

Restoration of Traumatized Anterior Teeth Using Fibre Reinforced Composite Resin: A Case Report

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Abstract: *Fracture of the anterior teeth by dental trauma is a common type of dental injury. Most of the times these injuries involve the maxillary incisors because of their position in the dental arch. It affects function and speech of patient as well as the emotional and psychological wellbeing due to aesthetic concerns. A conventional restoration using composite resin can fulfill the esthetic requirement, but the strength is still compromised. This has drawn the attention of the researchers to design a material which can replace dentin and reconstruct the tooth structure to its optimal natural appearance and strength. This case report presents aesthetic rehabilitation of fractured vital maxillary anterior teeth (Ellis class II fracture) using fibre reinforced composite resin.*

Keywords: Fibre Reinforced Composite, traumatized vital anterior tooth, aesthetics, dentinal grooves

1. Introduction

Traumatic dental injuries are one of the most disruptive and distressing emergencies in dental practice¹. Uncomplicated crown fracture of the permanent teeth has an intense effect on the patient's appearance and function. Coronal fractures of permanent incisors account for 18 - 22% of all dental traumas, among which 96% incidence seen with maxillary central incisors.

As the presence of fractured anterior teeth severely compromises the aesthetic value of the patient, it requires quick functional and aesthetic repair². Though conventional composite resin restoration is used for rehabilitation of such cases, it has some limitations in compromised tooth fractures like extensive angle fractures³.

Fibre - reinforced composite was first described by Smith in the 1960s. Fibre - reinforced composite (FRCs) restorations are resin-based restorations containing fibres which are aimed at enhancing its physical properties⁴. This material consists of fibre material held together by a resinous matrix which improves the flexural strength thereby protects the teeth against fracture and also it reduces microleakage of composites⁵. Glass fibre reinforcement of composite resins is the most common reinforcement technique used in dental practice. Also Carbon/graphite, boron, ceramic, aramid and metal fibres can be used⁶.

This case report presents a novel technique to restore an uncomplicated fractured maxillary anterior teeth (Ellis Class II fracture) with fibre reinforced composite which is quite economical and a single visit chairside procedure.

2. Case Report

A 20-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of fractured upper front teeth and wanted to restore the fractured portion for aesthetic concern. Patient gave history of trauma 2 months back due to fall from a bike. Clinical examination revealed Ellis Class II (uncomplicated) fracture to 11, 21, 22. The teeth (11, 21, 22) were asymptomatic without any associated injury to the surrounding hard or soft tissues and responded normal to electric pulp test. Teeth were non tender on percussion. Intraoral periapical (IOPA) radiograph showed non - involvement of pulp and confirmed the absence of periapical pathosis. The remaining tooth structure of 21 was quite compromised for restoring with conventional composite resin restoration alone. So it was decided to use fibre reinforced restoration technique i. e. placement of interlig fibres followed by composite resin restoration with 21 and conventional composite resin restoration with 11 and 22.

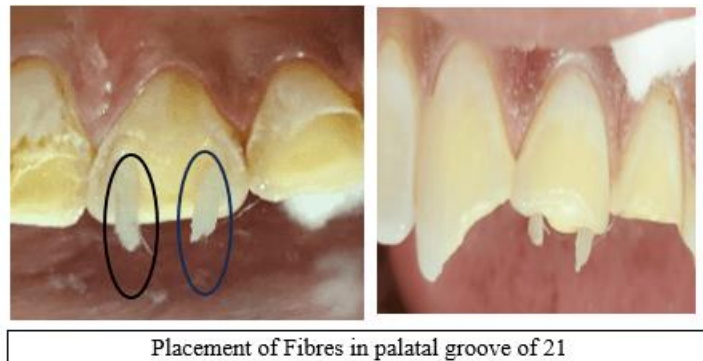
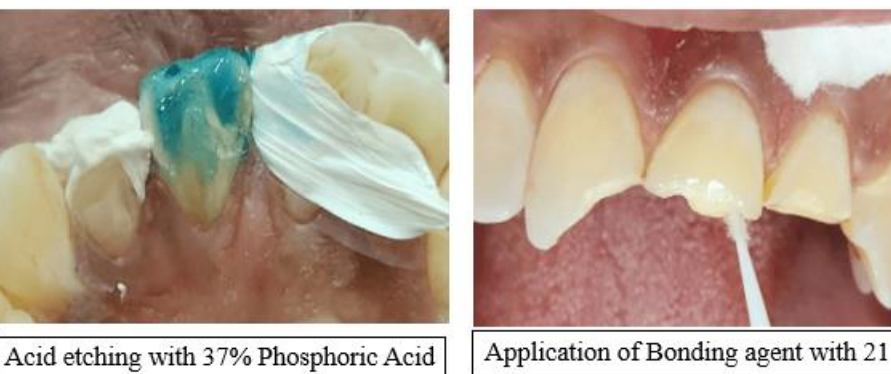


Figure 1, 2 and 3: shows pre - operative clinical photograph

3. Treatment Plan

Oral prophylaxis was done then preoperative photographs were taken. The area to be restored was dried; then 45 degree bevel was placed labially to remove the unsupported enamel and increase the surface area using round ended tapered

carbide bur. This was followed by placement of grooves palatally with 21 using No.245 straight fissure carbide bur. The grooves were placed mesially as well as distally as there was no enough natural tooth structure present on both line angles of tooth (21). The groove was placed parallel to long axis of tooth so as to resist the forces. Dimensions of grooves were – (2×1×0.8) mm (i. e. Length× breadth× depth).





Application of composite resin with 21



Light curing procedure with 21



Composite build up with 11,21,22 – Labial view



Composite build up with 11,21,22 – Palatal view



Finishing with composite



Final polishing with rubber disk



Pre operative photograph



Post operative photograph

4. Discussion

Crown fractures in anterior teeth are common form of dental injury that majority of times affects children and adolescents. Uncomplicated crown fracture to the permanent teeth has an intense effect on the patient's appearance, function and speech. Management of patient's with anterior compromised tooth fracture is a great challenge to the clinicians⁷. Fibre reinforced composite restoration is more advanced, better and excellent choice to treat uncomplicated fractures of anterior teeth. This material is non - corrosive,

have good bonding ability, prevents crack propagation in restored teeth, easy to use and can be performed in single visit. Due to its advantages like strength, support, longevity, aesthetic etc it can be used as a material of choice for restoration of fractured anterior teeth⁸.

Interlig is a structure of intertwined glass fibers impregnated with light - cured composite resin which is composed of - Glass fibers (weight) - $60 \pm 5\%$. - Impregnated resin (weight) $40 \pm 5\%$: Bis - GMA, diurethane, barium glass, silicon dioxide and catalysts. Fibre reinforced composite can also be

used in case of splinting, reinforcement and repair of acrylic resin bridges, fabrication of space retainers in pediatrics.

In present case, considering age, esthetic requirement and longevity of restoration, fibre reinforcement was planned which increases the strength and the life span of restoration.

5. Conclusion

Restoring fractured teth is a complex procedure and in utmost cases strength is a compromising factor. Restoration with interlig fibres provides greater strength, excellent esthetics and also increases the life of the restoration. So in cases of fractured teeth with less remaining tooth structure, Interlig fibres can be a choice for reinforcing composite restorations.

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