



Partial Fixed Adhesive Prosthesis in Composite Resin reinforced with glass fiber: Clinical and laboratory aspects

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SUMMARY

Currently, in many dental procedures, adhesive restorative techniques have been applied, as they are easy to implement, present low cost and minimally invasive approach. This article describes and illustrates the preparation of a partial fixed adhesive prosthesis reinforced with glass fiber. The clinical case report demonstrates the rehabilitation of two upper premolars and discusses the biomechanical and esthetic principles described by the literature.

KEYWORDS

Composite Resin; Dental Esthetics; Operative Dentistry.

INTRODUCTION

Bacterial activity in the periodontal disease etiology, gum inflammation and occlusal trauma are characterized as co-factors in the progression of periodontitis, causing the destruction of supporting tissues and the loss of the dental element.

The absence of a tooth can destabilize the stomatognathic system leading to a functional and esthetic impact. In recent years, the evolution of Dentistry provided the use of new materials, expanding the alternatives to replace dental loss.

Dental adhesive materials have reestablished the patient's chewing function and esthetics in a quite satisfactory manner. Dental materials associated with restorative techniques provide greater preservation of pillar teeth because it is a minimally invasive technique with more conservative dental preparations compared to conventional fixed prosthesis¹.

The reinforced fibers are indicated for periodontal splinting², provisional restorations³, direct adhesive prosthesis, repairs in removable prosthesis, mainly in replacement of anterior teeth and in some cases of posterior absent teeth⁴.

The composites reinforced with glass fibers have been used in dental specialties and especially in restorative operative dentistry^{5, 6}. Glass fiber systems can be used to replace one or two missing teeth with a minimum wear of the tooth structure with low cost and clinical effectiveness⁷.

The use of the reinforced fibers associated with resins can provide a better clinical result if compared to resins with no reinforcement, optimizing the mechanical properties of the resin and providing more safety to the rehabilitation clinical procedure⁸.

This article reports a case of rehabilitation with partial fixed adhesive prosthesis in composite resin reinforced with glass fiber in order to restore the chewing function and esthetics.

CLINICAL CASE REPORT

Patient E.R.S.F., male, 46 years old, arrived at the Clinic of the Graduation degree course in Esthetic Dentistry at ABO-Barra Mansa-RJ, with the purpose of rehabilitating his right and left superior premolars.

At the initial clinical and radiographic examination, the absence of teeth 15 and 24 was noticed as well as the fact that the patient had a removable lower partial denture Kennedy class I. After the planning and the patient agreeing to the proposed treatment, the restorative process procedures started.

Dental preparations were performed (type inlay) with diamond tips 3131 and 4138 (KG Sorensen) on teeth 14 (occlusal-distal) and 16 (occlusal-mesial); teeth 23 (Palatine) and 25 (occlusal-mesial).

Then the molding was performed with addition silicone (Replic-Oraltech) using the simultaneous molding technique. The working models were obtained after being leaked in plaster type IV (Figure 1). Next, the plaster model was individualized in plastic-based die placement and the teeth involved in the treatment were isolated with a Cyanoacrylate glue (Superbonder-Loccite).

After preparation of the models, the adhesive prosthesis was manufactured in a laboratory using the Fibrex Lab and Fibrex Pontic (Angelus) system. Initially, the pontics were prepared and adapted to the prosthetic area. Silane (Biodinâmica) and Master Bond adhesive (Biodinâmica) were applied and light cured for 20 seconds (Figure 2). Then, the Fibrex Medial was adapted to the model with application of a high fluidity Master Flow resin (Biodinâmica) for horizontal reinforcement of the prosthesis (Figures 3 and 4).

Finishing the process of preparing the adhesive prosthesis, a micro hybrid composite resin was applied in the A3 Master Fill color (Biodinâmica) for the dentin reconstruction and a resin in the A2 color for the portion relative to the dental enamel. Each compound resin increment was light cured for 20 seconds (Figures 5, 6 and 7).

To seal the prosthesis, absolute isolation of the operative field and conditioning of the pleural preparations were performed with Phosphoric Acid 37% - Attack Gel (Biodinâmica) by 30 seconds in enamel and 15 seconds in dentin (figures 8 and 9) followed by the application of the adhesive system (Master Bond, Biodinâmica) with light curing for 20 seconds (Figures 10 and 11).

The bonding agent based on silane (Biodynamic) and Master Bond adhesive system were applied to the prosthesis for posterior sealing (Figure 12).

Resin sealant dual Master Cement (Biodinâmica) was prepared and applied in the prosthetics and also on pillar teeth using a Suprafill #1 (SS White) spatula. Immediately after, the prosthesis was inserted and light cured for 20 seconds on each pillar tooth. After the initial light curing, a complementary light curing was held for 40 seconds in the pillar teeth. The prosthetics were sealed one at a time following the same protocol (Figures 13, 14 and 15).

After removing the absolute isolation, an occlusal adjustment was performed with diamond tips of fine grain (KG Sorensen) and polished with Jiffy system (Ultradent). The occlusal contacts were evaluated, checking the occlusion at maximum intercuspation, in right and left laterality and in protrusion, and then, final polishing was carried out (Figures 16 and 17).

