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CASE STUDY

ANTERIOR FIBER REINFORCED COMPOSITE-FIXED PARTIAL DENTURE – A CASE REPORT

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ABSTRACT

Missing anterior teeth is common in children and adolescents. This will impair esthetics and function. The choice for replacement is in wide range from removable prosthesis to fixed prosthesis with more preference for fixed prosthesis. Fixed prosthesis include fixed partial dentures and implants. They are time consuming and require multiple visits. Fiber reinforced composite-fixed partial denture is a good alternative for immediate replacement of missing teeth. This case report is on replacement of missing anterior teeth using fiber reinforced composite-fixed partial denture.

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INTRODUCTION

In children and adolescents, missing anterior teeth is commonly due to injury whereas in adults the same occur due to advanced caries or periodontal diseases that need to be extracted. Missing anterior teeth demand first and foremost attention in any age group for esthetic and functional reasons (Garoushi *et al*., 2011). The choice of replacement of missing anterior teeth ranges from traditional removable prosthesis to advanced dental implants. Various treatment modalities have their own merits and demerits (Hemmings Ken and Harrington Zoe, 2004). With the advancements in dental materials especially with adhesives and composites, led to the development of fiber reinforced composite-fixed partial denture. This provided the dental profession with option of esthetically good and metal-free replacement for missing anterior teeth (Garoushi, *et al*., 2011). The fiber reinforced composite materials consist of resin matrix reinforced with glass, carbon or polyethylene fibers.

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The mechanical properties are determined by the fiber type, fiber architecture and the quality of the fiber/matrix coupling. In vitro studies proved that the flexure strength of fiber reinforced composite materials are greater than or comparable to metal alloys but have low flexure modulus. With help of researches, the mechanical performance was shown to be improved by effective penetration and wetting of the fiber bundles by the resin (Freilich Martin *et al*., 2002). Even today, these fiber reinforced composite-fixed partial dentures are not routinedly used as a permanent treatment option in replacement of missing anterior teeth. This case report presents a technique to replace missing single anterior tooth using fiber reinforced composite-fixed partial denture without preparation of the abutment teeth.

Case summary

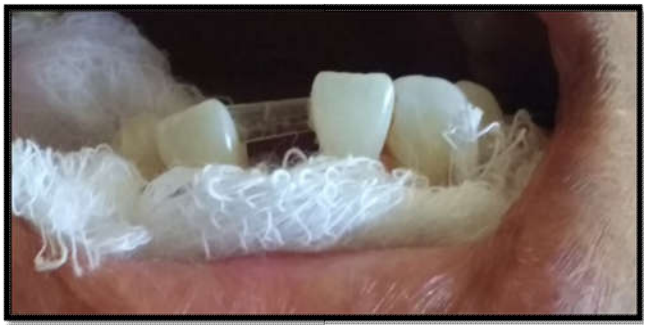
A 46 years old female patient reported to our department with chief complaint of missing lower front teeth. Past dental history revealed that she had undergone extraction of lower front teeth before 7 months due to periodontal problem. No relevant medical history was present.

Good oral hygiene with missing right mandibular anterior 41 was found intraorally. Intraoral periapical radiograph was taken in relation to 31 and 42. 31 revealed bone loss and periodontal status was fair to use 31 as a abutment tooth in fixed partial denture. Taking into consideration of clinal presentation and radiographic findings, patient was given with various options like removable partial denture and implant for the replacement of missing teeth. But the patient demanded metal free fixed restoration as early as possible at a moderate price. So, patient was explained about fiber reinforced composite-fixed partial denture and she agreed for the same. Everstick C and B fiber was used. Pre-operatively, the required length of fiber was measured intraorally then cut and kept. Acrylic resin tooth for 41 with shade and shape matching with the adjacent teeth was kept ready. The abutments 31 and 42 were acid etched. Proper isolation was done in relation to 31, 41 and 42. Adhesive resin was applied and cured. The fiber was placed on the lingual side and bridged between 31 and 42. Over the fiber composite was placed and cured. The selected acrylic tooth was modified lingually and acid etched on the lingual side. Adhesive resin was applied on the lingual side and cured. Composite was placed on the lingual side of the tooth and positioned on the fiber then cured. The final adjusments and polishing was done on the composite. Patient was happy with the esthetics of the fiber reinforced composite-fixed partial denture. The fiber and tooth positioned using composite after etching the abutment teeth and applying bonding agent.

