

Achieving Radiant Smile: A Case Report on In-Office Vital Teeth Bleaching

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Abstract- Vital tooth bleaching, a prevalent cosmetic dental procedure, significantly enhances smile aesthetics with minimal invasiveness. This technique effectively lightens natural tooth shade, boosting patient confidence without compromising tooth structure, unlike invasive alternatives such as veneers or crowns. Tailored by dental professionals, bleaching processes adjust bleaching agent concentrations to optimize results while mitigating sensitivity risks. Supervised by qualified practitioners, safety is ensured, contributing to long-lasting whitening effects, particularly with appropriate post-treatment care. Both in-office treatments and take-home kits provide convenient options for patients, enhancing accessibility. Vital tooth bleaching emerges as a cost-effective solution for patients seeking a brighter smile, encompassing aesthetic enhancement, customization, safety, durability, convenience, and affordability.

Keywords: Antivet, Microabrasion, Bleaching, Vital tooth.

INTRODUCTION:

For centuries, a bright smile has symbolized beauty, health, and vitality. Discoloration, particularly in the front teeth, significantly impacts aesthetics and can lower self-esteem. In recent years, there has been a notable increase in the demand for aesthetic dentistry, particularly tooth whitening. Compared to restorative methods, whitening, or bleaching, is the most conservative approach for addressing tooth discoloration. This surge in demand reflects the desire for a whiter smile and improved aesthetics, making tooth whitening a popular and frequently requested dental procedure. Additionally, tooth whitening often complements other aesthetic treatments, encouraging further enhancement. Dental bleaching provides a conservative, cost-effective means of altering tooth color, with techniques including in-office procedures, at-home applications, or a combination of both.¹

Dental fluorosis is a condition caused by prolonged exposure to fluoride, disrupting enamel growth and resulting in hypomineralization. This disorder affects tooth development and presents aesthetic concerns such as white spots, brown stains, or opaque lines on the tooth surface. While fluorosis is evenly distributed across teeth, its severity differs depending on the tooth type.²

Treatment options for dental fluorosis include microabrasion, bleaching, composite restoration, veneers, or full crowns, chosen based on individual cases. Enamel microabrasion is recommended for mild to moderate fluorosis stains, while moderate to severe cases may require a combination of microabrasion and bleaching. Severe fluorosis with significant enamel flaws may necessitate restorative procedures.³

Bleaching procedures come in two main types: non-vital for root canal-treated teeth and vital for those with live nerves. Vital bleaching involves applying a gel-like whitening solution, such as hydrogen peroxide, sodium perborate, or carbamide peroxide, directly onto the tooth surface, followed by heat activation.⁴ Oxidation of pigments is key to tooth bleaching, achievable through either carbamide peroxide or hydrogen peroxide. This in-office procedure, often termed "one-hour bleaching," employs high concentrations of hydrogen peroxide, typically ranging from 25% to 35%. Treatment duration can be as short as 1 to 1.5 hours in a single visit or through multiple sessions, tailored to individual patient needs.⁵

The objective of this case series is to elucidate and analyze instances of mild to severe dental fluorosis that underwent treatment utilizing Antivet applied over inactive brown patches on the upper anterior teeth via a chemical microabrasion method. The Antivet Kit serves as an effective solution for eradicating stains resulting from fluorosis, smoking, or consumption of dark sodas, wine, and coffee. Additionally, it is endorsed for use as a pre-orthodontic intervention to enhance bracket adhesion on teeth impacted by fluorosis.

Antivet includes a 10 ml bottle of enamel cleaning solution, a 10 ml bottle of neutralizing solution, rubber dam sheets, brush applicator tips, a solution palette, and detailed manufacturer instructions. It's designed as a one-session treatment for brown stain removal.

This case report demonstrates the significant improvement in tooth color achieved through in-office bleaching, highlighting its efficacy in enhancing dental aesthetics.

Case Report:

A 23-year-old female patient presented to the Department of Conservative Dentistry and Endodontics at Narsinhbhai Patel Dental College and Hospital, Visnagar, with concerns regarding the discoloration of her upper front teeth. Upon examination, no significant signs or symptoms were noted, and the patient's medical history was unremarkable. Clinical assessment revealed the presence of dark brown stains on the facial surfaces of the maxillary central and lateral incisors (Figure 1). These stains were classified as moderate to severe fluorosis based on Dean's fluorosis index.

