Conservative Dentistry Journal Vol. 12 No. 2 July-December 2022; 82-85

Case Report

In office dental bleaching with hydrogen peroxide: A case report

Nirawati Pribadi[1], Sylvia[2], Wulan Tri Maulinda[2], Anggi Wahyu Nur Cahyani[2]
[1]Departement of Conservative Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia
[2]Resident of Conservative Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Background: *Tooth discoloration has become an aesthetic issue that has a psychosocial impact on the majority of people. Dental bleaching is the most conservative preferred treatment for discolored teeth.* ***Purpose:*** *The aim of this case study is to report cases with in-office dental bleaching of maxillary and mandibular anterior teeth.* ***Case:*** *A 35-year-old woman complained about a yellowish tint on her upper jaw and front mandible, which made her feel self-conscious.* ***Case Management:*** *In-office dental bleaching performed using hydrogen peroxide and a desensitizing agent. Follow-up was taken, and the treatment results were satisfactory.* ***Conclusion:*** *In office dental bleaching is a treatment option to correct discolored teeth in a short time.*

Keywords: *tooth discolorations, esthetics, tooth-bleaching*

Correspondence: Nirawati Pribadi, Department of Conservative Dentistry, Faculty of Dental Medicine, Universitas Airlangga. Jl. Mayjen Prof. Dr. Moestopo no. 47, Surabaya 60132, Indonesia. E-mail: nirawati-p@fkg.unair.ac.id

INTRODUCTION

Tooth discoloration (dental discoloration) is frequently a cosmetic issue in patients, prompting them to seek treatment. Changes in the color of the teeth are subjective because the normal color of the teeth can appear abnormal to the patient. The first step is determining the patient's main complaint and the problem. There are various causes of tooth discoloration, such as consuming tea, coffee, smoking, and tooth discoloration due to pulpal trauma. Other causes of tooth discoloration are acquired tooth changes during the stages of tooth development, such as fluorosis, stain tetracycline, and amelogenesis imperfecta.[1]

Many methods can be used to treat tooth discoloration. Restorations such as crowns, veneers, and partial or total bleaching methods are often the treatment of choice.[2] The bleaching method is believed to be more conservative than the restorative method. The process is simple, minimally invasive, effective, and less expensive. Bleaching can be done internally (on the pulp chamber) or externally (on the enamel surface). The external bleaching method is divided into "power bleaching" (in-office) and at-home bleaching techniques. These two bleaching methods use different types and concentrations of bleaching agents.[3]

There are numerous bleaching materials available on the market today. Hydrogen peroxide (HP) and carbamide peroxide (CP) are commonly used materials. The oxidizing agent will diffuse and decompose to produce unstable free radicals. These free radicals react on organic pigment molecules, so they can reflect less light. This creates a "whitening effect".[4]

In-office bleaching is very suitable for patients without the motivation to do the treatment at home and for patients who prefer to go to the dentist. The results were almost the same between home bleaching and in-office bleaching.[5] The number of visits that had to be made for in-office bleaching treatments was also relatively low.

CASE

A 35-year-old woman came to RSKGMP Universitas Airlangga with complaints of yellowish discoloration of the upper and lower front teeth. The patient stated that she has regularly consumed tea every morning for the last 10 years. She feels less confident because the color of her teeth looks yellowish. The patient admitted that her teeth had never experienced spontaneous pain, hypersensitivity, traumatized, swollen, and had never been treated. The patient has no history of systemic diseases such as diabetes mellitus, cardiovascular disorders, and drug allergies.

CASE MANAGEMENT

On the patient's first visit, an amnesis, clinical examination, and salivary examination were done, and informed consent was acquired. Teeth 13, 12, 11, 21, 22, 23, 34, 33, 32, 31, 41, 42, 43, 44 were diagnosed as normal pulp. Treatment begins

with cleaning the tooth surface with a brush. Then, the initial color of the maxillary anterior teeth and mandibular teeth was determined using a shade guide, and the initial color of 4M2 was obtained (Figure 1). The entire surface of the lips is then smeared with lip balm.

The working area is isolated, while the tooth and gingiva are dried with a three-way syringe. Application of the gingival barrier gradually over the entire surface of the anterior gingival margin to the premolars on the maxilla and mandible was then light-cured (Figure 2). The bleaching agent is mixed according to the manufacturer's instructions (50 times). Apply the bleaching agent (40% hydrogen peroxide) to the teeth evenly using a micro brush on the labial surface of the teeth for 20 minutes (Figure 3). The bleaching material is leveled by rotating it using a micro brush every 5 minutes. The bleaching material is cleaned with cotton pellets, then rinsed with water accompanied by a suction tip (Figure 4).

Figure 1. Clinical photo pre-operative.

Figure 2. Aplication of the gingival barrier.

Figure 3. Aplication of the bleaching agent.

Figure 4. Cleaning bleaching agent.

Figure 5. Evaluation of in-office bleaching cycle 1.

Figure 6. Aplication of the bleaching agent cycle 2.

Figure 7. Evaluation of in-office bleaching cycle 2.

Figure 8. Evaluation of color before-after treatment.

Figure 9. Follow-up evaluation.

Tooth color was evaluated with a shade guide and was not on target so a second application of bleaching material was carried out (Figures 5 and 6). Check the color of the teeth with the shade guide, returning the color to 1M2 (Figures 7 and 8). Remove of the gingival barrier. Check whether there is a burn lesion on the gingiva. Application of desensitizing agent (contains 3% potassium nitrate and 0.11% fluoride). Then the patient was instructed to control 2 weeks. The next visit the patient stated that there were no complaints and the bleaching results were satisfactory (Figure 9).

