

Resin composite build-ups for complementing multidisciplinary esthetic and functional dental treatments: a case report

Reconstruções em resina composta como complemento de tratamentos multi-disciplinares estéticos e funcionais: relato de caso

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ABSTRACT

Discrepancies in tooth shape and placement of the anterior teeth represent an uncomfortable esthetic scenario for many patients. Even the current composite resin proximal build-up is considered to be practical and conservative, and in some cases, an interdisciplinary approach with orthodontics optimizes the functional and esthetic results. This case report describes the management of a patient with complaint of the anterior esthetic, which compromised her quality of life. The correct diagnosis and the treatment with an interdisciplinary strategy are highlighted to offer a reliable and promissory treatment.

KEYWORDS

Esthetics, Dental; Composite resin; Diastema.

RESUMO

Discrepâncias na forma e no posicionamento de dentes anteriores representam desconforto estético para muitos pacientes. Reconstruções em resina composta, mesmo sendo consideradas procedimentos práticos e conservadores, em alguns casos, necessitam de uma complementação interdisciplinar com aparatos ortodônticos para otimizar os resultados estéticos e funcionais. Este relato de caso descreve a gestão de um quadro de queixa estética de um paciente com comprometimento da qualidade de vida. O correto diagnóstico e tratamento com uma estratégia interdisciplinar são destaque para oferecer um tratamento viável e promissor.

PALAVRAS-CHAVE

Estética dental; Resina composta; Diastema.

INTRODUCTION

Currently, practitioners face an increasing demanding population who want an ideal appearance. The search for excellence in the beauty of the smile is evident, influencing personal and professional relationships [1]. In this scenario, optimizing the smile is mandatory to promote improved facial harmony. Adhesive dentistry with adjunctive employment of composite resins is favorable for direct restorations and is a conservative procedure to alter dental details, minimizing dental wear [2].

Continuous advances in adhesion and improved mechanical and aesthetic properties of composite resins caused a significant change in dental practice [3]. In addition to the variety of colors, composite resins can reproduce the details of translucence and opalescence [4]. If they are correctly applied, they are the primary material of choice, providing teeth's natural color and texture practically imperceptible to human vision [4], thus assuring an aesthetically pleasant aspect. Also, this procedure is of lower cost compared to ceramic materials and allows reparability [1].

The most common aesthetic procedures involve the diastema closure, and modification of the shape of the anterior teeth, from lateral incisor to central incisor, canine or conoids to lateral incisor [5]. For the resolution of these cases, the strategy based on multidisciplinary treatment seems to be suitable for a successful balance between aesthetic and functional factors [6-8].

Correct diagnosis and planning are essential steps to guarantee reliable results, in which photographs and casts analysis are very helpful [1].

The aim of this study was to present a clinical case of recontouring anterior teeth to achieve aesthetic harmony upon completion and stabilization of orthodontic treatment and bleaching.

CASE REPORT

Figure 1 shows the smile of a 20-year-old female patient with the absence of the right lateral incisor (#12). In the next stage, the patient was treated with orthodontic movement to place canine #13 in the lateral incisor space, and the premolar #14 in the placement of the



Figure 1 - Preoperative photograph. Note the unevenly distributed interdental spaces among the maxillary anterior teeth and little midline deviation to the right side of the maxillary arch.

canine. After the orthodontic treatment, the patient reported that she had been submitted to a bleaching procedure and related her satisfaction with the dental color.

After these procedures, diastema between the central incisors still segregated her smile. The left lateral incisor (#22) also contributed to the unpleasant smile, since it was smaller than the other lateral incisor. Additionally, a discrete but noticeable deviation of the upper midline shifted to the right side. This is due the absent of right lateral incisor (#12) even after she underwent previous orthodontic treatment.

Treatment planning was discussed with the patient with the aid of cast models and the photographs taken during the examination. It included diastema closure and correction of the size and the shape of the anterior teeth with composite resin. A wax-up model of the six anterior teeth was created to serve as a model to obtain a mock-up (Figure 2). This technique has been promissory to enable the patient to visualize the aesthetic outcomes of all treatment alternatives. The mock-up was made with Protemp 4 bis-acryl resin (3M ESPE Dental Products, St. Paul, MN, USA) (Figures 3-4).



Figure 2 - Wax up study. A silicone putty index made from the wax up.



Figure 3 - The silicone putty index with bisacrilic resin in position to do the mock up.

Practitioners highlighted the harmonic aspect and the conservation of gingival health, which are advantages of this technique (Figure 4). The patient was very excited with the perspectives of treatment and therefore, she decided to continue.

In the next appointment, the resin color selection was performed according to the recommended cares. The selected composite resin was the Empress Direct (Ivoclar Vivadent Ltda., Schaan, Liechtenstein), B1D, BL-XLE and trans-opal.

After application of infiltration anesthesia (SS White, Rio de Janeiro, RJ, Brazil), a rubber dam was used with modification. It allowed better visualization reconciled with easier



Figure 5 - The silicone index positioning to observe where some burnouts should be done.



Figure 4 - The mock up with bisacrilic resin.

operative manipulation, especially for the access to the correct placement of the silicone mould. Thus, it was used to guide and evaluate the teeth to be reconterred (Figure 5).

Overall enamel roughening was performed to enhance bonding to the enamel (Figure 6). In sequence, # 000 cord (Ultrapack, Ultradent Products Inc., South Jordan, UT, USA) was positioned in the gingival sulcus of teeth # 14, 13, 11, 21, 22 and 23 for better access to the gingival contour of the restoration and adequate emergence profile.

