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Case Report Article

Esthetic rehabilitation of anterior teeth through gingival recontouring and ceramic veneers: a case report

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Abstract

Introduction: Esthetic rehabilitations require a broad and thorough evaluation of all the elements that make up the smile such as lips, dental, and periodontal structures to plan the treatment to provide harmony to the whole set. **Objective:** To demonstrate through a case the association of Periodontics and Restorative Dentistry in the esthetic rehabilitation of anterior teeth replacing resin restorations by modifying the gingival architecture conservatively and harmonically. **Case report:** It is essential for a multidisciplinary approach to succeed in treatment. The replacement of previous restorations is an increasing demand in currently clinical practice, for many reasons, mainly due to dissatisfaction with the esthetics. It is observed that many of these patients involve not only dissatisfaction with the dental structure but also with the periodontal health, for this reason, it is necessary a previous adaptation of the gingival tissues for proper restorative rehabilitation. **Conclusion:** Ceramic laminates have proved to be a great choice for anterior teeth restorations, but they must be indicated in specific situations, to obtain excellent results as most conservative as possible.

Introduction

Different techniques can be used to correct esthetic disharmonies of anterior teeth, such as orthodontic treatment, restorative treatment with resin composite or ceramics, and even the combination of both techniques, starting with the orthodontic correction and ending with restorative treatments. In some less extensive situations, for example, small diastemas or small asymmetries, restorations in resin composite should be considered. However, these restorations should be replaced after some years due to degradation and staining typical of this material [12].

Currently, the dental ceramics is increasingly indicated and demonstrated many versatility for different situations, consequence of the great technical advancement of this material in the last years. When ceramics are indicated correctly and judiciously, they can be as conservative as the resin composite, enabling reaching excellent esthetics [6]. However, some care should be taken with this treatment, such as the additional laboratorial cost, need of greater number of appointments, and eventual need of provisional restorations.

The adequate relationship between the periodontal health and restorative procedures should be observed, regardless of the choice or preference of the material to be used. A previous periodontal treatment, with scaling or surgeries, together with a restorative approach respecting the periodontal biological distances is fundamental for the functional, esthetic, and long-term treatment success [1-3].

This study aimed to report the esthetic technique of the smile rehabilitation by replacing the resin composite restorations by ceramic veneers associated with previous periodontal treatment of gingival recontouring.

Case report

Patient, female, aged 37 years, was referred to the clinics with main complaint of smile esthetics, especially regarding color, shape, and size of the anterior teeth. The initial procedures comprised the anamnesis, clinical, and radiographic examinations. At initial clinical examination, we observed the presence of maladapted, stained, and worn resin composite restorations. The smile analysis revealed disproportionate sizes of the anterior teeth, inflammation of the surrounding periodontal tissues, and misaligned gingival architecture.

We opted to perform the previous periodontal treatment and gingival recontouring surgery aiming at reestablishing the periodontal health and reshape the gingival arch harmony. For such procedure, the maxillary and mandibular arches underwent impressions with condensation silicon to obtain working casts to construct a surgical template. Based on the smile analysis, the periodontal surgery

was performed on eight anterior teeth through flap periodontal surgery, osteotomy, and osteoplasty. The surgical following-up was performed for three months.

After tissue healing, a new impression with condensation silicon to obtain the diagnosis waxing-up of the restorations. Also, the in-home tooth whitening was carried out by using the trays at night with 10% carbamide peroxide, for three weeks.

The wax-up enable the construction of a silicon template. The bis-acryl resin Protemp 4 (3M ESPE) was injected into the template to obtain the mock-up. Thus, the patient could experience the change in tooth shape, enabling the outcome predictability. After the patient approved the treatment, and impression was taken with the mock-up in place with the aid of heavy-putty addition Express XT (3M ESPE), with a relief for further impression of the tooth preparations. The tooth color shade was obtained with Vita Classical guide.

The resin restorations were removed with diamond points and sandpaper discs Sof-Lex Pop-on (3M ESPE). After the preparation finishing, a retractor cord #000 (Ultrapack Ultradent) was inserted. The impression was used with a customized tray with the light-putty addition silicone Express XT (3M ESPE).

