


Conservative smile enhancement: a case report and brief review on multidisciplinary approach in aesthetic dentistry

Tratamento conservador de sorriso: um relato de caso e breve revisão sobre abordagem multidisciplinar na odontologia estética

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ABSTRACT

The gingival contour, the color of the teeth and the presence of interincisal diastema are seen as unsightly factors, being highly harmful from a social point of view. The present study aimed to report a comprehensive and conservative esthetic treatment executed with a multidisciplinary approach in a 20-year-old female patient that presented darkened teeth with poor spacing and excessive gingival display while smiling, as well as present a brief literature review on multidisciplinary approach in esthetic dentistry. After clinical examination and diagnosis, a treatment plan was elaborated to meet the patient's expectations with a conservative approach. After patient consent, therapy began with supervised home-based tooth whitening with 22% carbamide peroxide applied one hour/daily for 14 days, followed with gingival recontouring surgery and, after a healing period of 30 days, diastemas closure with direct composite resin technique, occlusal adjustment, finishing, and polishing. The multidisciplinary approach was fundamental for the accomplishment of the proposed treatment, achieving satisfactory esthetic and functional results.

Indexing terms: Dental esthetic. Operative dentistry. Tooth bleaching.

RESUMO

O contorno gengival, a cor dos dentes e a presença de diastemas interincisivos são vistos como fatores antiestéticos, sendo altamente prejudicial do ponto de vista social. O presente estudo teve como objetivo relatar um tratamento estético conservador executado com abordagem multidisciplinar em uma paciente do sexo feminino de 20 anos que apresentava dentes escurecidos com pouco espaçamento e exposição gengival excessiva ao sorrir, bem como apresentar uma breve revisão de literatura sobre à abordagem multidisciplinar em odontologia estética. Após exame clínico e diagnóstico, foi elaborado um plano de tratamento para atender as

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How to cite this article

Brasil AN, Lins-Filho PC, Dias MF, Teixeira HMM, Nascimento ABL. Conservative smile enhancement: a case report and brief review on multidisciplinary approach in aesthetic dentistry. RGO, Rev Gaúch Odontol. 2023;71:e20230040. <http://dx.doi.org/10.1590/1981-86372023004020220030>

expectativas do paciente com abordagem conservadora. Após consentimento do paciente, foi iniciada o clareamento dental supervisionado com peróxido de carbamida 22% aplicado uma hora/dia por 14 dias, seguido de cirurgia de recontorno gengival e, após um período de cicatrização de 30 dias, fechamento de diastemas com técnica de resina composta direta. Neste caso, a abordagem multidisciplinar foi fundamental para a realização do tratamento proposto, alcançando resultados estéticos e funcionais satisfatórios.

Termos de indexação: Estética dentária. Dentística operatória. Clareamento dental.

INTRODUCTION

Before adhesive materials, restorative techniques required the removal of a considerable amount of healthy dental tissue. With the evolution of dental materials and restorative techniques, it is now possible to correct pathological alterations and enhance esthetics while preserving the dental structure [1].

During esthetic rehabilitation planning, the main goal is to achieve a pleasing composition in the smile by creating an arrangement of various esthetic elements. Principles related to functionality, color, and texture must be considered [2,3]. Factors such as proportion, symmetry, and alignment of the teeth should also be analyzed, as well as the relationship between the smile and the gingival contour, gingival display in smile, lips and facial structure [4,5].

Anterior spaces may interfere with smile attractiveness and compromise dentofacial harmony. Interincisor diastemas can be corrected through different techniques and materials. The composite resin has excellent esthetic results with minimal wear and tear of healthy dental tissue, being considered a minimally invasive technique and is an excellent alternative, when well indicated, for achieving satisfactory results and reduced cost compared to dental ceramics [6,7]. The options for interincisor diastemas closure can go beyond the use of composite resin by the direct technique, depending on the clinical situation, surgery for gingival recontouring as well as correction with orthodontic appliances, fixed prostheses and ceramic laminates can be used [8].

Before clinical interventions, it is essential that the professional analyze and understand the etiology of the diastema, identifying whether its origin is related to anomalies in the number or size of the teeth, the insertion of the labial frenulum, deleterious oral habits or advanced periodontitis. An adequate clinical examination must include an intra and extraoral evaluation, observing in detail the occlusion, soft tissues, insertion tissues and the evaluation of the periodontal condition [9].

