Professional in-office whitening of non-vital teeth

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Fig. 1_Pre-treatment, case I.
Fig. 2_Post-treatment, case I.
Fig. 3_Pre-treatment, case II.
Fig. 4_Drawing of the lingual entry of the cavity.

Fig. 1

Fig. 2

Fig. 3

_A dazzling white smile has been a symbol of beauty, health and vitality for hundreds of years. Discolouration, especially when the front teeth are affected, means a significant disturbance of aesthetics and can decrease a patient's self esteem. SDI's latest in-office tooth-whitening product, Pola Office+, is one of the fastest systems on the market. Its powerful hydrogen-peroxide-based gel and ease of use characteristics along with the clinical procedure for whitening of non-vital teeth and the beautiful results of this minimally invasive technique are described in this article (cases I & II).

Deep discoloration of non-vital teeth can be due to intrapulpal haemorrhage after trauma. Brown stains, for example, can be the result of Fe^{+2} ions reacting with hydrogen sulphide. Additionally, some endodontic filling materials can cause orange-red discolouration and grey-black staining is known to be caused by the corrosion of silver posts. Possible treatment options are discussed below.

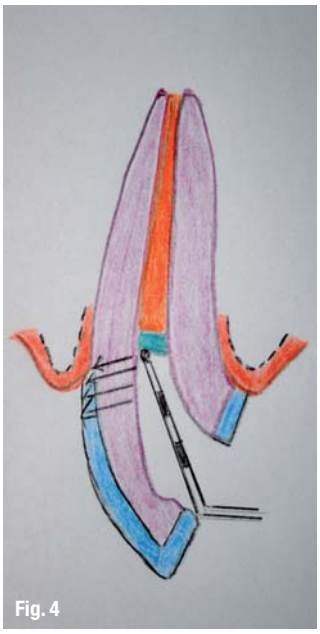
Fig. 4

Thermo-catalyst bleaching method

The bleaching gel is placed into the pulp chamber followed by application of a heating source such as a specially designed heating lamp or by using hot instruments directly in the pulp chamber or on the lingual–buccal surface of the tooth. The gel is repeatedly applied and heated. An uncontrolled rise in temperature bears the risk of unwanted side effects such as cervical resorption. Therefore, this method is no longer in practice.

Walking bleach technique

The root filling is removed approximately 2 mm under the dentine–cement line and the bleaching mixture is placed in the pulp chamber, sealed and left *in situ* for several days. A fresh peroxide mixture then replaces the previous mixture in the chamber and the chamber is resealed. This is repeated until the desired result is obtained. This technique is widely accepted and delivers good results.

Modern in-office tooth whitening technique

In case I (Figs. 1 & 2), Pola Office+ was used as in-office bleach. The gel was placed into the chamber and onto the surface of the tooth for the recommended time. The gel was then removed and fresh gel re-applied. This step was repeated several times. Please note: The bleaching gel does not stay in the tooth for several days as is done with the walking bleach technique. The clinical advantages of this technique are discussed in detail below.

_Preparation and lingual entry of the cavity

The following are the contra-indications for internal tooth whitening:

_apical periodontitis;
_apical resorption;
_insufficient root fillings; and
_insufficient fillings.

Owing to the functioning root canals, the risk of periapical lesions can be minimised. An X-ray can show whether old root fillings need to be redone. Amalgam fillings and silver posts need to be removed because they will quickly re-stain the bleached tooth owing to leakage of silver ions.

In case II, the front teeth had been subjected to trauma (Fig. 3). Digital radiographic examination of tooth #11 indicated that internal bleaching could be carried out for this patient. Special attention was paid to the lingual entry of the cavity (Fig. 4). The lingual filling was removed with diamond drills. At the cemento-enamel junction, the entry to the root filling was carefully opened with a rose drill, while cleaning the incisal crown.

Healthy and hard tooth substance should be preserved, even if discoloured, to avoid weakening the tooth unnecessarily. The root filling should be removed approximately 2 to 3 mm under the cemento-enamel junction and it should be sealed with a thick layer of glass-ionomer cement (GIC). It is best to use a dual-curing GIC, mixed by hand and formed to a small ball, so it can be easily placed into the opened canal. The GIC is placed in an apical position to the clinical crown. The required depth of the internal entry can be measured and determined using a PA probe (Fig. 5) in the cavity and at the vestibular tooth surface.

_In-office bleaching

Pola Office+ is the advanced version of the well-known in-office tooth-whitening system, Pola Office, which has been used successfully for several years. Both whitening products contain desensitising agents, such as potassium nitrate, to reduce post-operative sensitivities in vital teeth. The dual-barrel syringe system of Pola Office+ (Fig. 6) always delivers a consistent mixture of freshly activated gel that can be easily applied with a fine applicator tip, even in hard-to-reach areas (Fig. 7). Excess gel is removed with a cotton pellet. A thin layer of gel should be applied on the vestibular surface of the tooth. For cases I and II, the gel was left on the tooth for eight minutes and then removed using a surgical aspirator tip. There is no need to use a halogen lamp because the material is not heat activated.

The application steps can be repeated up to three times, so that the material is on the tooth for a maximum of four times for 8 minutes (32 minutes in total) in one session. The active ingredient of Pola Office+ is 37.5 % hydrogen peroxide and the gel rapidly releases peroxide ions upon contact with the tooth, enabling a shorter contact time compared with its competitors (Fig. 8).

Both cases were treated in just one session. After the whitening treatment, calcium-hydroxide cement was left in the cavity for several days. The tooth was restored with Ice nano-hybrid composite (SDI) after two weeks, using Bleach and A2 opaque shades.

_Result

With SDI's new in-office system, Pola Office+, patients can have whiter and brighter teeth in less than one hour. The easy-to-handle, dual barrel and auto-mixing syringe system is economical and optimises the workflow of the practice. In addition, the desensitising agents and neutral pH make Pola Office + the ideal tooth-whitening material for vital and non-vital teeth. Tooth whitening using minimally invasive techniques is enjoyable for the clinician and allows the patients to smile with confidence._

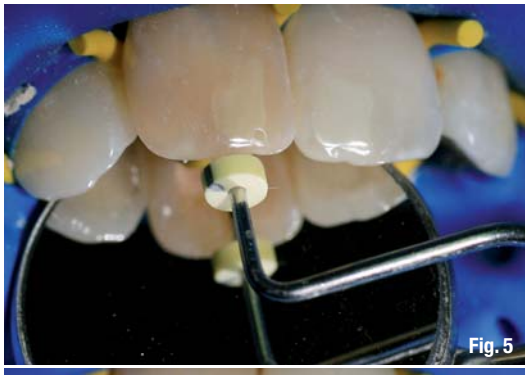
Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 5_Checking the depth of the cavity with a PA probe.
Fig. 6_Pola Office+.
Fig. 7_Application of gel using an auto-mixing tip.
Fig. 8_Post-treatment, case II.

_contact cosmetic dentistry

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