Once the preparations were ultraconservative and the patient was already familiarized with the diastemas, we opted to not construct provisional crowns. The ceramic laminate veneers were constructed with IPS e.max Press, which are lithium disilicate reinforced glass ceramics, resulting in a very thin laminate with high translucence and excellent adaptation.

Prior to cementation, the laminates were conditioned with 10% hydrofluoric acid (Condac Porcelana FGM) on the internal surfaces for 20 seconds, followed by washing, drying, and application of a silane coupling agent (Prosil FGM) for 1 minute. An adhesive agent (Single Bond Universal 3M ESPE) was applied according to the manufacturer's instructions.

The teeth underwent prophylaxis and modified isolation of the operative field. The enamel was etched with 37% phosphoric acid for 30 seconds, followed by washing. The adhesive agent (Single Bond Universal 3M ESPE) was applied according to the manufacturer's instructions. The laminates were cemented with NX3 Light-cure Clear cement (KERR), applied on the internal surface of the laminates, starting with the central incisors, always observing the correct adaptation and positioning of the laminates and protecting the adjacent teeth with Teflon strip. The proximal excesses were removed with the aid of dental floss; the labial and palatal excess were removed with microbrush and explorer #5, following by photopolymerization. After cementation, the occlusal contacts were checked. The final result is seen in figures 1 to 8.



Figure 1 - Initial aspect of the smile. The patient was dissatisfied with the size, color, and shape of the teeth. Note the disharmony of the gingival arch and absence of the lateral incisors



Figure 2A - Closer view. Unsatisfactory restorations attempting to reshape the canine teeth and close the diastemas impairing the periodontal health and gingival contour regularity



Figure 2B - Lateral closer view. Note the incorrect adaptation and contour in the closure of the diastemas, pushing and causing the papilla inflammation



Figure 3 - Closer view 3 months after healing and in-home whitening



Figure 4 - Waxing-up image



Figure 5 - Ceramic laminates with IPS emax press, shade BL4



Figure 6 – Central incisors after cementation



Figure 8 – Final smile aspect



Figures 7A e B – Final aspect of the restorations. Note the adequate adaptation and emergence profile

Discussion

To reach the dental esthetic excellence, different treatments or materials are available. However, regardless of the adopted treatment planning, caution should be taken to instruct the patient regarding all advantages and disadvantages of each treatment, and possible limitations, so that the patients' expectations are not frustrated because the treatment motivation is mainly due to unsatisfactory esthetics [9], resulting in great expectations.

The Periodontics is greatly allied with Operative Dentistry to obtain good outcomes because the gingival health and harmony are essential for the esthetic success. In the case reported here, the periodontal health was impaired by the presence of maladapted restorations that enabled biofilm accumulation and pushed the gingival papillae causing inflammation. The irregularity of gingival height caused disharmony. The periodontal treatment, the scaling, removal of the factors for bacterial plaque accumulation, and gingival recontouring favored esthetics, made the impression procedure easy, and enabled the construction of the ceramic laminates [5, 8, 10] with better adaptation and emergence profile improving the health and esthetics of the gingival papillae.

Other important factor was the possibility of not constructing provisional restorations because these may account for bacterial colonization and consequently periodontal tissue inflammation and esthetic alteration. When provisional crowns were

required, they must have good adaptation and polishing. The patient should be carefully instructed to perform oral hygiene, especially at the provisional crown stage [7, 10].

The need of esthetically rehabilitation of the smile requires many teeth to be restored, and in these situations, the ceramic laminates were an interesting option because of the indirect preparation, anatomic refining, and better adaptation of the proximal and cervical areas [11]. The dental ceramics increasingly evolved over the last years, which enables a significant improvement in the possibilities and indications of the indirect restorations, such as laminates, onlays, or full crowns, allying good resistance, color stability, and excellent optical properties [2]. The proved evolution of both the dentinal and cement adhesive systems, contributed for spreading the indirect techniques as safe and reliable at the long term [1, 13].

It is fundamental to highlight the importance of evaluating the patients' expectations and the understanding of the possible therapeutic solutions before starting any treatment planning [4]. A careful planning should capture the patients' need and report the different treatment possibilities, with the advantages and disadvantages.

Conclusion

The ceramic laminates have adequate physical properties, excellent esthetic, longevity, and enabled a conservative treatment when well indicated, especially when associated with periodontal treatment.

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