

**PROVISIONAL ANTERIOR TOOTH REPLACEMENT USING FIBER  
REINFORCED ARTIFICIAL TOOTH: 3 CLINICAL REPORTS\***

**ANTERİOR DİŞ EKSİKLİKLERİNDE GEÇİCİ OLARAK FİBERLE  
GÜÇLENDİRİLMİŞ YAPAY DİŞ UYGULAMALARI: 3 OLGU SUNUMU\***

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**ABSTRACT**

The loss of anterior teeth can be distressing for patients, both socially and psychologically. Conservative solutions for the restoration of a single edentulous space in the anterior maxilla and mandibula present an esthetic challenge to the clinician. In recent years, reinforcing resin-based fixed partial denture (FPD) frameworks have achieved increasing acceptance in prosthodontics as applicable alternatives to metal-based restorations. Chairside tooth replacement is an application of fiber reinforced restorations. Immediate chairside replacement of an anterior tooth may present to the patient's esthetic, comfort, treatment acceptance, expectancies of treatment and use when the patient needs a short-term solution. Several approaches have been described for the immediate replacement. This clinical report presents 3 cases where fiber reinforced artificial tooth was successfully used to provisionally restore anterior edentulous area in terms of esthetic-cosmetic values and functionality.

**Key words:** Provisional prosthesis, fiber reinforced artificial tooth.

**ÖZET**

Anterior dişlerin kaybı hastalar için hem sosyal hem de psikolojik açıdan üzüntü verici bir durumdur. Anterior maksilla ve mandibuladaki tek diş eksikliklerinin konservatif bir şekilde tedavisi klinisyen için estetik açıdan zordur. Son zamanlarda, metal destekli restorasyonlara alternatif olarak rezinle güçlendirilmiş sabit protezler protetik tedavide artarak başarılı kabul edilmektedir. Hasta başında diş eksikliği giderilmesi fiberle güçlendirilmiş restorasyonların bir uygulamasıdır. Kısa bir süre için anterior diş eksikliğinin immediyat olarak giderilmesi, hastanın estetiğini, konforunu, tedaviyi kabulünü, tedavi ve kullanım beklentilerini karşılayabilir. İmmediyat tedavi için birçok yaklaşım tartışılmıştır. Bu olgu sunumunda, estetik, kozmetik ve fonksiyon açısından anterior diş eksikliğinin geçici olarak fiberle güçlendirilmiş yapay diş ile başarılı bir şekilde tedavi edildiği 3 vaka takdim edilmektedir.

**Anahtar kelimeler:** Geçici protez, fiber ile güçlendirilmiş yapay diş

**INTRODUCTION**

Interim restorations are widely used in prosthetic dentistry and designed to enhance esthetics, stabilization and/or function for a limited period of time, after which it is to be replaced by a definitive dental prosthesis. Often such prosthesis are used to assist in determination of the therapeutic effectiveness of a specific treatment plan or the form

and function of the planned for definitive prosthesis.<sup>1</sup> Several materials and procedures are used to make satisfactory interim restorations. There are primary 2 methods of interim restoration fabrication: directly on prepared teeth,<sup>2</sup> indirectly by making an impression of the prepared teeth,<sup>3</sup> or a combination of both.<sup>4</sup>

Fiber systems are used in complete dentures, removable partial dentures, fixed partial dentures, endodontic posts, periodontal splints, and orthodontic

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treatment as a retention splint.<sup>5-8</sup> Reinforcing resin-based fixed partial denture (FPD) frameworks such as fiber system can be a good choice for provisional anterior tooth replacement.<sup>9</sup> FPD saddles have prepared directly or indirectly using extracted tooth, composite resin, and artificial tooth.<sup>10</sup>

The present clinical report describes the treatment of 3 patients using fiber reinforced artificial tooth in the fabrication of provisional fixed partial dentures (FPDs).