Multidisciplinary dentistry is an approach of different specialties on the diagnosis and treatment planning of oral health conditions. In the esthetic dentistry context, a multidisciplinary approach enables the dentist to provide the highest level of dental care to each patient, setting the esthetic objectives and considering the impact on function, structure, and biology [10].

This article reports a clinical case in which a multidisciplinary and comprehensive evidence-based approach was employed to enhance esthetic in a patient that presented darkened teeth with poor spacing and excessive gingival display while smiling. The treatment comprised home-based chemically induced dental bleaching, gingival surgery, and dental re-anatomization with direct resin composite technique.

CASE REPORT

A 20-year-old female patient visited the dental clinic of the Dentistry course of the Faculdade de Odontologia de Pernambuco-FOP/UE (Camaragibe, PE) reporting dissatisfaction with her oral esthetics. During clinical examination, interincisor diastemas were observed (figure 1A and 2E). In addition, the upper central incisors zeniths were at a lower height than the lateral incisors, as well as a discreet gyroversion promoting buccal displacement of the mesial faces of both upper lateral incisors. Occlusal stability, Angle class I, was observed with a slight lingual displacement of the upper central incisors. Clinical examination also revealed natural yellowing discoloration of the teeth. Finally, no caries or dental fractures were diagnosed, as well as good periodontal health.

A treatment plan was suggested in the following sequence: supervised home-based bleaching of the upper and lower teeth, gingival recontouring surgery and diastemas closure with direct composite resin technique. After patient acceptance of the proposed treatment plan, an informed consent form was signed in accordance with ethical standards. Hemogram, coagulogram, and fasting blood glucose tests were ordered to identify any surgical risk factors and support the choice of anesthesia and postoperative prescriptions.

To perform tooth bleaching, a 22% carbamide peroxide bleaching agent (Whiteness Perfect-FGM) was selected and delivered by an individualized tray. The product was applied for one hour/daily for 14 days, reaching the final color A1 assessed with the support of Vitta Classical scale (VITA shade) (figure 1B). It is important to emphasize that the patient did not report any signs of tooth sensitivity during bleaching.

Afterwards, the gingival recontouring surgery was performed. The upper central incisors were measured with a digital pachymeter (Amatools, Piracicaba, SP, Brazil), reaching a value of 8.32 mm for the right central incisor and 8.31 mm for the left central incisor (figure 1C). After periodontal probing, it was found the need to remove approximately 2mm of gingival tissue of the upper central incisors adjacent area. Less than 1mm of soft tissue was also removed from the lateral incisors mesial adjacent area, executing re-anatomization of the interdental papillae. Gingival tissue removal was performed by marking bleeding points, making external and internal bevel incisions, performing tissue removal with periodontal curettes.

A new periodontal probing was performed after removing 2mm of gingival tissue and a biological space of less than 2 mm was found in the upper central incisors, for this reason an envelope access technique was performed to the anterior region (figure 1D) and ostectomy of approximately 1.5 mm of bone tissue, obtaining a length of approximately 13 mm from the bone margin to the incisal border. Interdental suture was performed with resorbable thread (Vicryl, 5-0; Ethicon, Raritan, NJ, USA) (figures 1E).

After a healing period of 30 days (figure 2A), the color selection of the resin composite was carried out using the Vittra APS composite resin (FGM, Joinville, SC, Brazil) and resins EA1, DA1 were selected. Teeth conservative preparation was performed using fine-cut diamond burs (American Burrs, Palhoça, SC, Brasil). After absolute isolation of the operative field with a rubber dam, tooth prophylaxis was performed with pumice paste and water. The bonding procedures were then executed with 37% phosphoric acid etching (FGM, Joinville, SC, Brazil) for 30 seconds, washing with water/air

