



Minimally Invasive Esthetic Rehabilitation. Different Therapeutic Options – A Case Report

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Abstract

The treatment of anterior teeth is always an added challenge because of the emotional and subjective aspects of the patient. Alignment, tooth bleaching and edge bonding with new highly polishable nano-hybrid composites and ceramics can make cosmetic dentistry far simpler and less invasive.

When we have dark endodontically treated teeth, fractured restorations, teeth in incorrect positions and fractured teeth, it is necessary to make a correct assessment of the case, to carry out the most appropriate treatment plan. The search for a perfect smile should not always lead to invasive solutions such as veneers or crowns since invasive treatments may have a negative impact on the long-term tooth biomechanical behavior and global treatment cost.

This article discusses the treatment rationale for the use of nonrestorative and additive procedures and their respective indications in a comprehensive approach to dental esthetics.

Keywords: *Esthetic Rehabilitation; Restorative Materials; Minimally Invasive Dentistry*

Introduction

In the last years, Dentistry has evolved a lot with the introduction of new adhesive techniques, innovative treatments and variety of dental materials available. Aesthetics and color of the teeth are reflection of systemic health. Several intrinsic and the extrinsic factors can influence tooth color, position and anatomy.

In permanent teeth with discoloration, the treatment options are bleaching, composite resin restorations, full crowns or veneers. The last two options are more invasive; however, with the emergence of adhesive techniques they are good options to consider. Intervention in these cases should always be with minimal destruction of tooth structure and should not compromise future restorative options.

Minimally invasive restorative techniques present a range of well-documented advantages over more tissue-destructive traditional restorations by minimizing unnecessary tooth tissue loss, aggression to the dentine-pulp complex and the reduction of the risk of iatrogenic damage to adjacent hard and soft tissues. They also maximize the strength of the residual tooth structure by us-

age of optimal adhesive restorative materials designed to restore function and aesthetics with durable, long-lasting restorations that are easy for the patient to maintain. Knowledge of the therapeutic indication of each technique, optical and resistance characteristics of the various materials available is essential.

Tooth bleaching is the most conservative treatment in the Aesthetic Dentistry, but it has its limitations. There are different bleaching techniques for vital and non-vital teeth.

Multiple restorative systems have been introduced over the past decades with considerable advances in material properties. These new materials, such as nano particle filled resins and ceramics allow us to have a more conservative approach and take into account the best clinical indication for each one. All of these materials increased the options and the clinical applications in Aesthetic Dentistry and Fixed Prosthodontics.

Purpose of this case

To demonstrate that anterior teeth rehabilitation can achieve very satisfactory aesthetic results and a balanced smile, consider-

ing a minimally invasive dentistry approach. This is possible due to new adhesion techniques and materials that are at our disposal.

Case Report

Female healthy patient, light smoker, presented with a fractured tooth (#23). She also complained about the appearance of her smile. An exhaustive clinical and radiographic evaluation was carried out: teeth #24, #11 and #14 had previous endodontic treatments, teeth #23 and #24 were fractured, teeth #21, #12, #13 and #22 had secondary carie lesions. Tooth #11 exhibited a heavy dark color and both #11 and #21 were rotated. #26, #46, #47 and #36 were missing. Finally, teeth #37, #35 and #27 had caries lesions.

Initial molds and photographic record were made and wax-up requested.



Figure 1: Initial intra-operative frontal photo.



Figure 2: Initial intra-operative lateral photos.



Figure 3: Teeth #11 and #12.

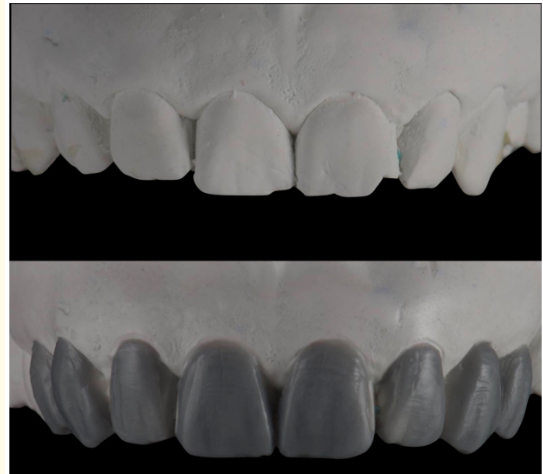


Figure 4: Wax Up.

