

Minimally invasive dentistry: what is the limit ?

Technique for the treatment of white spots in young patients

Marcelo Alves & Camila Imperador Rodrigues Alves

ABSTRACT

The correct choice of treatment plan in young patients demands an accurate diagnosis, minimally invasive dentistry concepts and good communication with the patient and their guardians. This paper proposes an example of a detailed approach for attaining appropriate results for the patient's profile and age.

Descriptors: White spots; treatment; composites.

INTRODUCTION

Over the last few years, aesthetic dentistry has presented innumerable techniques related to the creation of harmonic smiles. The fact is that this subjective harmony is the result of therapeutic alternatives that can be invasive even if considered reversible.¹ Another route involves minimally invasive solutions that produce immediate results, but that can regress over time due to the failure to entirely remove the damaged tissues.²

The creation of the treatment plan includes a good clinical and radiological diagnosis, analysis of the patient's expectations, age and clinical follow-up. In the case of young patients, the concern about the correct amount of tissue removal required frequently leads to wrong decisions and to adopt inadequate treatments that may result in failure in the future

On the other hand, the Dental Surgeon's professionalism is based on preserving the dental tissue at all costs. It is essential to clearly identify the entire extension of the lesion in order to remove it completely and safely without damaging the healthy enamel and dentine.

Enamel hypoplasia and fluorosis generate important aesthetic challenges in young patients. Young patients, in a society where image is important, can develop a loss of self-esteem when they do not correspond to the pre-established aesthetic standards.³

The small white spots may be incipient, practically imperceptible or apparent. Dental whitening in many cases increases the possibility of perception of these lesions, generating the need for rehabilitation.⁴

The use of dental whitening on young patients is still discussed within the scientific community due to the high permeability of the dentine and the volume of pulp tissue mainly on the front teeth, which may generate undesirable collateral effects. For cases in which whitening is required on younger individuals, the employed technique was developed by Haywood and Haymann with the indication of using 10% carbamide peroxide for 14 days applied overnight with periodical control conducted by the professional responsible for the patient.^{5,6}

It is important to point out that the quality of the information provided to the patient, in these cases, prior to the beginning of the procedure, is fundamental to maintaining the credibility of the patient/dentist relationship. The appearance of lesions during this period may generate doubts in relation to the treatment by the patient. Good communication prior to commencing this treatment ensures that the patient is aware that an initial worsening is expected increases the potential for collaboration and participation by the patient as well as helps to control his/her expectations

Micro abrasion may remove the hypoplasticity, depending on its depth. This diagnosis can be made by means of trans illumination using a photo polymerizer or white LEDs, specially designed for diagnosis. For cases that do not allow the passage of light due to the low translucency of the damaged enamel, the image of the lesion obtained using this technique is darker, requiring the selective removal of the opaque tissue.

In order to achieve the objective of preserving the healthy enamel, the use of high-speed cutting diamond pointed burs is not recommended since the coolant water stream may mask these lesions, making it difficult to correctly identify the extent of the lesions. The use of micro-processed electric rotation instruments equipped with multi laminated burs or preparation techniques that use ultrasound facilitate the process. Enamel lesions are much more obvious when the enamel is dehydrated, requiring constant checking with the use of a jet of air for their correct identification, whilst using transillumination.⁷

The indicated adhesive technique is that of total etch, since the margins will certainly be composed of a greater percentage of enamel, less susceptible to the auto-conditioning techniques of self-etching

adhesive systems. The professional must be certain of the quality of the margins of the preparation, to ensure that non-affected tissue is not removed. After use of the phosphoric acid for conditioning, the enamel may also present a more opaque characteristic due to the loss of its characteristic luster; therefore, accuracy of margin placement is paramount.

The selection of the resin composite to be used also depends on the knowledge of its properties. Each commercial brand has its own characteristics, which leads us to select the composite based on its optical properties in cases of reduced thickness. Certain commercial brands have presented a system based on different tonalities of dentine and enamel that are not part of the vita scale. This trend has increased throughout the global market. In the clinical case to be presented, the system (Aura, SDI, Australia) presents Nano hybrid resins for the dentine, while the enamel resins are composed of prepolymerized micro particles that, according to the manufacturer, increase their resistance. The micro particulate resins are known for their high degree of polish.

During the restoration process, in this type of case in which a larger quantity of elements to be restored is involved, hydration of the enamel is an important factor in order to not have a false impression of the remaining lesions. In order to avoid desiccation, the restorations were performed individually and the prepared teeth were covered with humidified cotton in order to maintain the optical characteristics. Since they are incipient restorations made with microfill enamel resin, the polishing process is simple, using an abrasive disc or rubber system.

CASE REPORT

15 year old female patient presented with hypoplastic enamel lesions on various upper front teeth. After thorough diagnosis and discussion with the patient's parents, a restoration treatment was conducted using resin composite preceded by home-based dental whitening assisted by the dentist. The technique is described in sequence.



Fig 1 Fifteen year old female presenting with compromised aesthetics due to incisor hypomineralisation affecting many upper anterior teeth.



Fig 5 Close-up image after dental whitening.



Fig 9 Following removal of the affected tooth tissue showing the depth of preparation.



Fig 2 Initial detailed intraoral image. Note the incisor hypomineralisation with the patient in edge-to-edge relationship.



Fig 6 Trans illumination to identify the extent of the lesions (Radii plus, Diagnostic tip, SDI, Australia).



Fig 10 Shade selection.



Fig 3 During whitening, on the seventh day, the enamel lesions appear more obvious.



Fig 7 Detailed aspect of each tooth after dental whitening.



Fig 11 Aura enamel shades.



Fig 4 Close-up image before dental whitening.



Fig 8 Following removal of the affected tooth tissue from the labial.



Fig 12 Aura has excellent handling viscosity.



Fig 13 Dentine shades (of resin composite) (aura, SDI, Australia).



Fig 16 Insertion of dentine composite for Db whitened teeth.



Fig 19 Completed restorations following polishing.



Fig 14 Acid etch for total etch technique.



Fig 17 Insertion of E1 enamel composite.



Fig 20 Close up of completed technique.



Fig 15 Adhesive application – total etch system.



Fig 18 Application of humid cotton to maintain hydration of the enamel in order to avoid optical confusion.



Fig 21 Completed technique. Note the excellent aesthetics with natural translucency of Incisal edges.

References:

- Muñoz MA, Arana-Gordillo LA, Gomes GM, Gomes OM, Bombardía NHC, Reis A, Loguercio AD. Alternative Esthetic management of Fluorosis and Hypoplasia Stains: Blending Effect obtained with resin infiltration technics. J Esthet Restor Dent 2013;25:32-39
- Yildiz G, Celik EU. A minimally invasive technique for the management of severely fluorosed teeth: A two-year follow-up. Eur J Dent 2013;7:504-8
- Tong LSM, Pang MKM, Mok NYC, King NM, Wei SHY. The effects of etching, micro-abrasion and bleaching on surface enamel. J Dent Res 1993 Jan;72(1):67-71
- Alves M, Junqueira A. Técnica de clareamento associado em paciente com pigmentações intrínsecas. Odonto Magazine 2013; Janeiro: 50-53
- Haywood VB, Heymann HO. Nightguard vital bleaching: how safe is it? Quintessence Int. 1991 Jul;22(7):515-23
- Joiner A. The bleaching of teeth: A review of the literature. Journal of Dentistry 34 (2006):412-419
- Alves M, Junqueira A, Rehder Neto FC. Tratamento de manchas brancas: Diagnóstico e tecnologia associados ao planejamento estético. Revista APCD de estética 2013;01(2):160-71

