

Conservative and Esthetic Approach Using Glass Fiber Reinforced Composite for Replacement of Missing Anterior Tooth: A Clinical Case Report

Amit Chavan¹, Alok Patel², Geetanjali Jadhav³, Krishna Patil⁴

1,3,4- Postgraduate Student, Bharati Vidyapeeth Deemed University, Dental College And Hospital, Pune. 2- Professor And Head of The Department, Department of Pediatric Dentistry and Preventive Health, Bharati Vidyapeeth Deemed University, Dental College And Hospital, Pune.

Correspondence to:
Dr. Amit Chavan, Postgraduate Student, Bharati Vidyapeeth Deemed University, Dental College And Hospital, Pune.
Contact Us: www.ijohmr.com

ABSTRACT

Absence of the anterior teeth is a still a major stigma in most of the societies various age old modalities like that of FPD's and the recent implants offer a time tested and a stable restoration. The recent advance of fibers in dentistry on to use as a conservative, fast and an economical alternative to single and multiple teeth replacement.

KEYWORDS: Glass Fiber Reinforced Composite, Anterior Teeth

INTRODUCTION

Loss of the anterior teeth is most common form of injury in children and adolescence. Patients with anterior tooth loss require immediate attention for aesthetic and functional purpose. Esthetic and functional rehabilitation is one of the major challenges faced by dentist.

Fiber reinforced composite (FRC) materials consist of glass, carbon or polyethylene fibers contained within a resin matrix. The type of fiber architecture and the quality of fiber/matrix coupling determine the mechanical properties of the materials.¹

The dental profession is being offered the possibility of fabricating resin bonded esthetically good metal free restoration for single and multiple teeth replacement by fiber reinforced composite(FRC).

Sufficient horizontal minimum vertical overlap must be present between the teeth to minimize stress and reduce the chance of debonding. If primary abutments are weak secondary abutment should be used.

Polyethylene fibers with custom made composite resin, PFM or all ceramic pontic are being successfully used for fabrication of FPD. High polyethylene fibers can be used to increase the strength of provisional acrylic or composite resin crown and FPD, orthodontic retainers, periodontal splints, dentures and occlusal guards and for repair and reinforcement procedures.²

CASE REPORT

A 14 year old male patient reported to the Department of Pedodontics and Preventive Dentistry at Bharati Vidyapeeth Deemed University Dental College and

Hospital, Pune with chief complaint of missing maxillary right central incisors due to trauma 1 year back. The intraoral examination showed missing 11 tooth and healthy dentition (Figure No. 1). There is no evidence of bruxism or wear facet on the occlusal surfaces and showed maximum intercuspation. On radiographic examination revealed missing 11.



Figure no.1: Intraoral examination showing missing 11

Based on the findings various treatments available are:

- Implant supported crown
- Conventional fixed partial denture.
- Removable partial denture
- Resin bonded fixed partial denture.

The implant supported crowns werenot selected as they needed a lot of time of time required and surgical intervention whereas fixed partial denture required cutting of healthy tooth structure.

Clinical Procedure: After oral prophylaxis alginate impression was made of maxillary arch. After which the

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impression was poured in dental stone, and cast was retrieved. The length of reinforced fiber (Interlig) was accurately determined by placing the dental floss on palatal surfaces from distal end of right lateral incisors to left central incisor. After the teeth were rinsed thoroughly with water and dried, palatal surface of teeth being splinted were etched with 37% phosphoric acid for 30 sec. The preparation were rinsed with water and dried.

A bonding agent (kerroptibond) applied on palatal surface of abutment teeth and fiber mesh. The excess amount of bonding agent was then removed and thin flow able composite (dentsply) was applied to palatal surfaces of abutment teeth just above the cingulum. Composite was again applied on the ends of the fiber (figure no.2) and was cured with light gun for 30 sec.



Figure no.2: Bonding of fiber

Acrylic tooth matching the closest shade was then selected according to space available (figure no.3 and 4). Horizontal groove was made to adapt the tooth on the fiber. Additional composite was placed on the tooth and light cured. Incisal adjustment and final finishing and polishing were done. Routine oral hygiene instruction was given. Patient was then evaluated after 6 months and restoration was found to be intact (figure no. 5).



Figure no.3: Post restorative



Figure no.4: Intraoral View



Figure no.5: Follow up after 6 months

DISCUSSION

A replacement of missing teeth with FRC with an acrylic tooth is a simple single visit chairside procedure this report describes the replacement of the right maxillary central incisors with more conservative and esthetic method.

Direct technique is conservative, cost effective, eliminates laboratory procedure. The prosthesis can be placed in a single visit using natural teeth, acrylic tooth or composite resin teeth as a pontic³. Lab made surface retained resin bonded prosthesis are supported from one end while FRC frame work can be supported by both the ends because of better bonding characteristic and biomechanical properties.

Although resin bonded FRC and FPD's are mostly commonly used in the anterior region, recent laboratory investigations have suggested that optimally designed FRC FPD made on unprepared abutment can provide even higher load bearing capacity for the FPD than conventional porcelain-fused to metal FPD can provide⁴.

The retention is influenced by placement of fiber into the groove and careful bonding procedure. In vitro studies have shown that FRC material exhibit increased strength when compared to particulate resin and can withstand occlusal forces in load bearing situations. Vallittu and Sevelius⁵ studied clinical success of FRC and found 93% survival rate after 24 months followup.

With advancement in composite resin, the new generation composite resins have very good wear and stain resistance. The new generation Nano ceramic composite resins are available in different enamel and dentin shades, so shade matching and characterization of the pontic are easy and esthetic results obtained are really good. This prosthesis can be successfully used as short term alternatives for replacement of missing anterior teeth in young patients when conventional FPDs are contraindicated. Further studies are needed to evaluate the long term use of FRC.

CONCLUSION

To conclude combination of filling composite, acrylic adhesive system and FRC has introduced new generation of metal free teeth replacement that is both esthetic and conservative. The most recent fabrication principles needed to be followed to ensure a long lasting restoration.

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