# A FIBER REINFORCED COMPOSITE RESIN BRIDGE- A VIABLE OPTION FOR MISSING ANTERIOR TOOTH-A CASE REPORT

Monika Pandey[1], Jasheena Singh[2], Nidhi Gupta[3], Rahul Tiwari[4]
*Post graduate student[1,4], Professor and Head[2], Professor[3]*
*1-3 Department of Pedodontics, Maharanapratap college of dentisty and research centre Gwalior, 4Department of Orthodontics, Maharanapratap college of dentisty and research centre Gwalior*

**Abstract**
Esthetic is the major concern for the patients in their social life and missing anterior tooth can affect that very much. Varieties of invasive ad non-invasive treatment modalities, from implants to bridges, can be used for replacement of traumatically missing anterior tooth. Fiber Reinforced Composite Resin Bridge (FRC Bridge) can be a viable and minimal invasive alternative for missing anterior tooth. The purpose of this article is to present a clinical case of traumatically missing anterior tooth replacement by FRC Bridge.
**Keywords**: Fiber Reinforced Composite Resin Bridge, Trauma, Central Incisor

## INTRODUCTION

Traumatic damage to anterior teeth is a common form of injury, particularly in children and adolescents. Patients presenting with traumatized or lost anterior teeth require immediate attention for restoration of esthetics and function[1]. Different therapeutic options can be considered for the replacement of missing teeth from implants to dentures and bridges, but these can be very invasive procedures for children and adolescents. Also the age factor plays a role when it comes to prosthesis; hence for such cases fiber reinforced composite resin bridge can be more conservative alternative for the replacement of missing anterior teeth[2].

FRC Bridge also can be an alternative to conventional bridges. FRC Bridge can be fabricated intraorally as well as extraorally, can also be used in the cases where there is a need for one-visit replacement of a single anterior tooth[3, 4, 5]. This article describes a clinical case in which a FRC bridge is fabricated extraorally for the replacement of traumatically missing permanent central incisor.

## CASE REPORT

A 12 year old male child reported in the Department of Pedodontics and Preventive Dentistry, Maharana Pratap College of Dentistry and Research Center, Gwalior, complaining of trauma in upper front tooth region which took place 2 days back. Intraoral examination revealed good oral hygiene, Ellis class II fracture and Grade II mobility in relation to maxillary right central incisor (Figure1). Radiographic examination revealed Ellis class VI fracture involving
crown of maxillary right central incisor (figure 2). Surgical extraction followed by FRC Bridge using artificial resin pontic was planned as treatment modality as fixed prosthesis was not suitable due to age factor[1]. In the same appointment, the surgical extraction was done and patient was medicated with Ibugesic plus and Amoxicillin twice a day for 3 days.


Figure 1: Preoperative photograph


Figure 2: Radiograph


Figure 3: After extraction healing

After the complete healing of the socket (Figure 3), oral prophylaxis was done and alginate impression of upper and lower arch was recorded and dental stone model was poured. Wax-up pattern for missing central incisor was made on model cast (Figure 4A) and template was made using silicone impression material (Figure 4.B). Template was used to fabricate the artificial resin pontic with flowable composite

(IvoclarTetric N Flow Bulk fill Composite), shade A1 was selected under natural light (Figure 4C).

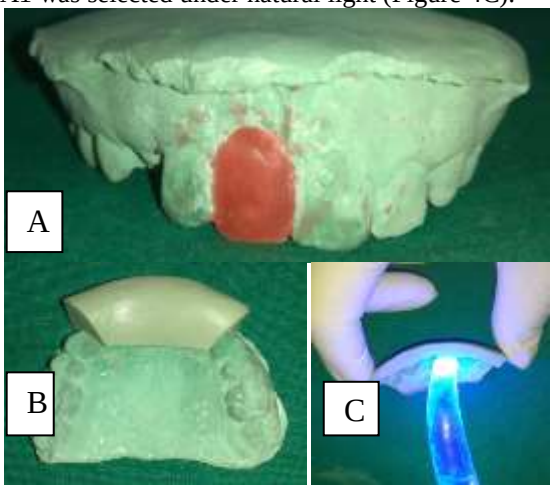


Figure 4: A: Wax-up B: Template
C: fabrication of artificial pontic

Commercially available Braided Glass Fiber Impregnated with light cure (Interlig, Angelus) was used for FRC bridge. The length of the FRC Bridge was measure using soft foil and extended till middle third of the abutment teeth lingually and crossed pontic area directly under incisal edge[2]. Following the measurement of foil, Interlig fiber was cut and wetted with bonding agent (IvoclarTetric N Bond Universal) and kept aside till used away from light.

