Adhesive Prosthesis in Composite Resin Reinforced with Fiberglass: A Clinical Alternative in the Rehabilitation of Missing Teeth

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Abstract

Fixed partial adhesive prostheses are a viable alternative for the replacement of one and even two missing teeth. They are inexpensive, quick and easy to perform and minimally invasive when compared to fixed partial prostheses. Associated with a reinforcing material such as fiberglass, they support the masticatory loads, increasing the flexural strength of the composite. The objective of this study is to report in a clinical case the laboratory and clinical preparation steps of a fixed partial adhesive prosthesis made of composite resin reinforced with fiberglass to restore function and aesthetics for the patient.

Keywords

Prosthesis. Composite resin. Fiberglass. Reinforcement fiber.

Introduction

In recent years, restorative techniques aimed at preserving the dental structure have been raising significant attention in clinical practice[1,2].

With the improvement and development of adhesive restorative materials, modern dentistry provides several clinical options to restore aesthetics and masticatory function to the patient and professional satisfaction to the dental surgeon. An irreversible evolution in restorative techniques has been established by the use of ceramic and polymeric materials in detriment of metallic alloys[3-6].

The replacement of a dental element can be performed using fixed adhesive prostheses with greater conservation of the abutment teeth and making minimum cavitary preparations for the adaptation of the pontic. However, this rehabilitation technique requires reinforcement mechanisms to withstand the masticatory forces[7-10].

The use of fiberglass-reinforced polymers is relatively new in dentistry and has been widely used[11-13]. Fiberglass has a high flexural strength and absorbs and distributes the masticatory forces, improving the physical and mechanical properties of the composite, besides being an aesthetic material. It can be indicated with clinical success as a choice for reinforcement structure, performing a function similar to the metallic infrastructures in the fixed partial metal-ceramic protheses[14-17].

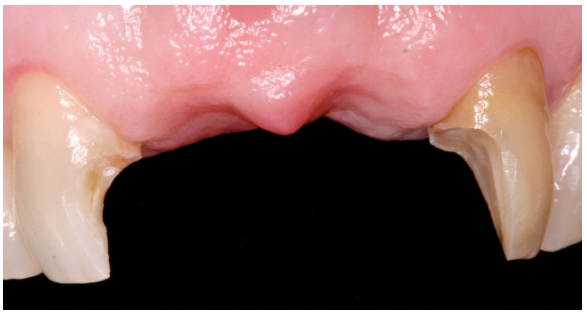
This paper reports a clinical case of prosthetic rehabilitation using a fixed partial adhesive prosthesis in composite resin reinforced with a fiberglass infrastructure in order to restore the masticatory function and aesthetics to the patient.

Clinical Case Report

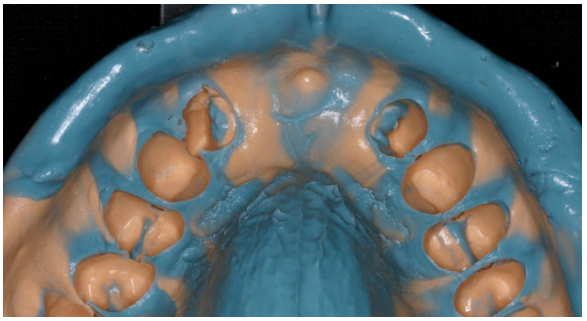
A male patient sought the Post-Graduation Clinic of EAP ABO-Barra Mansa-RJ, to rehabilitate missing teeth 11 and 21 and replacing its upper removable partial prosthesis (Figure 1).

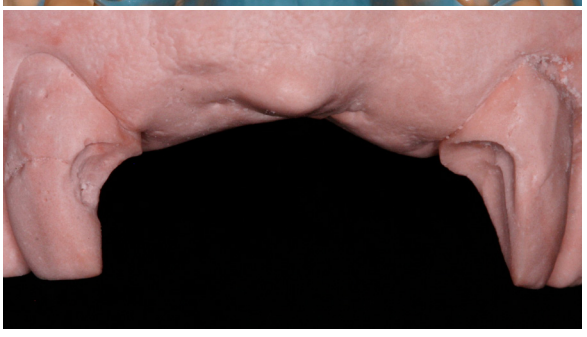
In the initial clinical and radiographic examination, there was absence of teeth 11 and 21 (Figures 2 and 3). The patient had a superior removable partial prosthesis that rehabilitated the missing teeth. After planning and diagnostic wax-up in study models and the patient agreeing with the procedure, the rehabilitation treatment was started (Figures 4 and 5).