Pre operative intraoral views

Extraoral view of the fiber and selected tooth

Pre-operative extraoral view



Placement of fiber intraorally

Post operative intaoral and extraoral view

DISCUSSION

Noninvasive or minimally invasive approaches for replacement of missing teeth especially esthetically demanding anterior teeth is advancing with the advancements in the materials and techniques of adhesive dentistry. Pre-impregnated fiber reinforced composite provides chairside immediate fabrication of fixed partial denture minimal or nil preparation of the abutment teeth (Meiers, 2007). This chairside-produced all resin fiber reinforced fixed partial dentures have come through long way since described by Knight and Belvedere using traditional acid etching procedure (Belvedere, 1998). Various fiber materials used in reinforcement are ultrahigh molecular weight polyethylene fibers like Ribbon, aramid fibers or galss (Meiers, 2007). Kumbuloglu *et al*. (2008) commented that glass fiber fixed partial dentures are superior esthetically, economical, ease of repair and demand minimal tooth preparation. Chafaie and Portier (2003) found that fiber reinforced composite-fixed partial dentures were more comfortable than a removable appliance, nonirritating, and hygienic. Husein and Berekally (2005) stated that fiber reinforced composite-fixed partial dentures are better option in young patients where implant therapy is contraindicated. Also this is comfortable and feasible option for elderly and disable patients and patients with metal allergy. Nidhi Gupta and Kunwarjeet Singh[9] showed that fiber reinforced composite bridges can be used interim treatment option for the replacement of missing anterior tooth in young children. The advantages of fiber reinforced composite-fixed partial dentures are preservation of abutment teeth from preparation and economically feasible option (Ahlstrand Wisua and Finger Werner, 2002). Meiers and Kazemi (2005) through their study found that use of an external approach to place the wings of the framework will be more conservative by eliminating tooth removal. But it will cause the failure of the prosthesis. Kermanshah and Motevasselian (Kermanshah *et al*., 2010) published a case report where they used fiber reinforced composite-fixed partial denture with natural tooth as a pontic and found esthetically promising results. Unlu and Belli (2006) suggested that prefabricated pontics provide practical and estheticallyimmediate tooth replacement that require minimum materials and time for fabrication. The fiber reinforced resins are also indicated in periodontal splinting, management of occlusal trauma and immobilization of teeth experiencing progressive migration and pain during function (Ahlstrand Wisua and Finger Werner, 2002). In the present case report, patient was followed up for one year. Patient is satsfied with the esthetics and the function of the prosthesis. The advantages of the present technique are direct chair side technique, prefabricated resin tooth as a pontic, less time consuming, economical, metal free prosthesis and useful even in medically compromised individuals, elderly patients and young children.

Conclusion and learning points

- Fiber reinforced composite-fixed partial dentures are good restorative option for immediate metal free replacement of missing teeth.
- Economically fixed treatment option for patients who does not fit or ready for more invasive procedures.
- Long term studies required to assess the longevity of this kind of fiber reinforced composite-fixed partial dentures.

REFERENCES

Ahlstrand Wisua, M. and Finger Werner, J. 2002. Direct and indirect fiber-reinforced fixed partial dentures: Case reports. *Quintessence international,* 33:359-65.

Belvedere, P. 1998. Single sitting, fiber-reinforced fixed bridges for the missing lateral or central incisors in adolescent patients. *Dent Clin North Am.,* 42:665-682.

Chafaie Amir & Portier Richard. Anterior fiber-reinforced composite resin bridge: A case report. *Pediatric dentistry*, 2003; 26:530-534.

Freilich Martin A. *et al*., 2002. The design and fabrication of fiber-reinforced implant prostheses. *Journal of Prosthetic Dentistry*, 88 (4):449 – 454.

Garoushi, S., Lassila, L. and Vallittu, PK. 2011. Resin-bonded fiber-reinforced composite for direct replacement of missing anterior teeth: a clinical report. *Int J Dent*., 2011:845420.

Gupta, N. and Singh, K. 2012. Putty Index: An Important Aid for the Direct Fabrication of Fiber Reinforced Composite Resin FPD. *J Indian Prosthodont Soc.,* 14(Suppl 1):187-189.

Hemmings Ken and Harrington Zoe, 2004. Replacement of Missing Teeth with Fixed Prostheses. Dental update. 31:137-41.

Husein, A**.** and Berekally, T. 2005. Indirect resin-bonded fibre-reinforced composite anterior bridge: a case report. *Aust Dent J.***,** *50* (2):114-118.

Kermanshah, Hamid and Motevasselian, Fariba, 2010. Immediate Tooth Replacement Using Fiber-reinforced

Composite and Natural Tooth Pontic. *Operative dentistry*, 35:238-45.

Kumbuloglu Ovul, Aksoy Gokhan and User Atilla, 2008. Rehabilitation of advanced periodontal problems by using a combination of a glass fiber-reinforced composite resin bridge and splint. *The journal of adhesive dentistry*, 10:67-70.

Meiers JC. Chairside Fabricated Fiber-reinforced Fixed Partial Denture. Libyan J Med. 2007;2(1):14.

Meiers, J.C. and Kazemi, R.B. 2005. Chairside Replacement of Posterior Teeth Using a Pre-fabricated Fiber-reinforced Resin Composite Framework Technique: A Case Report. *J Esthet Restor Dent*., 17(6):35–342.

Unlu, N. and Belli, S. 2006. Three-year clinical evaluation of fiber-rein-forced composite fixed partial dentures using prefabricated pontics. *J Adhes Dent*., 8(8):183–188.

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