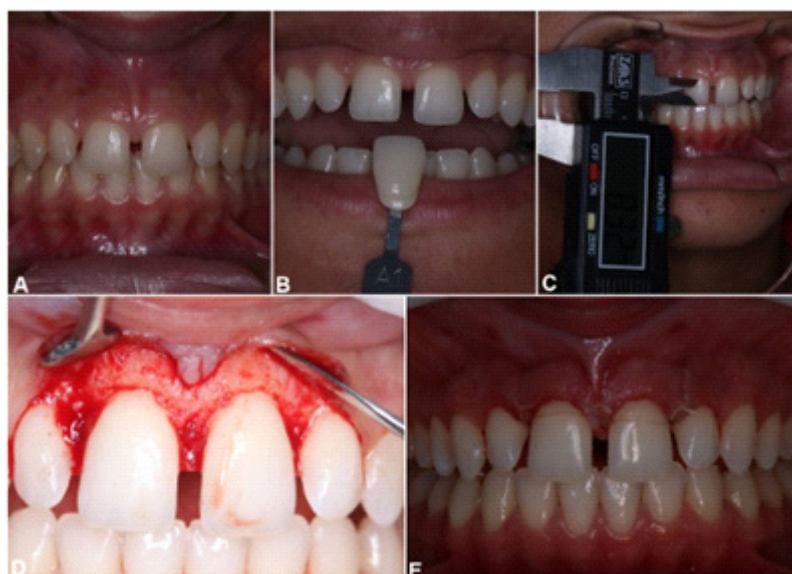


Figure 1. A - Initial aspect of the smile, presenting darkened teeth with poor spacing and excessive gingival display while smiling; B - Smile aspect after supervised teeth whitening with 22% carbamide peroxide, achieving A1 shade; C - Teeth measurement with aid of a digital pachymeter to plan width-to-height proportions; D - envelope access technique and ostectomy performed; E - Interdental suture performed with resorbable thread.

spray for the same amount of time, and, application of two layers of a etch-and-rinse bonding system Ambar APS (FGM, Joinville, SC, Brazil). After 20 seconds, air jets were applied to enhance solvent volatilization followed by light curing with a light-emitting diode (LED; SDI, Bela Vista, SP, Brasil) unit (10 seconds at 1,700 mW/cm²) (figure 2C).

Using the Vitta essential kit of composite resin (FGM, Joinville, SC, Brazil), the diastemas between all four upper incisors were closed (figure 2B). The occlusal adjustment and initial finishing were performed in the same session, finishing strips were used at the approximal regions. After 8 days, the finishing was completed using flexible sand discs, rubber points, and felt discs with polishing paste, thus concluding the clinical case according with the proposed treatment plan (figure 2D and F).

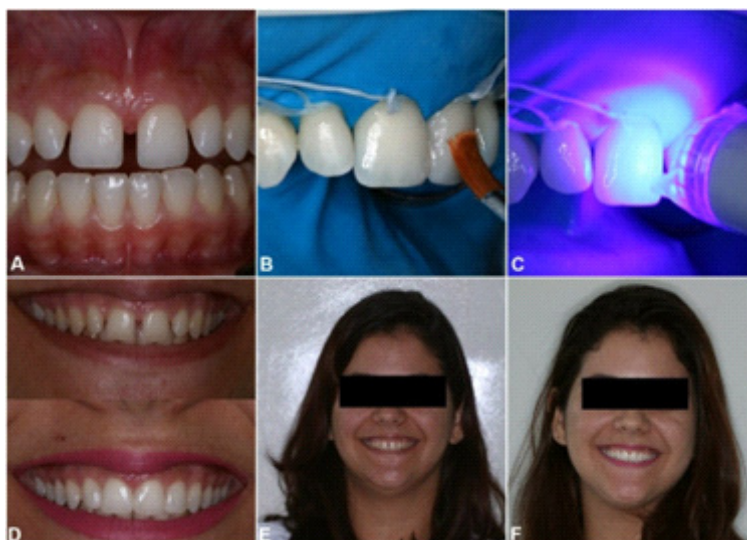


Figure 2. A - Postoperative appearance after 30 days; B - Direct resin composite restorative technique; C - Light curing with a light-emitting diode unit; D - Initial and final smile aspect comparison; E - Initial facial and smile proportions; F - Final facial and smile proportions.

DISCUSSION

Esthetic patterns are relative, depending on the individual's perception. It is up to the dentist to identify the patient's chief complaint and reach the desired result. However, if it does not affect the notion of doing what is correct for oral and systemic health, the patient's decision and limitations must be respected.