DISCUSSION

It is common to notice, these days, the evolution and constant improvement between the options of dental materials for rehabilitation treatments, providing the clinician with a large amount of options in prosthetic and restorative procedures⁹.

Adhesive prosthesis are a prosthetic alternative, considering their low cost and as a more conservative technique in relation to conventional fixed prosthesis. With the evolution of adhesive techniques and the association of composite resins with reinforced fibers, metal-free adhesive prosthesis may be indicated with greater safety and longevity^{10, 11}.

This type of prosthesis is a clinical alternative in replacing a tooth due to esthetic advantages, biocompatibility and ease of preparation. Moreover, it decreases the clinical work sections, being easy to install with the possibility of repairs and immediate esthetic result^{6, 12, 13}. Thus, the use of adhesive prosthesis with reinforced fiber allows restoring the edentulous space with function and esthetics^{14, 15} as observed in this clinical case report.

The application of prosthesis reinforced with fibers follows the requirements of conventional prosthesis, which should take into account the color, texture, space, provision of prosthetic teeth in the dental arch, as well as satisfy the principles of functionality, esthetics and comfort for the patient, which what was noted in the clinical case report².

It is also a less invasive treatment modality compared to the conventional fixed partial prosthesis. One of the main purposes of the adhesive fixed prosthesis is to rehabilitate reduced prosthetic spaces with minimal intervention being more conservative^{1, 4, 16}, which was demonstrated in the clinical case report.

Laboratory composite resins reinforced with fiber can be very useful in temporary solutions, especially in implant rehabilitations providing to the patient function and esthetics^{3, 17}. The use of resin composed with fiber glass for reinforcement increases the flexural strength of restorations made with composites, providing greater clinical longevity^{8, 18}.

The prosthetic clinical resolution for the absence of a single posterior tooth in patients who cannot be rehabilitated with implants has been a challenge for dental surgeons. The option for a fixed adhesive partial prosthesis made with composite resin reinforced with glass fiber is justified by the simplicity of the technique in both clinical and laboratory aspect as well by its low cost when compared to the conventional fixed prosthesis and prosthesis over implant¹⁹.

FINAL CONSIDERATIONS

Adhesive Prosthesis reinforced with glass fiber is a viable clinical option for oral rehabilitations in reduced spaces and whose main advantages are low cost, ease of implementation and few clinical sections with fairly satisfactory clinical results to the patient.

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Photos

Figure 1 - Working Model



Figure 2 - Pontics adapted for the prosthetic area



Figure 3 - Fibrex Medial - prosthesis infrastructure



Figure 4 - Fibrex Medial - prosthesis infrastructure



Figure 5 - Finalized prosthesis in the model



Figure 6 - Finalized prosthesis in the model



Figure 7 - Finalized prosthesis in the model



Figure 8 - Acid etching

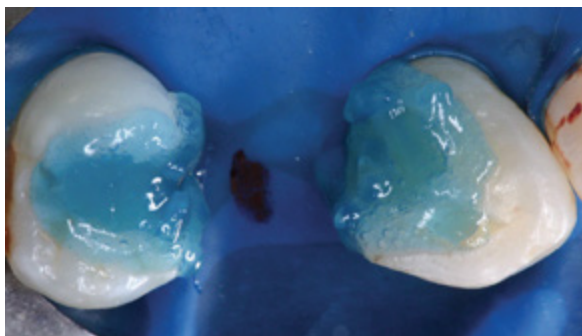


Figure 9 - Acid etching

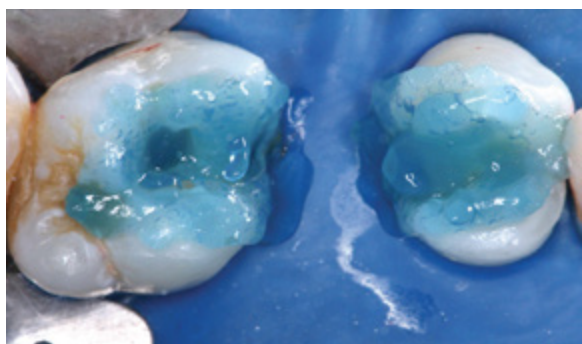


Figure 10 - Application of adhesive system



Figure 11 - Application of adhesive system



Figure 12 - Pre-silanized adhesive prosthesis



Figure 13 - Sealed adhesive prosthesis



Figure 14 - Sealed adhesive prosthesis

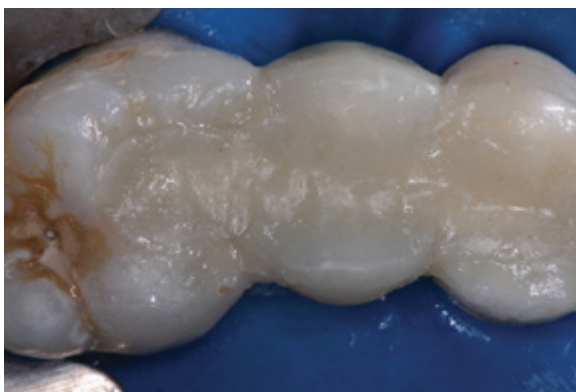


Figure 15 - Sealed adhesive prosthesis in occlusal view



Figure 16 - Final clinical aspect



Figure 17 - Final clinical aspect