A thin layer of restorative composite was placed on lingual surface of abutment teeth on model which acted as glue and held the Interlig fiber on place during adaptation. The necessary adjustment were made and light cured for 40 seconds. Flowable composite (Ivoclar Tetric N Flow) was layered over the abutment teeth. A notch was made on lingual surface of artificial resin pontic and a small amount of restorative composite was applied on the surface of fiber contacting pontic. The artificial resin pontic was positioned on fiber in proper alignment, occlusion was checked and light cured for 40 seconds. Then the FRC Bridge was easily removed from stone model and finished (Figure 5 A, B).

The bridge was inserted in to the patient's mouth to check the fit. Then the internal surface of the wings was etched with 37% phosphoric acid (Ivoclar N Etch) for 15 seconds, rinsed and air dried. A layer of bonding agent was applied and thoroughly air dried and light cured for 20 seconds (Figure 6).

After the proper isolation the lingual surface of the abutment teeth were etched and rinsed. The surface was air dried and bonding agent was layered and light cured for 20 seconds. A thin layer of dual core composite (Ivoclar Tetric N Ceram) placed on internal surface of the wings of the bridge and firmly positioned on the abutment teeth, excess cement was removed and final light curing was done for 40 seconds. Occlusion was checked using articulating paper and necessary adjustment made and final finishing and polishing was done (Figure 7.A, B).

Patient was followed up in 1 week, 3 months and 6 months.


Figure 5 A, B: FRC Bridge on Stone Model

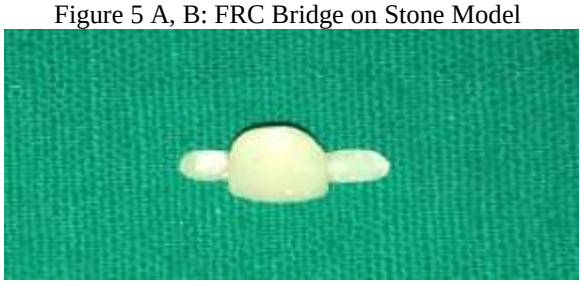

Figure 6: FRC Bridge

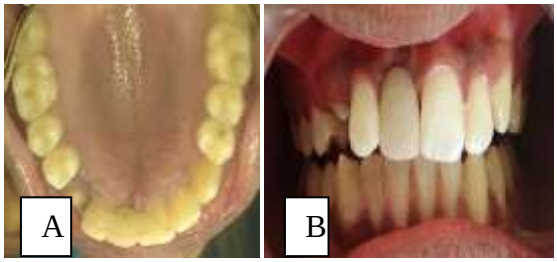


Figure 7 A, B: Post Operative Photographs

**DISCUSSION**

Composites that are reinforced with polyethylene fibers can result in materials with enhanced mechanical properties[6,7]. Fibers produce a load-enhancing effect on the brittle composite materials by acting as the stress-bearing component and by crack-stopping or crack-deflecting mechanisms.[7]

Fixed FRC bridges offer a suitable alternative to replace a missing permanent anterior tooth, especially in a growing child until a fixed prosthesis can be provided at the end of growth period. Advantages of this design include bondability, chair-side ease of fabrication and repairability[2]. In the case of surface-retained FRC prostheses, the framework can be supported from both ends because of better bonding characteristics and biomechanical flexibility of the FRC framework[8]. Although resin-bonded FRC FPDs are most commonly used in the anterior and premolar

regions, rather than molar region, recent laboratory investigations have suggested that optimally designed FRC FPD made on non prepared abutments can provide even higher load-bearing capacity for the FPD than conventional porcelain-fused to metal FPD can provide[9]. Studies by Unlu and Bellis and Freilich have reported a mean survival period of 3 and 4.5 years respectively[10,11].

