity, posts with a lower modulus of elasticity are more flexible. Although low modulus posts break at lower levels of force than high modulus posts, posts made of non-stiff materials (low modulus of elasticity) are more durable, absorb more impact force, and transmit less force to the root than stiff posts. Glass fibre posts are the most often utilized because they comply with the greatest number of these factors.[15]

CONCLUSION

Anterior teeth decay causes a host of issues, one of which is aesthetics. In contrast to the traditional custom post core procedure, restoration of such teeth with glass fibre posts yields good outcomes for the patients for a long period with little appointment.

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REFERENCES

1. Peroz I, Blankenstein F, Lange KP, Naumann M. Restoring endodontically treated teeth with posts and cores-a review. Quintessence Int 2005;36: 737-46.
2. Ferrari M, Cagidiaco MC, Grandini S, De Sanctis M, Goracci C. Post placement affects survival of endodontically treated premolars. J Dent Res 2007;86: 729-34.
3. Schwartz RS, Robbins JW. Post placement and restoration of endodontically treated teeth: a literature review. J Endod 2004;30:289-301.
4. Goodacre CJ, Spolnik KJ. The prosthodontic management of endodontically treated teeth: a literature review. Part I. Success and failure data, treatment concepts. J Prosthodont 1994;3:243-50.
5. Duret B, Reynaud M, Duret F. Un nouveau concept de reconstitution corono-radiculaire: le composiposte (1). Chirurg Dent France 1990;540:131-141.
6. Asmussen E, Peutzfeldt A, Heitmann T. Stiffness, elastic limit, and strength of newer types of endodontics posts. J Dent 1999;27:275-278
7. Drummond JL, Toepke RS, King TJ. Thermal and cycling loading of endodontic posts. Eur J Oral Sci 1999;107:220-224.
8. Fredriksson M, Astback J, Pamenius M, Arvidson K. A retrospective study on 236 patients with teeth restored by carbon fiber-reinforced epoxy resin posts. J Prosthet Dent 1998;80: 151-157.
9. Mannocci F, Ferrari M, Watson TF. Intermittent loading of teeth restored using quartz fiber, carbon-quartz fiber, and zirconium dioxide ceramic root canal posts. J Adhes Dent 1999;1:153-8.

10. Lassila LV, Tanner J, Le Bell AM, Narva K, Vallittu PK. Flexural properties of fiber reinforced root canal posts. Dent Mater 2004;20:29-36
11. Isidor F, Odman P, Brondum K. Intermittent loading of teeth restored using prefabricated carbon fiber posts. Int J Prosthodont 1996;9:131-6.
12. Goodacre CJ, Spolnik KJ. The prosthodontic management of endodontically treated teeth: A literature review. Part I. Success and failure data, treatment concepts. J Prosthodont 1994;3:243-50.
13. Silverstein WH. The reinforcement of weakened pulpless teeth. J. Prosthet Dent 1964;14:372-81.
14. Rosen H. Operative procedures on mutilated endodontically treated teeth. J Prosthet Dent 1961;11:973-86.
15. Hargreaves, Kenneth M. BLH, Cohen's pathways of the pulp Eleventh Edition. Elsevier; 2016:1143.
16. Belli S, Eskitascioglu GÜ. Biomechanical properties and clinical use of a polyethylene fibre post-core material. International Dentistry South Africa. 2006;8(3):20-6.

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