### CLINICAL REPORT

#### Patient 1

A 47 year-old man was referred for provisionally treatment of a mandibular right lateral incisor to the Department of Prosthodontics, Faculty of Dentistry at Atatürk University, Turkey. Before the treatment, dental, medical, and social histories were obtained from the patient. In clinical examination, anterior open occlusal relationship was observed and the mandibular right central incisor and canine could be used as abutments for FPDs (Figure 1). In radiographic examination, no pathologic conditions were detected. FPDs was indicated with the consent of the patient.

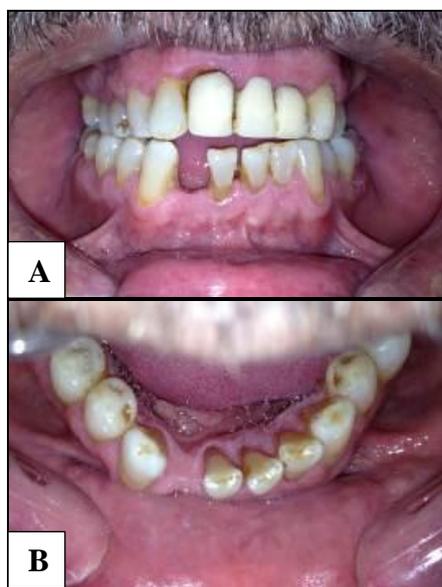


Figure 1. Intra-oral view of the patient before treatment. A, Frontal view. B, Occlusal view.

An artificial tooth (Major Dent; Major Prodotti Dentari SpA, Moncalieri, Italy) was selected according to patient anterior edentulous area in color and

anatomical form and shape and adapted to the edentulous space. A groove was prepared mid palatal section of the tooth because of the need for mechanical support (Figure 2A). This groove was a horizontal channel to accommodate the width and thickness of fiber reinforcement material in the middle third of the tooth. The dimensions of this groove usually ranged from 2 to 3 mm wide and 1 to 2 mm deep. The length of pre-impregnated glass fiber (everStick; StickTech Ltd., Turku, Finland) was measured using dental floss from the distal surface of one abutment tooth to the distal of the other. The required amount of fiber was cut and placed into the groove with autopolymerizing resin (Vertex; Dentimex, Zeist, Holland). After polymerization, residual resin was removed with a tungsten carbide bur at low speed (Figure 2B). During this process, the fiber was protected from early polymerization by artificial and natural light.

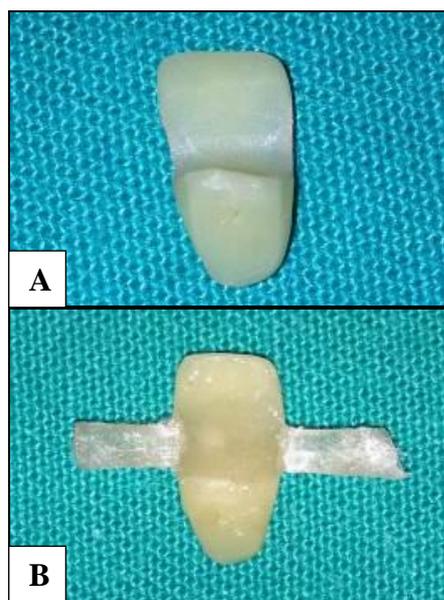


Figure 2. Artificial tooth. A, Groove prepared at palatal surface. B, Glass fiber framework adherend to the tooth

The interim restoration was checked intra-orally for fit. Cotton rolls were used to isolate the working area. The palatal and proximal surfaces of the mandibular right central incisor and canine were etched with 37% phosphoric acid (DeTrey Conditioner 36; Dentsply DeTrey GmbH, Konstanz, Germany) for 30 seconds. The teeth surfaces were washed with water under pressure for 25 seconds using an

air/water spray, and each surface was dried for 20 seconds using an air spray. The bonding agent (Single Bond; 3M ESPE, St. Paul, USA) was applied and polymerized manufacturer instructions using a light polymerizing unit (HS LED 1500; Henry Schein Inc., Melville, USA). A thin layer of flowable composite resin (Grandio Flow; Voco, Cuxhaven, Germany) was applied to the palatal and proximal surfaces of the adjacent teeth. The fiber was pressed into the resin using a hand instrument and placed on the lingual surfaces of adjacent teeth. The fiber was light polymerized for 40 seconds from lingual and proximal directions and covered by another layer of the flowable composite resin.