Dental preparations with diamond tips 3131 and 4138 (KG Sorensen, Brazil) were performed on teeth 12 and 22 (mesio-vestibulo-palatine), initially removing the composite resin restorations and subsequently establishing an inlay preparation, according to Gomes et al., 2004 (Figure 6).



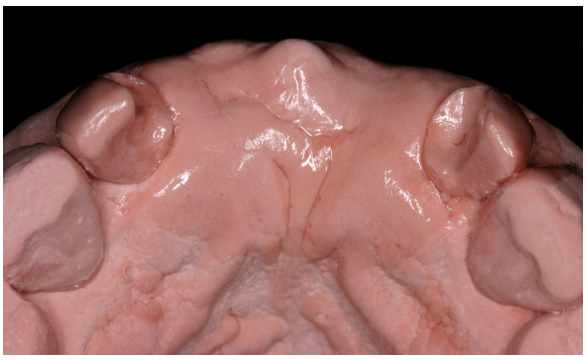
The molding was performed using the two-stroke technique, applying an addition silicone (HidroXtreme, Coltene, Vigodent, Brazil) and a gingival retraction cord #00 (Retraflex, Biodinâmica, Brazil) and then the working models were made in type-IV gypsum (Durone, Dentsply, Brazil) (Figures 7 and 8).

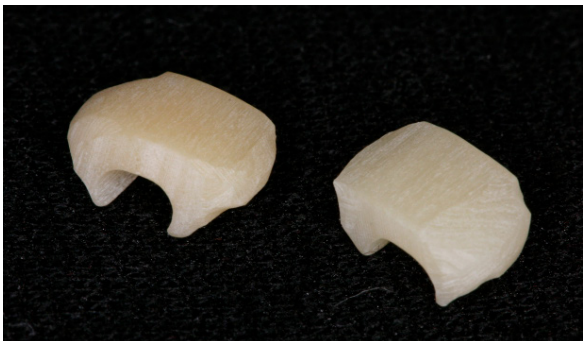


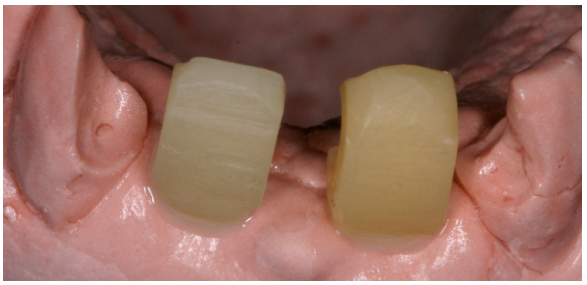


A provisional fixed adhesive prosthesis in a bisacrylic resin (Provi Plast, Biodinâmica, Brazil) was sealed with a provisional zinc oxide-based sealer without eugenol (Provicol, Voco, Germany), restoring function and aesthetics to the patient (Figures 9 and 10).

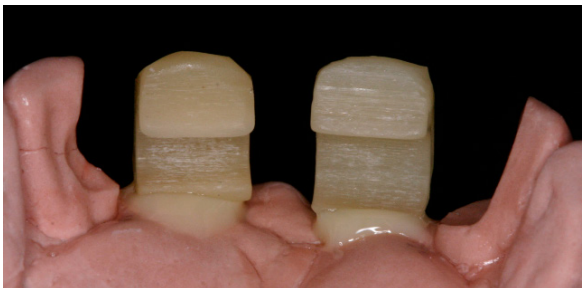
After the preparation of the models, the adhesive prosthesis was produced. Initially, the cyanoacrylate model (Super Bonder, Loccite, USA) was isolated (Figure 11) and the pontic was prepared (Fibrex Pontic, Angelus, Brazil), observing the adaptation to the model (Figures 12 and 13).

