

Minimally Invasive Therapy for Smile Correction using Gingivoplasty, Tooth Bleaching and Resin Composite Restorations

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ABSTRACT

A multidisciplinary approach and minimally invasive therapies are essentials to obtain effective results from aesthetic dentistry. Minimally invasive dentistry requires minimal intervention for the placement and replacement of restorations. The authors, hereby present a case of a 24-year-old female, who was dissatisfied with her dark and unsatisfactory dental restorations. After the clinical examination, it was proposed to perform a gingivoplasty, tooth bleaching and replacement of the unsatisfactory restorations with resin composite. Initially, the gingivoplasty was performed, which consisted of the following steps- periodontal probing, measurement of new zeniths and marking of bleeding points, internal bevelled incision and removal of the gingival collar with periodontal curettes. After healing period, using the combined technique, in-office bleaching was done with 35% hydrogen peroxide followed by three weeks at-home bleaching with 16% carbamide peroxide. The unsatisfactory restorations were replaced with resin composite according to dental substrate. Sequentially, occlusal adjustment, finishing and polishing with sanding discs and felt discs were performed. The multidisciplinary approach in the execution of the treatment was fundamental for the aesthetic harmonisation of the smile, providing health, well-being of the patient and professional satisfaction.

Keywords: Composite resins, Dental aesthetics, Tooth whitening

CASE REPORT

A 24-year-old female patient with a non remarkable medical history and no known drug allergies attended the Dentistry clinic complaining of darkened and unsatisfactory dental restorations which were performed four years ago. The patient reported that for at least two years, the restorations bothered her.

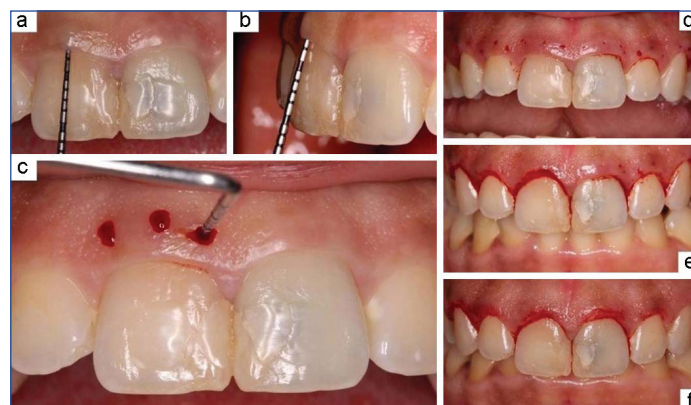
Intraoral examination revealed anatomical discrepancy between the length of the upper anterior teeth, excessive gingival display confirming type IA altered passive eruption (gummy smile) [1], and unsatisfactory restorations on teeth 11 and 21 [Table/Fig-1]. Also, the non vitality of the teeth was verified by pulp test and the patient was referred to an endodontist for the endodontic treatment on teeth numbers 11 and 21. Gingivoplasty, tooth bleaching and replacement of the unsatisfactory restorations with resin composite was the treatment plan.



[Table/Fig-1]: a) Anterior view of the smile; b) Anterior view of the smile with lip retractor; c) Occlusal/palatal view of teeth 11 and 21; d) Buccal view of teeth 11 and 21, enlarged.

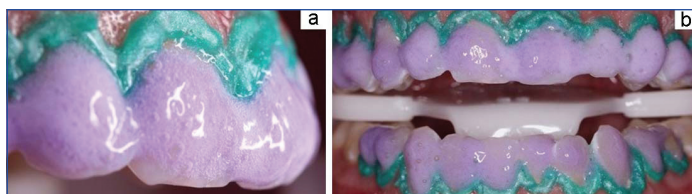
Initially, supragingival scaling with periodontal curettes associated with prophylaxis with pumice stone (Biodinâmica, Ibiporã, PR, Brazil) and water were performed, in addition to guidance on oral hygiene.

Under local infiltration of anaesthesia, a periodontal probing was performed with a millimetre probe and bleeding points were marked, delimiting the new gingival zenith. Subsequently, incisions were given with a 15C scalpel blade- intrasulcular and internal bevel incisions [Table/Fig-2]. After cutting the gingival margin, the tissue was removed with a periodontal curette and the healing period of 30 days was respected.



