J Indian Prosthodont Soc (July-Sept 2011) 11(3):195–198
DOI 10.1007/s13191-011-0092-7

CLINICAL REPORT

Rehabilitation of Anterior Edentulous Space by Glass Fiber Reinforced Composite Removable Partial Denture During Preadolescent Period: A Case Report

Jitendra J. Mete · S. P. Dange · A. N. Khalikar · S. P. Vaidya

Received: 12 April 2010 / Accepted: 2 August 2011 / Published online: 10 August 2011

Abstract The loss of anterior teeth can be hurtful to the patient both psychologically and socially. In adolescent patients, temporary replacement of the teeth can minimize these concerns. Many approaches have been described for this temporary replacement. This article presents an alternative approach for oral rehabilitation of the preadolescent male who has edentulous space including median palatine suture in the anterior maxilla. High expectations regarding esthetics by the patient were successfully met by utilizing a glass fiber reinforced composite temporary removable partial denture. Restoration remained intact, with no discoloration or deterioration at 12 months recall.

Keywords Anterior edentulous space · Fiber reinforced composite · Removable partial denture

Introduction

Prosthetic rehabilitation of edentulous space in anterior maxilla always presents an esthetic challenge to clinician [1]. Implants to conventional fixed partial dentures or even removable partial dentures have been used for the replacement of missing anterior teeth. The glass fiber–reinforced composite material offers an attractive alternative treatment for replacement of missing teeth especially in anterior maxillary region [1–4].

The reinforcement of composite resins by fibers improves both their fracture toughness and resistance [5]. Glass fiber reinforced composite material offers a restorative alternative that produces minimally invasive, esthetic, and cost effective metal free tooth replacement. Saving of time, ease of application, absence of metal allergy, and ease of cleaning are other advantages of this technique. Moreover, use of glass fiber framework can potentially overcome the problem of debonding of composite luting cement to the frame of resin bonded fixed partial denture and esthetic liability of the underlying cast metal frameworks [6].

Growth and development of maxilla continues usually up to the age of 17 years in males [7]. This growth of maxilla in transverse direction limits the fixed restoration in patients with edentulous space crossing median palatine suture.

This clinical report presents the treatment for a young male, who has edentulous space in anterior maxilla, by the replacement of a glass fiber reinforced composite temporary removable partial denture.

Clinical Report

A 14 years old boy was referred to department of Prosthodontics for treatment of an anterior maxillary edentulous space expressing extreme dissatisfaction with his appearance. Two years previously, he had fallen down from a tree, resulting in loss of his central and lateral incisors bilaterally and right canine teeth. Prior to the treatment, detailed dental and medical histories were obtained from the patient. On examination, patient had good periodontal health. No evidence of bruxism or wear facets on the occlusal surfaces of teeth was found. Diastema between left canine and first premolar was observed (Figs. 1a, b, 2). No pathology or root fragments were

J. J. Mete (✉) · S. P. Dange · A. N. Khalikar · S. P. Vaidya
Department of Prosthodontics, Government Dental College and Hospital, Aurangabad, Maharashtra, India
e-mail: jeetendra1685@gmail.com

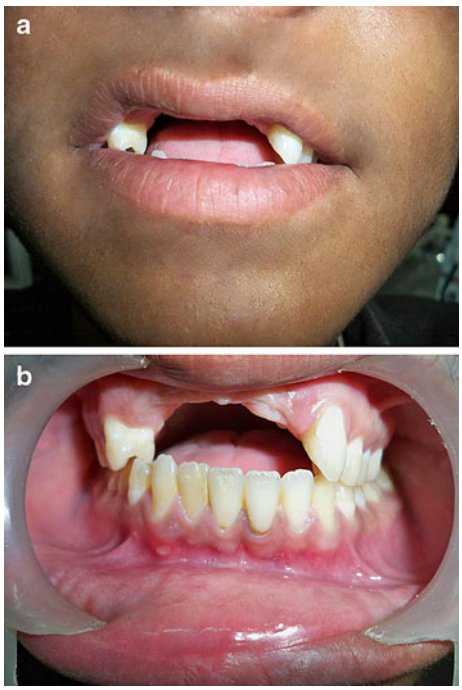

Fig. 1 **a** Pretreatment frontal view. **b** Pretreatment occlusion

Fig. 2 Pretreatment occlusal view of edentulous space

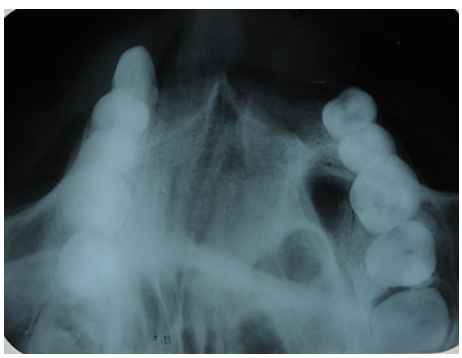

Fig. 3 Occlusal radiograph pretreatment

detected in occlusal radiograph (Fig. 3). To address the patient's primary concerns, a treatment plan was developed that included placement of a glass fiber reinforced composite temporary removable partial denture. Implants are not indicated at this age, as premaxilla continues to grow downward and forward. Also the patient was not interested in conventional removable partial denture. The patient and his parents were informed about the usage of glass fiber reinforced composite temporary removable partial denture and they accepted this treatment plan option. For both arches silicon impressions (Flexitime, Heraeus Kulzer, Germany) were made, an interocclusal registration in maximal intercuspal position was obtained, and shade was selected.

