

## Case Report

**Whitening non vital teeth – a case report**IREN MORARU<sup>(1)</sup>, MIHAELA ȚUCULINĂ<sup>(1)</sup>, MARILENA BĂȚĂIOSU<sup>(2)</sup>,  
LELIA GHEORGHÎĂ<sup>(3)</sup>, OANA DIACONU<sup>(3)</sup>*(1) Department of Odontotherapy, (2) Department of Pediatric Dentistry, (3) Department of Endodontics, Faculty of Dental Medicine, University of Medicine and Pharmacy of Craiova*

**ABSTRACT** Commonly used in cosmetic dentistry teeth whitening can be used combined with other restorative techniques during dental treatment. Non-vital teeth whitening is necessary whenever we need an improvement of their aspect, as it's a known fact that these teeth can have a grey or pink-grey coloration when they are not correctly endodontically treated.

**KEYWORDS** teeth whitening, non-vital teeth

**Introduction**

To have white healthy teeth has been a wish often quite hard to accomplish, although represents a human concern since antiquity. Modern society has increased the importance of individual aspect, as shown by fashion, cosmetics, body esthetics and dental esthetics in particular.

Dental cosmetics is addressed to all patients that are preoccupied by their smile, being most frequently an option for the the young patients that suffered various accidents or those who, for different reasons (malnutrition, various illnesses, poor hygiene during childhood and adolescence) have their teeth very much affected by the dental caries, and mostly by its complications considering pulpectomy and even teeth extraction.[1,2]

An increased intake of coffee, cigarettes, soft drinks with artificial colorants associated to all the problems listed above have a disastrous esthetic result, the teeth getting a darker color and the smile and the general aspect of the patient gets very bad.

Treating these colored teeth requires a bleaching process on the teeth and eventually a partial or total cover of the dental crowns.

The bleaching process improves the dental aspect and the crowns would improve the esthetics of the overall mouth aspect.

Frequently used for the dental bleaching process are the following substances: hydrogen peroxide, carbamide peroxide, sodium perborate[2, 3]

No matter which whitening technique we use or the bleaching substance that is being used, the way of action is the same, as an oxidation reaction, having as result the release of oxygen molecules.[4]

**Material and method**

For whitening non vital teeth the bleaching agent is applied on the enamel surface (external whitening) as well as inside the pulp chamber (internal bleaching).

The external whitening technique for the non vital teeth is based on the fact that the bleaching agent is penetrating the enamel cells, reaching the dentine where is affecting the colored organic molecules.

The internal bleaching procedure of the non vital teeth is based on the fact that the bleaching agent reaches the dentine faster, directly inside the pulp chamber, and so it reaches the colored molecules faster, degrading them. [5]

The higher the concentration of the bleaching substances is the higher is the rate of the oxygen molecules release is and the time of action is shorter. This is the reason we choused for the presented case a product based on hydrogen peroxide 38% (Opalescence XtraBoost, Ultradent). The whitening technique used is "paint-on", which means individual applications of the whitening gel, on each tooth.

Patient F.R, age 19 presented herself in the dental office, being unhappy of the aspect of her upper front teeth. The patients was avoiding smiling, while speaking had a very small mouth opening, and was always paying very much attention on how much of her teeth was showing.

The medical interrogatory revealed the fact the patient had several interventions on her upper front teeth for treating many carious lesions occurred at this level. The clinical exam showed the existence of several composite obturations, on the teeth 12, 21, 22. These teeth had a yellow-grey coloration, characteristic for the non vital teeth , but also a pink- yellow coloration, due to the endomethasone used for the endodontic treatment, these teeth, 12, 21, 22 were investigated with x-

rays, noticing the existence of correct root canal obturations.

The coronal obturations had an incorrect marginal adaptation, with a brown-grey color on the edges. The effect was highly inesthetic, considering the size of the obturation going over the vestibular side of the teeth.