Our goal was to enhance the patient's smile while prioritizing minimally invasive procedures, efficient treatment duration, and consideration of the patient's financial constraints. Consequently, we opted for microabrasion as the ultimate treatment choice. Initially, oral prophylaxis was conducted, after which tooth isolation was achieved using a rubber dam sheet.

In this case, we utilized the Antivet Solution kit, which is a commercially available dental enamel cleaning kit provided by MDC Dental, for the enamel microabrasion procedure.

The initial step involved applying a stabilized solution containing 21% hydrochloric acid onto the stains using a cotton pellet until a color change was observed in the pellet. To attain the desired outcome, three applications lasting 5 minutes each were administered. This solution penetrated the enamel, removing fluoride ions and reducing stains through mechanical rubbing and chemical action. Three 5-minute applications were performed, followed by a 2-minute application of a neutralizing solution to remove any remaining acid. After removing the rubber dam, teeth were polished with a composite polishing kit, resulting in the patient's satisfaction. Maintenance included two weeks use of an over-the-counter whitening toothpaste, with post-operative instructions given. No sensitivity or stain relapse occurred in the six-month follow-up.



Figure 1: Pre-Operative photograph showing brown stains



Figure 2: Post-Operative Photograph

DISCUSSION:

Bleaching is characterized as the process of diminishing the color intensity of a tooth by employing a chemical agent to induce oxidation of the organic pigments present within the tooth structure. The primary aim of a bleaching procedure is to reinstate the natural color of the tooth by eliminating discoloration through the utilization of a potent oxidizing substance referred to as a bleaching agent.⁶ The bleaching procedure is applicable to various conditions causing tooth discoloration, including pulp tissue decomposition, internal hemorrhage, trauma, medication-induced discoloration, and systemic conditions like fluorosis, jaundice, and fetal erythroblastosis. However, there are key contraindications, such as avoiding bleaching in pregnant women, infants, and children under 10 years old, as well as patients with exposed dentinal tubules or those unable to abstain from smoking during treatment. Irrespective of the specific bleaching technique or product used, the mechanism of action relies on the release of active oxygen species through the interaction of hydrogen peroxide with tooth structure. Hydrogen peroxide acts as an oxidizing agent,

generating free radicals and releasing oxygen. This process breaks down pigment molecules, particularly those absorbing the blue spectrum of light, into smaller, less pigmented compounds with free hydroxyl groups. Consequently, the reflected light comprises a mixture of blue, green, and red spectra, resulting in a whitening effect on the teeth.

Enamel microabrasion is considered effective for addressing external enamel stains, including those presenting as white, yellow, or brown discolorations. When managing fluorosis, it is imperative to accurately assess the severity of enamel staining. Utilizing acidic and/or abrasive substances during enamel microabrasion yields immediate and enduring improvements in aesthetics while minimizing enamel loss and post-operative discomfort. Successful outcomes hinge upon meticulous patient selection and proficient rubber dam isolation. In a study conducted by Sundfeld et al., a microabrasive product was incorporated to enhance stain removal and refine the enamel surface. The Prema Compound, manufactured by Premier Dental Products Co, Norristown, PA, USA, was chosen for its proven efficacy in enamel stain removal and surface irregularity smoothing. This product comprises 10% hydrochloric acid and silica carbide particles. Preceding application of a fine-tapered diamond bur facilitated the subsequent two to three applications of the microabrasive product, typically necessary for achieving desired aesthetic results.

Vital tooth bleaching, or teeth whitening, is a non-invasive cosmetic dental procedure with several benefits. It effectively lightens natural tooth shade, enhancing smile aesthetics and bolstering confidence. Unlike invasive options such as veneers or crowns, it preserves tooth structure, appealing to those seeking cosmetic enhancements without significant dental alterations. Customizable by professionals, it allows tailored adjustments of bleaching agents to achieve desired results while minimizing sensitivity. Supervised application ensures safety and enduring whitening effects, particularly with proper maintenance. Vital tooth bleaching offers convenience through in-office treatments or take-home kits, accommodating diverse patient preferences. Additionally, its affordability broadens accessibility, making it a popular choice for achieving a brighter smile, encompassing aesthetic improvement, customization, safety, longevity, convenience, and cost-effectiveness.⁸⁻¹⁰

CONCLUSION:

Vital tooth bleaching employing Antivet offers a promising therapeutic avenue for individuals pursuing efficacious and safe dental whitening interventions. Through methodical implementation and capitalization on Antivet's advantages, dental professionals can attain exemplary aesthetic results while upholding patient comfort and preserving dental vitality.

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