DISCUSSION

Tooth discoloration is caused by the gradual thinning of the enamel. Thin enamel causes the dentin color to be more visible and more dominant in the tooth color.[4] Discoloration can be caused by intrinsic or extrinsic factors. Extrinsic factors such as those caused by plaque and chromogenic bacteria, long-term use of mouthwash such as chlorhexidine, the habit of consuming tea, coffee, cola, and colored foods, the consumption of antibiotics such as erythromycin and amoxicillin, and iron supplements. Intrinsic factors are divided into pre-eruptive and post-eruptive categories. Pre-eruptive is usually caused by several diseases, namely hematology, liver disease, and drugs like tetracycline and fluorosis. Post-eruptive factors such as trauma, caries, dental restoration materials, age, smoking habits, chemistry, and some colored foods and drinks.[6] The anamnesis obtained in this case stated that the patient had a habit of drinking tea every morning, which is one of the causes of discolored teeth.

Tooth discoloration can be treated with bleaching or restoration.[2] Teeth bleaching, such as in-office bleaching, is believed to be more conservative and effective. In-office bleaching indications include vital teeth with extrinsic stains from food and drink (tea). Not all cases of tooth discoloration can be treated with in-office bleaching, some are even contraindicated; such as the presence of hypersensitive dentin or carious lesions.[7]

In-office bleaching contains 25–40% hydrogen peroxide. This technique allows the dentist to control the bleaching procedure and stop the treatment if there is an uncomfortable response from the patient. In-office bleaching provides significant results even in just one treatment, but for optimum results, it can be done in more than one visit. In-office bleaching techniques should be combined with at-home bleaching techniques to provide maximum results.[8]

Types of bleaching agents are hydrogen peroxide, sodium perborate, and carbamide peroxide. In-office bleaching usually uses hydrogen peroxide alone or high concentrations of hydrogen peroxide mixed with sodium perborate, then applied internally or externally.[9] Carbamide peroxide is formed from hydrogen peroxide and urea. About one-third of carbamide peroxide is released as hydrogen peroxide. Hydrogen peroxide itself is rapidly decomposed by enzymes, particularly catalase and various peroxidases. Saliva containing catalase and peroxidase quickly breaks down the hydrogen peroxide released in the oral cavity during the bleaching process.[10]

The bleaching mechanism is related to the degradation of complex organic molecules with high molecular weights that reflect certain wavelengths of light. The resulting degradation products have lower molecular weights and consist of less complex molecules that reflect less light, thereby reducing or eliminating the discoloration.[11] Hydrogen peroxide has a low molecular weight, so it can penetrate the dentine and release oxygen, which breaks the double bonds of inorganic and organic compounds in the tubules so that the teeth can look brighter.[12]

Tooth sensitivity is a temporary side effect that often occurs after bleaching.[13] This can be prevented by applying materials such as fluoride, amorphous calcium phosphate (ACP), and desensitizing agents after the bleaching procedure. The use of these materials does not inhibit the effect of bleaching, and the microhardness of the enamel will return 14 days after in-office dental bleaching.[14,15] The conclusion that can be drawn from this case is that in-office dental bleaching can be a treatment option to correct discolored teeth. Besides being more conservative, this procedure can be done with one visit to the dentist.

REFERENCES

1. Mounika A, Mandava J, Roopesh B, Karri G. Clinical evaluation of color change and tooth sensitivity with in-office and home bleaching treatments. Indian J Dent Res. 2018 Jul-Aug;29(4):423-427.
2. Torabinejad M, Walton R, Fouad A. Endodontic Principle And Practice. 5 th ed. elsevier. saunders.2015
3. Greenwall L. Bleaching materials. Bleaching Techniques in Restorative Dentistry. 1st ed. London, United Kingdom: Thomson; 2001. p. 31-60
4. Linda G. Bleaching Technique in Restorative Dentistry. New York. United kingdom. 2001
5. Brtlett D, Ricket D. Advance Operative Dentistry. 1 st London. Elsevier. 2011
6. Cohen G, Linda. The Single Discoloured tooth: Vital And Non-Vital Bleaching Techniques. British Dental Journal.2019.V 226 no 11
7. Freedman G. Contemporary esthetic dentistry. St. Louis, Mo.: Mosby; 2012
8. Strassler HE. Vital tooth bleaching: An update. Cont Ed. 2006;1-12.

9. Martin K. Opertive Dentistry Dental Bleaching. London. British Library Catalouging. 2008
10. Alqahtani MQ. Tooth-bleaching procedures and their controversial effects: A literature review. Saudi Dent J. 2014;26(2):33-46.
11. Garg N, and Garg A. Textbook of endodontics. Estados Unidos: Jaypee Brothers Medical Publishers; 2019. P 472.
12. Gopikrishna V. Grossman's endodontic practice. 14th ed. India: Wolters Kluwer Health; 2021. P 458.
13. Féliz-Matos L, Hernández L, Abreu N. Dental Bleaching Techniques; Hydrogen-carbamide Peroxides and Light Sources for Activation, an Update. Mini Review Article. The Open Dentistry Journal. 2015;8(1):264-268.
14. Nanjundasetty J, Ashrafulla M. Efficacy of desensitizing agents on postoperative sensitivity following an in-office vital tooth bleaching: A randomized controlled clinical trial. Journal of Conservative Dentistry. 2016;19(3):207.
15. Kutuk Z, Ergin E, Cakir F, Gurgan S. Effects of in-office bleaching agent combined with different desensitizing agents on enamel. Journal of Applied Oral Science. 2018;27.