*The working technique.* During the first session we cleaned all the teeth with ultrasonic device and professional brushing, in order to remove all stains and coloration on the dental surfaces. (Fig.1)



**Fig. 1** The initial situation, after the cleaning procedures

During the second session we made an external bleaching. The hydrogen peroxide is very caustic for the soft tissues of the oral cavity, needing a very well done isolation of the teeth when we apply the gel. The opalescence XtraBoost kit contains a syringe with a special resin which we applied over the soft tissues around the cervical areas of the teeth, and we cured it with the curing lamp.



**Fig.2** Isolating the teeth

This resin will protect the gums from the irritative action of the peroxide. Additionally,

cotton rolls have been used and plastic retractors in order to protect the cheeks and the lips of the patient.(Fig. 2). The whitening gel as applied after we isolated all the teeth completely and correctly. (Fig. 3). The action time necessary for the gel is, according to the producer indications, 1-15 minutes, and after this time the excess was removed with cotton pellets and washed thoroughly.



**Fig. 3** Applying the whitening gel

After we isolated the teeth again the whitening gel was applied on the external surfaces of the teeth as well as inside the pulp chamber



**Fig. 4** Removal of the coronal restorations

During the third session we removed the coronal obturations (Fig. 4). Even if we noticed on the x-ray a nice and clean root canal filling that was previously made we had to be sure the root canal was perfectly sealed. The lack of perfect root canal sealing there is a risk of infiltration of the whitening gel towards apical area having as consequence the occurrence of irritation and necrosis in the alveolar bone. We removed 2 mm from the coronal section of the root canal filling

and replaced it with ionomer cement. We also made sure all the former coronal restoration has been removed (Fig. 5).



**Fig. 5 Removal of the obturation materials from the root canal, partially**

After the procedure the gel was completely removed and we closed the pulp chamber with a cotton pellet and provisional cement.



**Fig. 6 Final image after the whitening treatment and the new crown restorations**

Same steps were followed during the next sessions. To prevent external bone recession we applied inside the pulp chamber a calcium hydroxide, which has the role to penetrate the dentinal tubes all the way to the superficial layers.

## Results and discussion

A total of 5 sessions were needed to obtain a whitening on the 12, 21, 22 teeth and to obtain a similar color as the other teeth.

The final crown restorations were made 2 weeks after the final bleaching sessions. We used an international color key, VITA, and the chosen

color for this case was A2. As was proved during the working technique the whitening process of the teeth is not invasive. Although several sessions are required the results are very impressive most of the time.

Teeth bleaching is harmless process but there are some conditions that have to be respected: correct and complete soft tissue isolation (gums, lips, cheeks), in order to protect them of eventual burns caused by the peroxide, and, for the non vital teeth, to apply at the end of the whitening process calcium hydroxide inside the pulp chamber to prevent external resorbation. [6, 7, 8]

This clinical case could have been solved as well by using veneers or porcelain crown. But we considered the young age of the patient and the conservation of the hard dental tissues as much as possible, and so bleaching and composite restorations were the best option.

After the bleaching process inside the teeth there is quite a lot of oxygen. The oxygen affects the adhesion power of the bonding and composite, which why we waited 2 weeks until the final restorations were made. [1, 9]

## Conclusions

Using the teeth whitening technique together with the coronal esthetic restorations we avoided a great disruption of hard dental tissues, which would have been made during a prosthetic treatment.

Because we treated non vital teeth we have been able to use a bleaching agent with a high concentration, 38%, therefore a positive result was obtained in a shorter time.

Respecting the producer indications and the working technique for the on vital teeth we consider that we avoided the apparition of immediate complications as well as long term complications, with an esthetic great result.

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*Correspondence Address: Iren Moraru, Teaching Assistant, Department of Odonto-therapy, University of Medicine and Pharmacy of Craiova, Str Petru Rares nr. 4, 200456, Craiova, Dolj, Romania, email: med73danam@yahoo.com*