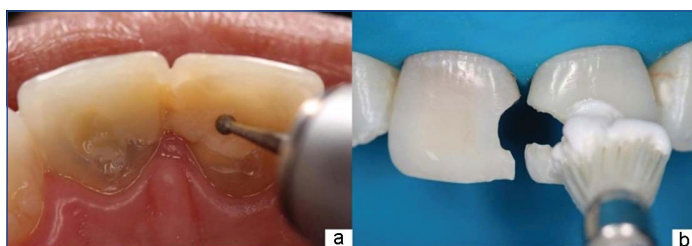
[Table/Fig-2]: a) Survey previous view; b) Probing side view; c) Marking of bleeding points; d) Enlarged anterior view of bleeding point markings; e) Anterior view of the gingival repair; f) Final clinical appearance of gingival repair.

After this step, tooth bleaching treatment was started. Initially, the colour evaluation was performed with the Vita classic scale (A3). Impressions of the upper and lower arches were made with alginate, cast was poured with special plaster (Coltene, Rio de Janeiro, Brazil) to obtain arch models, and individual trays were made with siliconised plates (1 mm) in a vacuum plasticiser. The patient was instructed on the use of the bleaching gel containing 16% carbamide peroxide (FGM, Joinville, SC, Brazil) once a day for four hours for 21 days, according to manufacturer's instructions. Three sessions of in-office bleaching with 35% hydrogen peroxide whitening gel (FGM, Joinville, SC, Brazil) were also performed with 7-day intervals between sessions [Table/Fig-3].

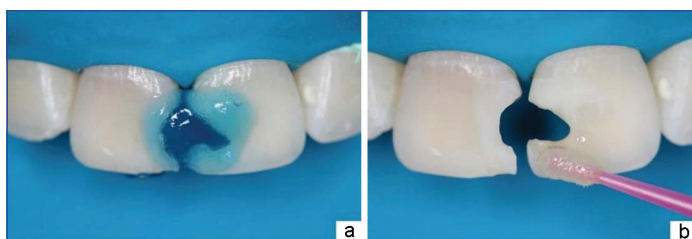


[Table/Fig-3]: Gingival barrier and 35% hydrogen peroxide bleaching agent. a) side view; b) enlarged front view.

After obtaining the final result of tooth bleaching VITA classic scale A1, unsatisfactory restorations were removed from the teeth 11 and 21. Subsequently, prophylaxis was done and composite resin colour compatible with the dental substrate was chosen [Table/Fig-4]. Etching was carried out with 37% phosphoric acid for 30 seconds in enamel and 15 seconds in dentin. Then, the conventional adhesive (FGM, Joinville, SC, Brazil) was applied with a disposable brush followed by jets of air to volatilise the solvent and polymerisation for 20 seconds was done [Table/Fig-5].



[Table/Fig-4]: a) Palatal view removal of unsatisfactory restoration with spherical diamond tip #1016; b) Robinson brush prophylaxis and pumice and water paste.

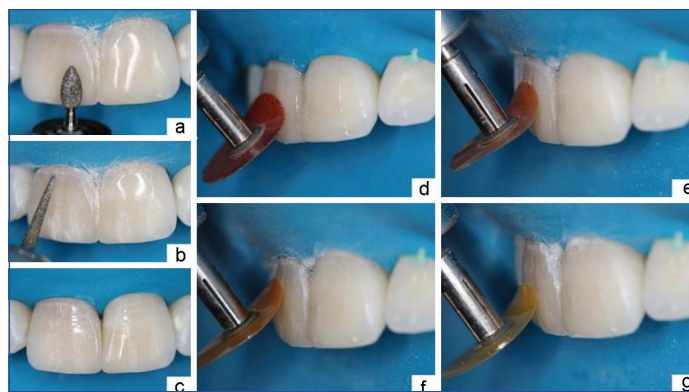


[Table/Fig-5]: a) Application of 37% phosphoric acid for 30 sec on enamel and 15 sec on dentin and removal with water/air spray for twice the time and drying with air jets; b) Application of the adhesive in two layers, solvent volatilisation with light air jets and polymerisation for 20 sec.

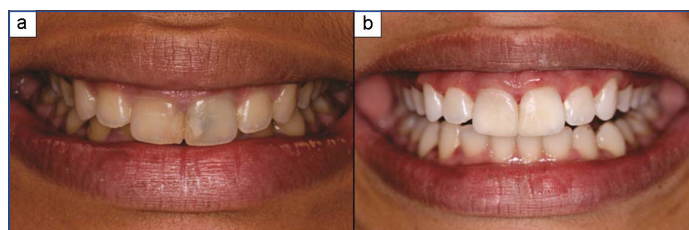
The restorative procedure was performed using the free hand technique and insertion of increments of composite resin. Initially, Trans N resin was used for the palatine shell conformation (polymerisation for 20 sec). Subsequently, increments of resin with opacity corresponding to dentin (DA2) were inserted (polymerisation for 40 sec) and, finally, the buccal surface was covered with composite resin with translucency compatible with enamel (EA1). In the last layer, a composite resin modeller was used to assist in the surface smoothness of the restoration and accommodation of the composite resin [Table/Fig-6]. At the end of the restorations, occlusal adjustment was performed and the finishing and polishing was carried out with Sof-lex Pop on sanding discs (3M, Saint Paul, Min, USA) and felt discs (TDV, Pomerode, SC, Brazil) [Table/Fig-7]. After all these multidisciplinary approaches, the patient was satisfied with the dental treatment performed [Table/Fig-8]). The patient was recalled after one week for follow-up and the aesthetics were well-maintained.