The occlusion was evaluated and the interim restoration was polished (Sof-Lex Pop-on disks, 3M ESPE) (Figure 3). The patient was asked to return after 2 weeks. No signs of de-bonding, discoloration, or wear was observed, and the patient expressed satisfaction with the FPDs.

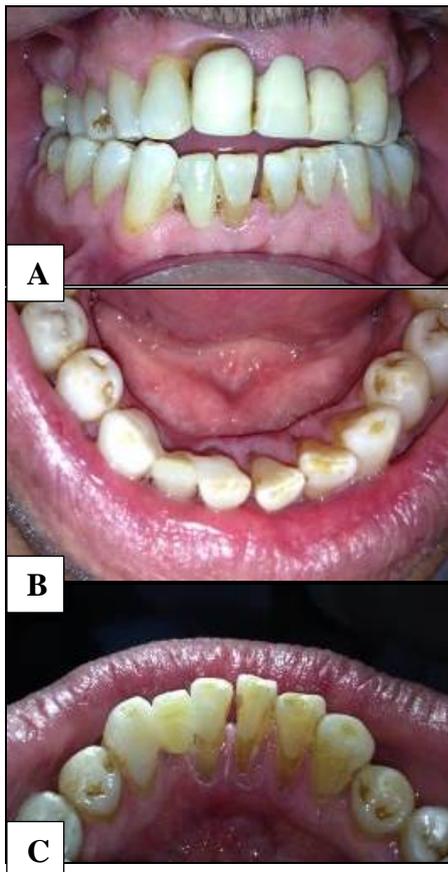


Figure 3. Interim FPDs. A, Frontal view. B, Occlusal view. C, Lingual view

## Patient 2

A 45 year-old woman was referred for implant replacement of a maxillary left central incisor. The tooth was to be extracted to the advanced bone loss of periodontal disease (Figure 4). The patient demanded an interim restoration until she was treated with an implant supported crown. Before the treatment, dental, medical, and social histories were obtained from the patient. Clinical examination revealed a healthy dentition with discoloration of teeth and minimal bone loss of periodontal disease, but there was no increased mobility in the adjacent teeth. The patient has normal horizontal and vertical overlap and canine protected articulation, except reverse articulation of maxillary left canine tooth. In radiographic examination, no pathologic conditions were detected. FPDs was indicated with the consent of the patient.

An artificial tooth and the adjacent teeth were prepared as Patient 1. The occlusion was evaluated with articulating paper (Cemel; President Dental, Duisburg, Germany), the premature contacts were eliminated, and the interim restoration was polished (Figure 5). The restoration were assessed after 2 weeks. Evaluation of the restoration at this visit indicated that there was no debonding and discoloration.

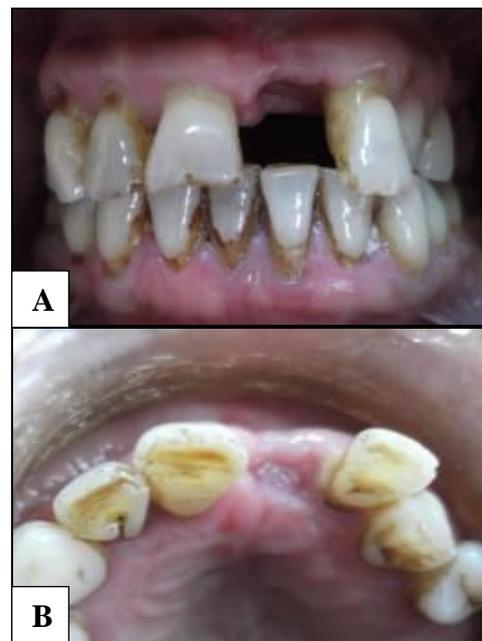


Figure 4. Pretreatment view of edentulous space. A, Frontal view. B, Occlusal view.

