

How to prevent gingival irritation in in-office bleaching?

Abstract

Gingival irritation is one of the major side effects of tooth bleaching. That side effect is the major reason for patients' dissatisfaction with tooth bleaching. It is necessary for dentists to be acquainted with and prevent gingival irritation caused by in-office bleaching. Local administration of vitamin E to the gingiva before in-office bleaching may be useful for preventing gingival irritation due to accidental adhesion of the bleaching agent.

Keywords: side effects, gingival irritation, hydrogen peroxide, in-office bleaching, patients' satisfaction

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Introduction

Esthetics has become an important issue in modern society. The appearance and color of teeth are important to many individuals seeking dental treatment.¹ Many patients are now searching for personal satisfaction and there has been an increasing demand for an attractive smile. Tooth bleaching has become one of the most popular esthetic procedures offered in dental practice. Three bleaching approaches have been used: at-home bleaching, in-office bleaching, and the use of over-the-counter products.²⁻⁶ Some transient adverse effects on the oral mucosa and teeth such as tooth sensitivity, gingival irritation, dental erosion and dental abrasion have been reported.⁷ Most of the local effects are dependent on the technique of the operator and concentration of the bleaching agent.⁸ The major side effects of tooth bleaching are tooth sensitivity and gingival irritation.⁹ There have been numerous reports on tooth sensitivity as a side effect of bleaching.⁹⁻¹² The purpose of this mini review is to provide an outline of gingival irritation and show how gingival irritation can be prevented in in-office bleaching.

Side effects

Tooth bleaching has been described in the literature from as early as 1989.² Many of the early experiments were not very successful. The most effective methods involved the use of hydrogen peroxide.³ In-office bleaching is useful for removing stains by using a high concentration of hydrogen peroxide. The dentist is in complete control of the process throughout the treatment. Due to in-office bleaching treatment, several side effects such as enamel demineralization, micro-scale morphological defects and corrosion of restorative materials are often seen.^{13,14} Tooth sensitivity occurs due to the use of a high concentration of bleaching gel and application of the gel to the affected teeth.^{8,15} The bleaching gel sometimes accidentally comes into contact with the gingiva or oral mucosa around the treated teeth during the in-office bleaching procedure, even if the gingiva is protected with a rubber dam or a light cured gum protector.¹⁶⁻¹⁸ Tooth sensitivity can also be caused by unexpected movement of the patient during/after the in-office bleaching procedure. This phenomenon is called gingival irritation. Local inflammation occurs in gingival

tissues that are exposed to a high concentration of hydrogen peroxide, but that inflammation is easily treated. Gingival irritation occurs more frequently with in-office bleaching than with at-home bleaching.^{1,9}

Gingival irritation and patients' satisfaction

Patient satisfaction and gingival irritation are sometimes two sides of the same coin. Many patients have a positive thinking of painless treatment for in-office bleaching even if the patient has an aversion to general dental treatment. This seems to be because patients assume there will be no pain and they will have a feeling of distrust if there is pain during in-office bleaching. In fact, there have been some reports showing that the level of patients' satisfaction after bleaching is significantly higher in those without gingival irritation.^{4,9,15} Al Shethri reported that gingival irritation in patients who underwent in-office bleaching disappeared within 2 days.¹⁷ According to Bruzell's report, 14.3% of patients had gingival irritation due to in-office bleaching, and one patient complained of four side effects including gingival redness, tooth sensitivity, swelling of the lower lip and gingival irritation. Surprisingly, the same percentage (14.3%) of patients still complained of gingival pain three weeks after in-office bleaching.⁹ There are some patients who believe that "beauty is pain". In addition, satisfaction with tooth bleaching often inspires patients to have other teeth treated.

Prevention and treatment of gingival irritation

To prevent gingival irritation, a rubber dam, a light cured resin and baseline application are used in tooth bleaching in an office.^{16,17} If gingival irritation occurs despite preventative measures and the patient complains of pain, the operator usually stops the bleaching procedure or gives the patient a painkiller. In clinical practice, it is commonly believed that topical application of vitamin E cream on the gingiva contacts with an in-office bleaching agent and relieves the signs; however, there is no evidence to support this notion. Alpha-tocopherol (vitamin E) is an essential liposoluble vitamin that is not biosynthesized in the body and acts as an anti-oxidant. Vitamin E enhances cellular proliferation and wound healing, and it also suppresses the production of inducible nitric oxide synthase (iNOS) and thus provides protection against oxidative damage.^{19,20} Recent

studies have shown that cell membranes were repaired by adding vitamin E after stimulation with hydrogen peroxide.²¹ Hatipoglu et al. reported that injection of vitamin E into the gingiva decreased the number of iNOS-producing cells and might have reduced gingival inflammation in rats with periodontitis and with STZ-induced diabetes.²² We clarified that the cytotoxicity of hydrogen peroxide was significantly weakened by addition of vitamin E in human gingival fibroblast cultures.²³ Therefore, inflammation caused by gingival irritation may also be controlled by vitamin E.

Conclusion

Before starting an in-office bleaching procedure, the dentist must tell the patient about the possible side effects and must protect the gingiva by the use of a rubber dam or a light cured gum protector. If gingival irritation occurs, the dentist should immediately wash the gingiva with water. Local administration of vitamin E to the gingiva before in-office bleaching may be useful for preventing gingival irritation due to accidental adhesion of a bleaching agent. We hope that the application of vitamin E will become more popular in in-office bleaching in the near future.

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Conflict of interest

The author declares that there is no conflict of interest.

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