The interincisor diastema may or may not be a patient complaint. During the development of occlusion, there is a significant physiological closure, when verified the non-possibility of physiological closure, the treatment should be discussed. However, before any conduct, the most opportune moment to perform such procedure should be evaluated, based on solid knowledge on occlusion and on the etiology of the malocclusions. Persistence depends on the etiology, which is multifactorial and is generally related to positive tooth-bone discrepancy, microdontia, agenesis of the upper lateral incisors, sucking habits, supernumerary or erupted supernumerary teeth, hereditary and hypertrophic lip frenulum [11], which was probably one of the factors that caused the diastema observed in this case.

Minimally invasive restorative techniques present many advantages over more tissue-destructive traditional restorations by minimizing unnecessary tooth tissue loss, hazard to the dentine-pulp complex and reducing the risk of iatrogenic damage to adjacent hard and soft tissues. These techniques maximize the strength of the residual tooth structure by use of optimal adhesive restorative materials designed to restore function and aesthetics with long-lasting restorations [12].

In this case report, the choice of composite resin by direct technique for diastema closure has great advantages over the veneer's technique, which often requires a more invasive approach [8]. In addition, technological advances along with a better comprehension of the behavior of dental structure to light incidence have allowed the development of new composite resins with better mechanical and optical properties, making possible to artificially reproduce all the intrinsic characteristics of the tooth, providing excellent esthetic results with great cost benefits [13].

All the composite resin was used on dental enamel since the closure of the diastema by the direct technique is a minimally invasive procedure. This creates a greater bond strength at the tooth/adhesive system interface and consequently enhances treatment longevity, as the enamel bond, despite not having the participation of dentin collagen fibers, has greater bond retention [7].

Prior to the restorative procedures, tooth bleaching was performed. This procedure can be performed in the dental office, associated with light activation [14] or not, and at home by the patient [15]. Basically, this technique consists in removing intrinsic pigments from the patient's diet present in dentin [16], resulting in whiter teeth. In this study, the bleaching approach selected was at home tooth bleaching with the aid of customized trays and under professional supervision due to reduced in-chair clinical time required, lower cost in comparison to in-office techniques, and lower risk of tooth sensitivity [17]. Regarding the execution of whitening before gingival recontouring surgery, this decision was made due to the unavailability of the patient's schedule. However, due to thorough clinical planning and well execution, there was no negative impact on treatment outcome, as observed in figure 2D and F.

Esthetic crown lengthening is not only indicated when the anterior teeth are too short or in cases of excessive gingiva display [18] but also in cases of irregular gingival contour [19]. The objective of gingival recontouring is to establish an adequate relationship of the gingival margin with the lip, to increase tooth crown display, and to establish an esthetic harmony between the height and width of the crowns of anterior teeth [19]. Finally, this technique can be employed as a support to enhance the esthetics results in some cases of diastema closure with composite resin [20], as performed in the presented clinical situation.

The multidisciplinary approach was fundamental to achieve harmony on clinical crown dimensions with respect to their apparent mesiodistal width and width-to-height ratio, which was planned to be 80%. It is essential to plan dimensions and proportions so that the result of the treatment provides a more harmonic facial esthetic pattern to the patient, as can be seen in figure 2E and F.

Minimally invasive treatments that add multidisciplinary approaches have the potential to achieve results that meet the expectations of both professionals and patients with high predictability and low morbidity, factors associated with improved oral health-related quality of life, since it is known in the literature that dental esthetics affects how people are perceived by society and how they perceive themselves [21,22].

CONCLUSION

The use of a comprehensive multidisciplinary approach for enhancing smile esthetics, comprising the direct composite resin technique with periodontal surgery and tooth whitening, proved to be an excellent treatment option, as it presented satisfactory esthetic and functional results, in addition to reduced treatment time and cost when compared to other approaches, however, this treatment modality requires refined manual skills from the dentist.

Comprising different specialties on the diagnosis and treatment planning in esthetic dentistry enables the dentist to provide the highest level of dental care to each patient, setting the esthetic objectives considering the patient's expectations and limitations.

Collaborators

AN Brasil, conceptualization; data curation; investigation; methodology; writing - original draft. PC Lins-Filho, data curation; methodology; writing - original draft. MF Dias, investigation; methodology; writing - original draft. HM Teixeira, conceptualization; data curation; investigation; methodology. ABL Nascimento, conceptualization; data curation; investigation; methodology; project administration; writing - original draft.

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Received on: 21/4/2022

Final version resubmitted on: 19/1/2023

Approved on: 27/2/2023

Assistant editor: Luciana Butini Oliveira