Strategic management of chronic pulpitis with post and core restoration: A clinical approach to anterior tooth rehabilitation.

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Abstract

Chronic pulpitis is a prevalent condition that often results in significant tooth structure loss, necessitating restorative treatments. For teeth with extensive damage, post and core restorations are essential to restore both functionality and aesthetics. These procedures are particularly important in providing structural support for crowns (Sorensen & Martinoff, 1984). The use of fiber-reinforced posts has gained popularity due to their excellent biocompatibility, high adhesive strength, and superior stress distribution, making them ideal for endodontically treated teeth (Schmidlin et al., 2008). This case report details the stepwise management of chronic pulpitis through post and core restoration.

Keywords: Chronic pulpitis, post and core, fiber post, composite core buildup, full veneer crown.

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Introduction

Chronic pulpitis is a common dental condition resulting from irreversible pulp damage, often leading to significant loss of tooth structure. Endodontic treatment is frequently required to remove the infection and preserve the tooth. However, after root canal therapy, it is crucial to restore the tooth's function and aesthetics, particularly in cases where the tooth has undergone extensive structural damage. These restorative procedures are especially vital for anterior teeth, which require both functional restoration and an aesthetically pleasing outcome.[1] In such situations, post and core restorations are essential to support the tooth for the placement of a final crown.Post and core restorations serve as an effective solution for reinforcing the tooth and enhancing the retention of the crown.[2] Fiber-reinforced posts, which have superior biocompatibility, higher bonding strength, and better stress distribution compared to traditional metal posts, have become the material of choice for endodontically treated teeth.[3] Fiber posts also provide a distinct advantage in terms of aesthetics, as their translucency and color blend well with natural tooth structures, particularly in the visible anterior region.[4] This case report highlights the clinical management of chronic pulpitis using a post and core restoration approach, emphasizing the procedural steps and the benefits of fiber-reinforced posts. [5]

Case report

A 36-year-old male patient, Ritik Kumar , visited the clinic with the chief complaint of a dislodged restoration in the upper right front tooth region (#11). The patient reported mild sensitivity but no significant pain or swelling. His medical history was unremarkable, with no known allergies or systemic conditions.

On clinical examination, tooth #11 exhibited a dislodged composite restoration and visible decay along the margins (Figure 1). Radiographic examination, including periapical X-rays, showed extensive radiolucency involving the enamel, dentin, and pulp, consistent with chronic pulpitis. Importantly, no periapical pathology was detected, indicating that the infection was confined to the pulp and had not spread to the surrounding bone. With the diagnosis of chronic pulpitis in tooth #11 confirmed, the treatment plan was developed, which included root canal therapy followed by post and core restoration to rebuild the tooth structure and provide support for the final crown. The root canal procedure was performed under local anesthesia. After the removal of pulp tissue, the root canals were thoroughly cleaned, shaped, and sealed using gutta-percha and a resin-based sealer.

Following the root canal, post space preparation was the next step. To maintain a sterile environment, a rubber dam was placed. Piezoelectric reamers were used to carefully prepare the post space, ensuring an adequate fit for the fiber post while preserving as much of the natural tooth structure as possible (Figure 2). After ensuring the post space was prepared correctly, a prefabricated fiber post was chosen based on the dimensions of the prepared space. The post was tried in place and verified radiographically to confirm the correct fit (Figure 3).
Next, the dentin surface was etched with 37% orthophosphoric acid for 15 seconds to prepare it for bonding. The fiber post was then cemented using dual-cure resin cement, followed by light curing for 20 seconds to secure the post firmly in place. Core buildup was performed using composite resin to restore the tooth's natural anatomy and provide support for the final restoration. Excess material was trimmed using a diamond disc, and a full veneer crown was fabricated and cemented after confirming the fit and occlusion.

Discussion

Chronic pulpitis is a condition that, if left untreated, can lead to significant loss of tooth structure. Endodontic therapy is typically the first step in managing this condition; however, in cases of extensive tooth damage, a post and core restoration is required to provide structural support for the final restoration. Post and core restorations are especially important for teeth that have undergone root canal treatment and have lost significant coronal tooth structure, as they help restore both function and aesthetics.[1,2]

Fiber posts have become a popular choice in such restorative treatments due to their numerous advantages over metal posts. They are highly biocompatible and bond well with dentin, which contributes to a strong and durable connection between the post and the tooth.[3] This bonding enhances the overall retention of the restoration, reducing the chances of post failure (Schmidlin et al., 2008). Additionally, fiber posts distribute the forces of mastication more evenly across the root, reducing the risk of root fractures—an issue commonly associated with metal posts (Hämmerle et al., 2003).[4]

Fiber posts are tooth-colored and translucent, providing a more natural appearance compared to metal posts, which can create dark lines at the gingival margin. Furthermore, the use of piezoelectric reamers for post space preparation ensures minimal loss of tooth structure while achieving a precise fit for the post.[6] The composite core material offers a strong foundation

for the final crown, ensuring that the restoration is both functional and aesthetically pleasing.[7] A significant advantage of fiber posts, particularly in anterior teeth, is their aesthetic quality.[8]

Conclusion

This case report illustrates the effectiveness of a stepwise approach to managing chronic pulpitis with post and core restoration, followed by the placement of a full veneer crown. Fiber-reinforced posts offer numerous advantages, including improved biocompatibility, better bonding to dentin, and more even stress distribution, making them an excellent choice for restoring anterior teeth after endodontic treatment.[9] The use of piezoelectric reamers for precise post space preparation, along with composite resin for core buildup, ensures a strong and durable foundation for the final crown.[10] With careful execution, this approach provides long-lasting functional and aesthetic outcomes for patients with severely compromised teeth.

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FIGURES

Figure 1

Figure 2

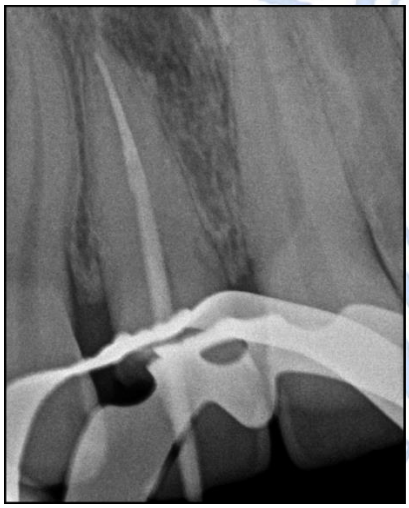

Figure 3

Figure 4