The buccal, palatal and incisal surfaces of the anterior maxillary teeth were etched for 30 s with a 37% phosphoric acid-containing gel (Dentsply Ind. e Com. Ltda., Petrópolis, RJ, Brazil). The gel was thoroughly removed with



Figure 6 - The burnouts with diamond bur.

water spray for 20 seconds. After drying, two coats of a two-step bonding agent were applied (Adper Single Bond 2, 3M ESPE Dental Products, St. Paul, MN, USA). Solvent was evaporated after each coat and light-cured for 20 s with LED Radii-cal (SDI, Bayswater, Victoria, Australia).

To build up the palatal surface and incisal edges, the trans-opal resin color composite was deposited onto the internal surface of the silicone putty mould (Figures 7-8). In the next step, composite resin color B1D was used, since it was slightly more opaque, it helped to create a visual perception closer to dentin. In the final insertion, the trans-opal composite resin was used again in the proximal region, completing and defining the interproximal tooth contour. This step required special care to establish a contact point, and so the use of a brush, polyester matrix and proper spatula were essential.

The last layer with BL-XLE composite resin was placed on the buccal enamel. Polymerization

was performed for 40 s for each increment of direct composite resin and after the end of the restoration, an extra polymerization (60 s) was performed (Figure 9).

After completion of the restoration, the retraction cord and the rubber dam were carefully removed. With a #12 blade scalpel, the excess composite resin was removed. Finishes were performed using the sequence of Sof-Lex discs (3M ESPE Dental Products, St. Paul, MN, USA) (Figure 10).

Occlusal adjustment was performed. A new appointment was scheduled after one month to promote polishing with Sof-Lex discs and diamond felt disc. At this time, special attention to proximal contact was taken, promoting their finishing utilizing strips of sandpaper (KG Sorensen, Cotia, SP, Brazil) without losing contact (Figure 11). The final result is presented in Figure 12.



Figure 7 and 8 - The use of the silicone index to build the palatal wall.



Figure 9 - The use of the silicone index to build the palatal wall.



Figure 10 - Finishing with sanding discs



Figure 11 - Finishing proximal areas with strips of sandpaper.



Figure 12 - Post-op dental view.

DISCUSSION

After orthodontic treatment, restorative procedures are sometimes an interpreting recourse to optimize the more esthetical characteristics. This is a strategy that has been increasingly adapted for multidisciplinary approaches [7,9,10].

The correct diagnosis is crucial, since the tooth structure conservation, even minimally, is one of the main goals to be achieved [11].

Direct composite resin restoration is the technique that associates minimally invasive techniques with excellent cosmetic results [4], considering the young age of the patient. It was possible to resolve the case in a single session with minimal wear of tooth structure, yielding the desired recontouring.

The diagnostic wax-up, among other attributes, permits training for the proper execution of the format of esthetic restorations. Wax allows adding/removing, or rekindling round angles to visualize and evaluate the harmony with the other teeth. It provides a local guide where the wear should be performed on the buccal aspect. Waxing should always be done by a professional with strategic knowledge of the forms and details of the teeth [12]. In addition, the diagnostic wax enables to simulate the outcome to the patient through the mock-up, thus reducing their anxiety disorders [1]. The mock-up can help in assessing the patient for their aesthetic, since it allows to preview aspects

such as size, shape and length of the teeth, and, if necessary, can also suggest a modification [11,13]. The phonetics, occlusion and jaw excursive movements should be evaluated during the mock-up [13], which also allows for adjustments if necessary.

In this case, there was the absence of a lateral incisor and the harmony had to be adjusted with the size of the teeth. The method used to obtain the harmony was standardized photographs that were evaluated by dental professionals. This method was considered effective and reliable for assessing the dentofacial esthetics [14,15]. Even with little midline deviation, the final result was symmetrical and harmonious.

The development of an adhesive technique on the enamel and dentin substrates altered the concept of cavity preparation for teeth, and dentists can perform restorations with maximum tooth structure preservation without tooth wear [3].

Direct recontouring with composite resin in a healthy tooth structure is highly favorable and recommended. The right indication choice and well done technique in association with good materials, provides a harmonic smile in a short time [2]. This technique has advantages over ceramic restorations, since it is a non-invasive treatment, with virtually no tooth structure wear, and it is faster and more efficient [16,2,10]. Thus, the Empress Direct nano-hybrid composite resin was chosen, which features easy handling, excellent cosmetic results with longevity and the final polishing was very satisfactory.

For an optimal clinical outcome, the selected resin based composites should match the shade and translucency of the surrounding natural teeth. The shade matching with polymerized resin composite is the best way to choose the right color. The nomenclature of a particular shade is represented differently according to the manufacturer [17]. If a dentist has several A1 composite resins by different manufacturers, for example, it is interesting to test all [4]. After polymerization, the color and translucency can change. These modifications are product and shade dependent. The clinical indication for trans opal shade is limited to esthetic anterior restorations to create the effects of opalescence and translucency present in natural enamel [18].

The esthetic result was good, with high patient satisfaction. Regular professional care and patient instruction are essential to maintain the pleasant aspect. Our patient was instructed to regularly floss before tooth brushing and to avoid liquids with strong pigment that might cause staining to the restoration, such as wine or black tea [19].

CONCLUSIONS

The time consumed for the diagnostic, planning, mock up and color choice for direct restorations, together with the dentist skills are fundamental to obtain optimal results, which include good esthetics, function, harmony and patient satisfaction.

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