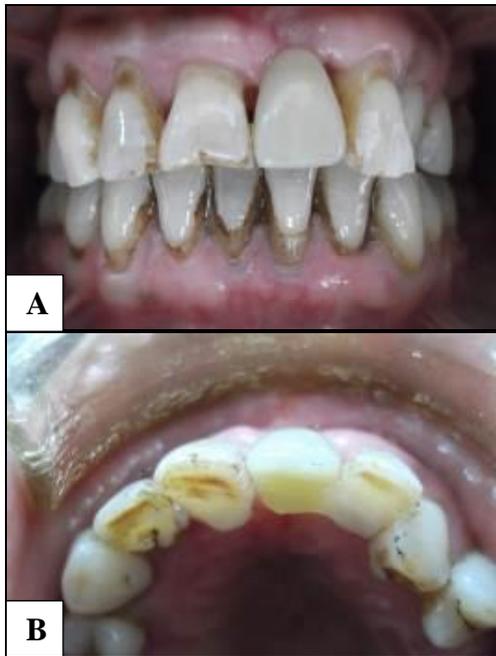


Figure 5. Interim FPDs. A, Frontal view. B, Occlusal view.

### Patient 3

A 31 year-old man was referred to the clinic for treated fixed dental prosthesis of a mandibular left central incisor. In clinical examination, adjacent tooth could be used as abutments for the fixed dental prosthesis, but the soft tissue at the extracted teeth was not quite healed (Figure 6A). In radiographic examination, no pathologic conditions were detected. FPDs was indicated with the consent of the patient during the healing period of the soft tissue. The restoration was accomplished as previously described. Figure 6B shows the clinical condition at the 2 weeks follow-up appointment.



Figure 6. A, Clinical view of the patient before treatment. B, Interim FPDs.

### DISCUSSION

The present clinical report describes a treatment alternative for the provisionally replacement of the anterior edentulous area using FPDs resulting in success over a short-term follow-up. Replacement with FPDs is a noninvasive prosthodontic treatment, or it may be considered a micro-invasive because of the acid etching of the enamel. Traditional methods would require preparation of adjacent teeth as abutments and the use of a substructure. Dental implant is a treatment option to replace a missing tooth. FPDs is used as transitional restoration during bone grafting and soft tissue grafts before implant placement<sup>11</sup> or when implant are placed 2-stage surgical protocol in the anterior segments.<sup>12</sup>

Fiber reinforced composite restorations are achieved in a single visit, but it is a challenge to provide characterization and to obtain a smooth surface at the pontic area.<sup>13</sup> Therefore, an acrylic resin artificial teeth was used, but it is not recommended for use as a pontic except a provisional partial denture because of pure adhesion of composite resin to acrylic resin.<sup>13</sup> Because of this reasons, fiber material was bonded the artificial teeth using an autopolymerizing resin and the adjacent teeth using a flowable composite resin.

The development of adhesive systems has provided different treatment options with minimally invasive preparations and is often simpler.<sup>14</sup> Bonding of the restoration to adjacent teeth and the glass fiber material to artificial tooth are important for the success of the restoration. In addition to preparing grooves on all the related teeth, bonding of the restoration is essential. In the present clinical report,

no enamel preparation was existed, therefore this approach could decrease retention of the restoration. However, disadvantages of this technique are the risk of discoloration and allergic reactions to the residual monomer.

### CONCLUSION

The fiber reinforced artificial tooth can be successfully used provisionally restore esthetics and function to anterior edentulous areas until final restorations complete.

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