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RESEARCH ARTICLE

FIBRE REINFORCED COMPOSITE FOR RESTORING ELLIS CLASS II FRACTURE - A CASE REPORT

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ABSTRACT

The loss of anterior tooth structure affects patient's esthetics and hampers his psychological and social well being. The reconstruction of structurally compromised anterior teeth is rather a challenging procedure for a Dentist. A conventional build up technique using composite resin restoration alone can fulfill the esthetic requirement, but the strength is still compromised. This has drawn the attention of the researchers to design a biomimetic material which can replace dentin and reconstruct the tooth to its utmost natural appearance and strength. The following case report presents a technique of reinforcing a traumatized vital anterior tooth (representing Ellis Class II fracture) with a fibre reinforced composite resin.

INTRODUCTION

In dental practice, the most disruptive and distressing emergencies are traumatic dental injuries. The most common type of dental trauma that affects children and adolescents is fractures of the coronal portion of the anterior teeth. 18-22% of dental traumas involve coronal fractures of permanent incisor, of which 96% involve the maxillary central incisors. The treatment of coronal tooth fractures is influenced by a number of different factors. As a result, it is critical for dentists to restore and reconstruct a tooth in a way that is both aesthetic and functional, while also preserving the dental arch's integrity. Various methods have been developed over time for reconstructing fractured teeth. The case described in this article illustrates a recently developed approach for treatment of anterior tooth fracture. The successful restoration of an anterior tooth that has been traumatized necessitates the restoration of the proper anatomical form, rehabilitation of function by achieving good strength, and acceptable esthetics. This biomimetic material primarily reduces composite microleakage, improves flexural strength, and protects teeth from fracture. The most prevalent method of reinforcement for composite resins in dental practice is using glass fibers.

Boron, ceramic, aramid, carbon/graphite, and metal fibers are other options¹. The fiber reinforcement can be made of short fibers or long fibers (the core has more fibers). A novel approach to restoring a straightforward Ellis Class II fractured maxillary anterior tooth using fiber-reinforced composite, which can be done in a single chairside visit, is demonstrated in this case study.

CASE REPORT

A 25-year-old male patient presented to the Department of Conservative Dentistry and Endodontics at the Government Dental College and Hospital, Aurangabad, Maharashtra with a chief complaint of a fractured upper right front tooth. The patient wanted to reconstruct the portion of the tooth that was fractured for the purpose of improving his appearance. Two years prior, the patient had suffered trauma from a fall. It was classified as Class II (uncomplicated) fracture with respect to 11. The tooth was asymptomatic. Electric pulp test revealed healthy pulp tissue with respect to 11. The absence of periapical pathosis was confirmed by an intraoral periapical radiograph.

The remaining tooth structure was severely compromised and could not be restored using only conventional composite resin. As a result, the composite resin restoration was chosen in conjunction with the fiber-reinforced restoration method.



Pre-operative photograph

Treatment Plan: Using a round-ended, tapered carbide bur, a 45-degree bevel was placed labially to remove the unsupported enamel and increase the surface area. Following this, one groove was placed palatally using No. 245 straight fissure carbide bur. The groove was placed along the distal line angle with respect to 11. Likewise the groove was also placed parallel to the long axis of the tooth. Using the VITA shade guide, the correct shade selection was done. This was followed by etching with 37% phosphoric acid, application of 5th generation bonding agent and curing for 20 seconds.

**PALATALVIEWSHOWINGPLACEMENTOFTWOPALATAL
LYPLACEDGROOVES**



**DIMENSIONSOFPALATALLYPLACEDGROOVES:(2×1×0.8)
mmi.e.,length× breadth×depth**



**APPLICATION OF BONDING AGENT AND CURING FOR 20
SECONDS**

Following this, four-millimeter-long interligfibers were inserted into the parallel groove.



ETCHINGOFPALATALSURFACE





PLACEMENT OF INTERLIG FIBRE SPALATALLY



POST-OPERATIVE PHOTOGRAPH

Finally, the tooth was restored with a packable composite resin.

The process of finishing and polishing was completed.



POST-OPERATIVE PHOTOGRAPH



PRE-OPERATIVE PHOTOGRAPH

DISCUSSION

In order to restore the tooth's form, function, and aesthetics, the loss of anterior tooth structure necessitates immediate treatment. When treating simple or even complex fractures, fibre reinforced composite restoration is a superior, more advanced option. In present case, considering age, esthetic requirement and longevity of restoration, fibre reinforcement was planned, which not only increases the strength but also the span of restoration.

CONCLUSION

Since restoring a fractured tooth is a complicated process in which strength is often a limiting factor, interlig fiber restorations provide greater strength, excellent aesthetics, and an extended lifespan.

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