Interlig (angelus, dental) is a braided glass fiber impregnated with light cured composite resin. It is biocompatible, esthetic, translucent and practically colorless and disappears within the composite without show through. It is manufactured by the process called Resination where the fibers are pulled along a convoluted path through the resin bath. Pressures at roller force resin into the fabric or fiber bundles[12.]

Many times there is the need for one-visit replacement of a single anterior tooth. For these cases a fiber-reinforced fixed partial denture using a natural tooth pontic, composite resin pontic, or acrylic denture tooth as a pontic can be fabricated. Although this technique was used for an interim-method of anterior tooth replacement, its conservative preparation and reported success suggest that it may be considered as a definitive alternative in certain situations[13].

## CONCLUSION

The case presented in this article suggests an interim treatment option for the replacement of missing anterior tooth in young children**.** The minimal invasive approach with fiber reinforced composite have shown satisfactorily results esthetically. Although the long term follow-up is required for the longevity of the prosthesis.

## REFERENCES


1.Kiran kumar SV, Sinha S, Kariya P. Conservative Bridge Preparation: With Ribbond Fiber. Journalofdentofacialsciences2015; 4(1): 17-20.

2.Chafaie A, Portier R. Anterior fiber reinforced composite Resin Bridge: a case report. Pediatr Dent 2004;26(6): 530-34

3.Kalia G, Tandon S, Bhupali NR, Rathore A, Mathur R, Rathore K. Speech evaluation in children with missing anterior teeth and after prosthetic rehabilitation with fixed functional space maintainer. J Indian SocPedodPrev Dent 2018; 36:391-5.

4.Gupta A, Yelluri RK, Munshi AK. Fiber-reinforced Composite Resin Bridge: A Treatment Option in Children. Int JClinPediatr Dent 2015;8(1):62-5.

5.Shah D. Minimally Invasive Fiber-Reinforced Composite (Frc) Bridge for the Missing Tooth: A Case Report. Journal of Dental and Medical Sciences 2018;17(3):71-4.

6.Rudo DN, Karbhari VM. Physical behaviors of fiber- reinforcement as applied to tooth stabilization. Dent Clin North Am 1999;43(1):7-35.

7.Issac DH. Engineering aspects of the structure and properties of polymer-fiber composites: proceedings of the first symposium on fiber-reinforced plastics in dentistry. J Dent 2000;1989(2729):1-2.

8.VallittuPK and Sevelius C. Resin-bonded, glass fiber-reinforced composite fixed partial dentures: a clinical study. Journal of Prosthetic Dentistry 2000;84( 4):413-18.

9.Dyer SR, Lassila LVJ, Alander P, Vallittu PK. Static strength of molar region direct technique glass fibre-reinforced composite fixed partial dentures. Journal of Oral Rehabilitation 2005;32(5):351-7.

10.Unlu N, Belli S. Three-year clinical evaluation of fiber-rein- forced composite fixed partial dentures using prefabricated pontics. J Adhes Dent 2006;8(8):183-8.

11.Freilich MA, Meiers JC, Duncan JP, Eckorte KA, Goldberg AJ. Clinical evaluation of fiber-reinforced fixed bridges. J Am Dent Assoc 2001;133(11):1523-4.

12.Jain MM, Chandra RV, Geeta IV, Idris M. One for All That Last Long- Fiber-ReinforcedComposite Illustrations with Case Report. I J Pre Clin Dent Res 2014; 1(2):54-9.

13.Turker SB, Sener ID. Replacement of a maxillary central incisor using a polyethylene fiber-reinforcedcomposite resin fixed partial denture: A clinical report. Turkey J Prosthet Dent 2008; 100:254-8.



**Corresponding Author:**
Dr. Monika Pandey
Post Graduate Student,
Dept. of Pedodontics,
MaharanaPratapCollege of Dentistry &Research Centre, Gwalior
Emailid-drmonikapandey2251@gmail.com
Mobile +919407018052



**How to cite this article:** Pandey M, Singh J, Gupta N, Tiwari R. A Fiber Reinforced Composite Resin Bridge- A Viable Option for Missing Anterior Tooth-A Case Report. TMU J DENT 2018;5(3):25-27