[Table/Fig-6]: Restorative procedure after resin insertions.



[Table/Fig-7]: In sequence, adjustments were made with the #3118 candle flame and the pencil #3200 conical diamond tips. Finishing and polishing restorations. Following D-G, finer grit to finer grit.



[Table/Fig-8]: a) Initial appearance; b) final appearance of the treatment.

DISCUSSION

Aesthetic rehabilitations with multidisciplinary treatments have become a challenge for the dental surgeon. In this way, it is essential to diagnose and outline an adequate therapeutic plan, in order to obtain satisfactory results in a conservative way [2].

Excessive gingival display can be treated by gingival plastic surgery, which remodels, eliminates the excessive exposure of gingiva, and shows the correct dimensions of teeth [3]. A recent study showed excellent results after surgical treatment, improving functional and aesthetic aspects, as well as, addressing patient aesthetic expectations [4].

To create a harmonious and aesthetic smile, it is necessary to analyse the symmetry between the contours of the lips, shape of the teeth, gingival contour and the facial shape [5]. In the case presented, a slight gingival excess was identified, confirming the diagnosis of type IA altered passive eruption [1]. After the diagnosis, a gingivoplasty was proposed, which made it possible to value the anatomical characteristics and improve the proportion of dental zenith [2].

In addition to the red aesthetics, the white aesthetics is a key element in the composition of a smile. Tooth darkening, for example, is one of the main disharmonies perceived in teeth in social interaction [6]. In order to reverse tooth chromatic changes, tooth bleaching is a procedure widely performed [7]. In the present case report, to perform tooth bleaching, a combined technique was chosen, which consisted of three weekly sessions of in-office tooth bleaching with 35% hydrogen peroxide whitening gel and supervised bleaching with 16% carbamide peroxide. This combined technique allows a safer clinical treatment for the patient, with longer lasting results compared to only one of the techniques, in addition to promoting greater speed in terms of patient and professional expectations [8]. After 15 days of bleaching treatment, the result was considerably satisfactory.

In a randomised clinical trial study by Kothari S et al., (2020) [9], patients were firstly subjected to in-office bleaching with 37.5% hydrogen peroxide, in three sessions, and then supervised bleaching with 10% carbamide peroxide for 14 days [9]. Through visual evaluation by a digital spectrophotometry device, the evaluators observed better results in bleaching with the combined technique. It is also important to emphasise that in the present case report, the bleaching procedure was performed previously replacing the unsatisfactory restorations, which allowed less wear of healthy tooth tissue, increases final result quality and dental luminosity [2].

On the basis of the conditions observed, replacement of unsatisfactory restorations was proposed using the direct or indirect technique. The indirect technique with ceramic laminates or composite resin enables good biological compatibility and excellent clinical results, however, this technique requires greater tooth wear and laboratorial steps [10]. However, in the present study, direct restorations with composite resin were performed to reduced chair side time, preserve the remaining tooth tissue, for good aesthetics, and a good cost-benefit ratio [2].

At the end of the restorations, the finishing and polishing was carried out. This clinical step should not be neglected, as it provides greater surface smoothness of the restoration, minimises the deposition of bacterial plaque, hinders the pigmentation of the composite resin and provides greater clinical longevity [11]. According to a previous study by Jang JH et al., (2017) the use of Sof-lex Pop on sanding discs, which were used in this study, promotes better surface shine, colour, and good marginal adaptation [12].

Thus, based on the results obtained in the present clinical case, the present study reinforces the importance of multidisciplinary treatment to achieve a satisfactory aesthetic functional result and patient satisfaction.

CONCLUSION(S)

Multidisciplinary was essential for the execution of present clinical case of aesthetic harmonisation of the smile. Aesthetic dental treatments must be conservative and sensible, providing well-being and health to the patient. A conservative approach with reduced tooth wear was sufficient for the smile aesthetic improvement.

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