Next appointment, an indirect mock-up was made.

Our initial treatment plan included: endodontic retreatment of #14, #11, #24 and endodontic treatment of #23 ; internal bleaching of non-vital teeth #11 and #14, and external intensive in-office bleaching of vital teeth. Two ceramic crowns on teeth #23 and #24, six ceramic veneers on teeth #22, #21, #11, #12, #13 and #14. Composite resin restorations of teeth with carious lesions and dental implants in edentulous spaces.



Figure 5: Replacement of old restorations with rubber dam.



Figure 6: First control after bleaching treatment.



Figure 9: Color selection with a personalized scale.



Figure 7: Intraoperative frontal photo result after bleaching techniques.



Figure 10: Veneers adhesion.



Figure 8: Intraoperative lateral photo result after bleaching techniques.



Figure 11: One month control.

After internal and external teeth bleaching, the color obtained allowed us to change the treatment plan in order to be even more conservative.

We chose to make aesthetic restorations with nano-hybrid composite resins on teeth #14, #13, #12 and #22 instead of veneers, a lithium disilicate overlay on tooth #24 instead of a full crown, a lithium disilicate full crown on tooth #23 and two feldspathic veneers on teeth #11 and #21.





Figure 12: Smile aspect after 1 month.

For monetary reasons, the patient stalled the implant rehabilitation.

Clinical, radiographic and photographic controls were performed at 1 months, 3 months, 6 months and 1 year.



Figure 13: Intraoperative photo control after 1 year.

Discussion

In this clinical case, good aesthetic results were obtained with both vital and non-vital bleaching techniques. However, after 1 year we can observe a slight relapse in the color of tooth #14. Composite resin restorations on teeth #14, #13, #12 and #22 using nano-hybrid resins have been shown to maintain color stability during the first year in a smoking patient but with a good oral hygiene. Composite resins restorations are a viable therapeutic option in case of teeth with secondary carie lesions and fractured restorations of small to medium dimensions. These teeth, which had initially been planned for a more invasive treatment with veneers, were rehabilitated using less invasive techniques [1-20].

Tooth #24 was rehabilitated with a lithium disilicate overlay when a full-crown tooth had been initially proposed. Tooth #23

was rehabilitated with a full-crown in lithium disilicate, also using adhesive techniques instead of retentive techniques that require greater enamel tooth removal.

In tooth #11, despite the color of the dentin substrate being extremely unfavorable, an excellent esthetic result was achieved with the adhesion of a feldspathic veneer instead of a full-crown. Also, the use of dental veneers allowed us to correct defects not only in the color, but also in the dental position of teeth #11 and #21, proving to be a viable therapeutic alternative to the use of an orthodontic approach.

Optical and mechanical characteristics of the used materials remained unchanged and the final result remained quite satisfactory after 1 year.

The major advantage of this approach is, not only, the tooth structure preservation, but also the significantly improvement of the appearance of tooth color, position and anatomy.

Conclusions

Minimally invasive dentistry is based on advances in science, techniques and materials.

The amount of tooth structure destroyed, location of the fracture and the severity of discoloration are considered while selecting a type of treatment, restorative material and tooth preparation.

In aesthetic rehabilitation a minimally invasive approach should be mandatory, in order to preserve substantial amount of tooth structure, preventing irreversible damage and an increase in cost for the patient.

The multidisciplinary evaluation of a case is imperative in Aesthetic and Conservative Rehabilitation. The choice of treatment depends on clinical experience and judgment taking into account the patient's circumstances.

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