



AN OVERVIEW OF BLEACHING TECHNIQUES IN ENDODONTICS

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ABSTRACT

Nowadays, the most frequently requested procedure from the clinician is tooth/teeth whitening. Because patients are demanding whiter teeth more and more, a range of dentist-applied, at-home solutions, including dental pastes and gels, are available. These products also include a significant amount of bleaching chemical. A few documented risks associated with teeth whitening procedures include dental sensitivity, gingival irritation, demineralization of the tooth surface, and roughening of the tooth's surface layer.

KEYWORDS: Bleaching Techniques, Endodontics, Tooth

The expectation one has of oneself with regard to appearance and smile leads to self-awareness with relation to tooth discoloration. The market offers a variety of products, some of which involve the patient applying the bleaching agent at home and others that require the dentist applying the bleaching agent professionally (Viscio *et al.*, 2000).

CAUSES OF TOOTH DISCOLORATION

Discoloration can be attributed to two main causes: intrinsic factors or intrinsic stains, and external factors or extrinsic stains (Viscio *et al.*, 2000; Goldstein and Garber, 1995; Dodson and Bowles, 1991).

EXTRINSIC STAINS

Essentially, extrinsic stains are stains that are obtained from the external environment by certain chromogenic compounds that build up on the tooth's surface. Other factors contributing to the extrinsic stains included inadequate dental hygiene, the patient's inability to maintain good oral hygiene, personal habits such as tobacco chewing, which causes tobacco stains to accumulate on the tooth's surface, and consumption of chromogenic foods and beverages. The interaction between the sugar from meals or beverages and the amino acids in oral saliva causes these stains to become localized. Most of the time, these extrinsic stains are easily eliminated with standard preventative procedures. The persistence of these extrinsic stains increases if they are not eliminated at the first stage. The bleaching process has a significant impact on these extrinsic stains (Viscio *et al.*, 2000; Goldstein and Garber, 1995).

INTRINSIC STAINS

Enamel flaws are primarily to blame for intrinsic stains. They are primarily brought on by aging, micro cracks in the enamel's superficial surface, consumption of chromogenic foods or drinks, tetracycline ingestion, high fluoride intake, certain systemic issues like infantile jaundice, porphyria, and certain dental issues like dental caries, loosening restorations, and surface fractures. The most frequent cause of intrinsic stains is discovered to be aging because as people age, the dentine that lies beneath their enamel begins to darken as secondary dentine forms. The underlying color of the secondary dentine begins to show as the enamel thins with age, and secondary dentine is observed to be significantly darker. If drinking water contains a higher quantity of fluoride, this could cause metabolic changes in the ameloblast matrix and change the tooth's calcification process. Medications such as tetracycline, which are absorbed into the dentine matrix during the process of tooth calcification, can darken teeth. Regular preventive measures are not effective in removing intrinsic stains; instead, specialized chemicals that can pierce the enamel and dentine matrix are needed. (Nathoo, 1997; Feinman *et al.*, 1991; Rodrigues *et al.*, 2007; Kihn, 2007; Sulieman, 2005).

Composition of Bleaching Agents

As an active ingredient, they are mostly made of hydrogen peroxide or carbamide peroxide. A few more compounds include carboxy poly methylene, which serves as a thickening agent. Their concentration ranges from 0.5 percent to 1.5 percent when they are utilized. Its main purpose is to aid in raising the material's viscosity.

Other than this, carriers like glycerin or glycol propylene are utilized in bleaching agents because they

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give the agent the right amount of moisture. Gels containing surfactants have been demonstrated to be significantly more effective than those without surfactants. Enabling appropriate diffusion of the bleaching chemical is the primary purpose of surfactant. As a preservative, sodium benzoate or methyl propylparaben can be utilized. In essence, they prevent bacteria from growing in the bleaching chemical (Feinman *et al.*, 1991; Rodrigues *et al.*, 2007; Kihn, 2007; Sulieman, 2005).

Different Types of Bleaching Procedure

Broadly speaking, bleaching can be divided into two categories

(i) Vital tooth bleaching and the (ii) Non vital tooth bleaching.

VITAL TOOTH BLEACHING

Three distinct techniques fall under the category of important tooth whitening: (a) power bleaching, which is done in an office setting; (b) night guard bleaching, which is done at home; and (c) over-the-counter product bleaching.

In Office Bleaching

It makes use of extremely high hydrogen peroxide concentrations (between 25% and 40%). The dentist controls the entire process, and he or she has the authority to halt it once the tooth has reached the appropriate shade. First, a rubber dam or other material is applied to protect the soft tissue. Next, whitening gel is applied to the tooth surface, and the bleaching agent is activated by heat or light for a predetermined amount of time, as directed by the manufacturer. The bleaching agent can be activated using diode lasers, halogen curing light, or Xe halogen light. According to published research, in-office bleaching treatments can have effective results with just one use, but several visits are required to get the desired outcome (Sulieman, 2004; Leonard *et al.*, 2003; Haywood, 1992; Langsten *et al.*, 2002).

At Home Bleaching

It employs a small quantity of bleaching agent at strength of 10% to 20% carbamide peroxide, or 3.5% to 6.5% hydrogen peroxide. The patient does this operation on their own at home, but they still need to schedule routine follow-up appointments with the dentist. Using the bleaching agent, carbamide peroxide, at a concentration of 10% for eight hours a day or 15–20 percent for three to four hours a day is recommended for this approach. With this method, the patient wears a tailored night guard that contains whitening gel to apply

the bleaching chemical. The night guard must be worn for a minimum of two weeks at night. Certain dentists advise using a 35 percent hydrogen peroxide concentration in the office bleaching technique. This is followed by a home bleaching technique that uses a 15 or 20 percent carbamide peroxide concentration. They concluded that this process produces faster results. However, this quick method of teeth whitening also causes sensitivity to the teeth and inflammation of the gingiva (Kugel, 2003).

Over The Counter Products

They have become increasingly popular in recent years. They make up a relatively little percentage of bleaching agent, ranging from 3 to 6 percent hydrogen peroxide. The primary benefit of over-the-counter products is that they can be self-applied to the teeth surface using paint-on mechanisms or strips. They should be used twice a day for at least two weeks to get the best effects.

Non Vital Tooth Bleaching Technique

It consists of many bleaching methods, such as inside/outside bleaching, modified walking bleaching, and walking bleaching. Walking bleach works by filling the pulpal chamber with a solution of sodium perborate and distilled water. This process is repeated until the desired outcome is obtained. A variation of this method is also included, in which a pulpal chamber is filled with a solution of sodium perborate and hydrogen peroxide at a concentration of 30% for a week. The modified walking bleach treatment is the name given to this process. The internal non-vital power bleach method uses 30 to 35 percent hydrogen peroxide, which is placed in the pulp chamber and activated by light or temperatures between 50 and 60 degrees. This temperature is maintained for at least five minutes before the tooth is allowed to cool. After that, the gel applied in the pulpal chamber is removed, the tooth is dried, and ultimately, the walking bleach procedure is followed in between visits until the desired results are obtained with regard to the tooth. Finally, the inside/outside bleaching procedure combines at-home bleaching with internal bleaching of non-essential teeth (Setien *et al.*, 2008).

CONCLUSION

Nowadays, whitening teeth has been found to be an effective treatment option for removing tooth discoloration. However, the dentist needs to consider the long-term effects of teeth whitening. Therefore, in order to prevent any issues related to the teeth-whitening technique, a dentist should possess comprehensive understanding of the material to be utilized.

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