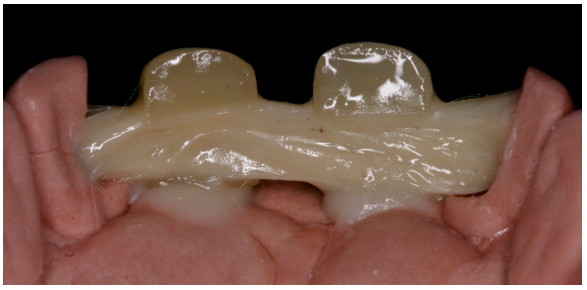






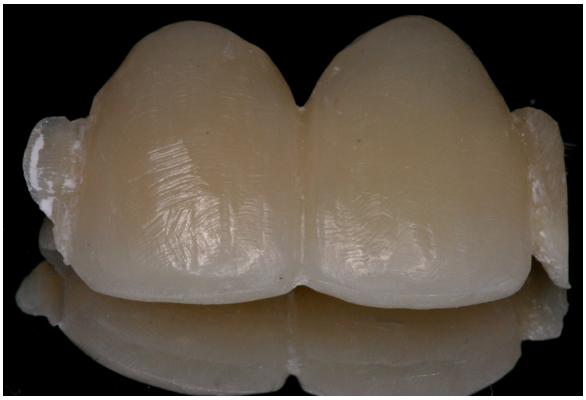
With the pontics prepared, silane (Angelus) and adhesive were applied and it was adapted to the model using a flow resin (Grandioso Flow, Voco, Germany) (Figures 14 and 15). Then, a Fibrex Medial fiberglass (Fibrex Lab System, Angelus, Brazil) was applied, constituting the horizontal reinforcement of the fixed partial adhesive prosthesis (Figures 16 and 17).



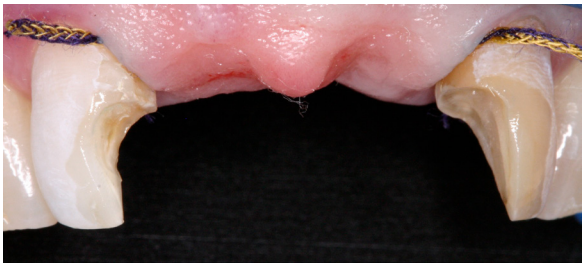


After completing the fiberglass infrastructure of the fixed adhesive prosthesis, the aesthetic coating with composite resin (Grandioso, Voco, Germany) was performed (Figures 18 and 19).

Each layer of composite resin was photoactivated with a halogen lamp apparatus (Ultralux, Dabi-Atlante, Brazil) for 20 seconds and an additional thermopolymerization of the entire adhesive prosthesis in autoclave was performed for 15 minutes to promote a more efficient polymerization of the resinous material, according to Gomes et al., 2004, finishing the laboratory stage of the prosthesis production (Figure 20).



The surgical field was isolated and then the subsequent etching of cavity preparations (Fusion Duralink acid, Angelus, Brazil) was performed for 30 seconds, the preparations were washed and dried and the adhesive system (Fusion Duralink, Angelus, Brazil) was applied, initially with the primer and then the adhesive with photoactivation of 20 seconds (Figure 21).



The treatment of the part in the internal portions of the pillar teeth consisted of the application of silane (Angelus, Brazil) and adhesive, only BISGMA (Fusion Duralink, Angelus, Brazil). Resinous sealer (Bifix QM, Voco, Germany). The prosthesis was adapted to the pillar teeth with the sealer applied to the preparations, the excess was removed with a suprafill #1 spatula (SS White, Brazil) and each face of the teeth was photoactivated for 60 seconds (Figures 22 and 23).

After the removal of the absolute isolation, the occlusal adjustment was performed with fine-grained diamond tips (KG Sorensen, Brazil) and the polishing was made with Diamond Master System (FGM, Brazil) (Figure 24). The occlusal contacts of the patient were examined checking for maximum habitual intercuspation, in right and left laterality and protrusion, and then the final polishing was performed (Figures 25, 26 and 27).

Final Considerations

The fixed partial adhesive prosthesis with composite resin reinforced by fiberglass is a less invasive clinical alternative when compared to the conventional fixed partial prosthesis.

An appropriate planning is important for a successful treatment with fixed partial adhesive prostheses.

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