Fig. 4 Glass fiber framework on cast

Laboratory Procedures

Cast models were poured with hard dental stone and mounted on an articulator. Cellophane sheet (Asian Acrylates, Mumbai) was adapted over retainer teeth on the stone cast as separating agent. Woven glass fibers were adapted to the left canine and right first and second premolars, after which they were light, cured for 40 s. After application of bonding agent unidirectional glass fibers (Interlig, Angelus, Londrina, Brasil.) were cut to suitable length and placed on oven glass fibers and light cured for 40 s. Glass fiber framework was adapted and veneered with thin layer of composite restorative material (3M Z100, MN, USA) and light cured for 40 s (Fig. 4). The glass fiber framework was then checked intraorally for fit. Composite (3M Z100, MN, USA) teeth that were affixed to the glass fiber framework were free hand sculptured in place. It was finished using medium grit diamond burs and finally polished.

Clinical Procedure

The completed temporary removable partial denture was checked intraorally. The accuracy of fitting and esthetic was verified. The occlusion was assessed. After the occlusal and proximal contacts had been adjusted, the patient was instructed not to sleep with this temporary

removable partial denture in place. Also the patient was instructed to avoid biting on hard food or objects. Temporary removable partial denture was seated in place and satisfactory esthetic results were obtained (Figs. 5, 6). Patient was monitored at 3 months interval for 12 months. During that time no deterioration in prostheses was observed. The patient's oral hygiene was satisfactory, soft tissues healthy, and the patient expressed complete satisfaction with temporary removable partial denture.

Discussion

This clinical report describes the restoration of anterior midline maxillary edentulous area using a conservative, esthetic glass fiber reinforced composite temporary removable partial denture in a young preadolescent patient. The loss of anterior teeth can be psychologically and socially harmful to the patient. The trauma of which can be minimized by immediate replacement of teeth, preferably using fixed prostheses [8]. However, when considering condylar growth of mandible, sutural growth of maxilla is completed 2 years before. Fixed partial denture in patient who has anterior edentulous area involving midpalatine suture can affect transverse growth of maxilla. Bjork studied the growth of maxilla in three dimensions. He placed metal implants on the palatal aspects of two central incisors and reported that distance between these two implants increased 1 mm from the age of 10–18 [7].

On the other hand, patient's age also precludes dental implants in adolescent period because at this age, the premaxilla continues to grow downward and forward. In adolescent patient a flipper type temporary prostheses or a denture tooth attached to a Hawley retainer can be fabricated for temporary replacement of missing anterior teeth. However, this option is not very hygienic, with tissue inflammation and papillary hyperplasia as probable outcomes [9].

In comparison with conventional removable partial denture, a glass fiber reinforced composite temporary removable partial denture is more esthetic, less costly, and offers the dentist the option of chair side repair. Saving of time, elimination of second visit, ease of application, and naturalness of filling are other advantages of this technique [10]. However, taking out this temporary removable partial denture during eating can cause esthetic disadvantage.

This temporary removable partial denture could not be flexed over deep tooth undercuts. Thus, it was applied in shallow tooth undercuts.

Etched metal fixed partial denture requires some degree of tooth preparation. In this case, the glass fiber reinforced composite temporary removable partial denture did not require tooth preparation, providing the patient with more treatment options in the future. Also it is most difficult to remove Maryland Bridge without damage to the prostheses or abutment tooth [9].

Fig. 5 Post treatment frontal view

Fig. 6 Post treatment occlusal view

Summary

Over recent years, the desire expressed by many patients for esthetic and metal free restorations has lead to development of better performing composite resins. Use of glass fibers as reinforcement for composite resins has provided appropriate mechanical strength for composite resin to be used in replacing missing teeth.

As growth and development of jaws continue in the preadolescent patient who has high expectations regarding esthetics, the glass fiber reinforced composite removable partial denture was selected to treat a maxillary anterior edentulous area crossing the midline in the present case. This method can be a conservative and esthetic alternative treatment for preadolescent patients with anterior edentulous space including midpalatine suture.

References

1. Aydin MY (2004) Glass fiber reinforced composite in management of avulsed central incisor: a case report. J Dent Child 71:66–68
2. Iglesia-Puig MA, Arellona-Caborenro A (2003) Inlay fixed partial denture as a conservative approach for restoring posterior missing teeth: a clinical report. J Prosthet Dent 89:443–445
3. Song HY, Yi YJ (2003) Effects of two preparation designs and pontic designs and pontic distance on bending and fracture strength of fiber-reinforced composite inlay fixed partial dentures. J Prosthet Dent 90:347–353
4. Vallitu PK, Sevelius C (2000) Resin bonded glass fiber reinforced composite fixed partial denture: a clinical study. J Prosthet Dent 84:413–418
5. Chafaie A, Portier R (2004) Anterior fiber reinforced composite resin bridge: a case report. Pediatr Dent 6:530–534
6. Vallitu PK (1999) Prosthodontic treatment with glass resin bonded fixed partial denture: a clinical report. J Prosthet Dent 2: 132–135
7. Bjork A (1966) Sutural growth of upper face studied by the metallic implant method. Acta Odontol Scand 2:132–135
8. Auplish G, Darbar UR (2000) Immediate anterior tooth replacement using fiber reinforced composite. Dent Update 6:267–270
9. Heyman HO (2006) The Carolina Bridge: a novel interim all porcelain bonded prostheses. J Esthet Restor Dent 18:81–92
10. Ayna E, Celenk S (2005) Use of an alternative pontic foundation technique for a fiber reinforced composite fixed partial denture: a clinical report. J Prosthet Dent 93:412–415