



Non-vital Tooth Bleaching in a root canal retreated tooth - A Case Report

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Abstract

A beautiful smile often starts with well-maintained white teeth. Tooth discoloration can occur for various reasons including extrinsic or intrinsic and understanding the underlying cause is key to determining the appropriate treatment. Non-vital tooth bleaching is a procedure used to lighten a tooth that has undergone a root canal treatment and has become discolored. Unlike vital bleaching, which is done on vital teeth, non-vital bleaching carried out in teeth that are no longer alive due to the removal of the nerve tissue. This case report describes a non-vital tooth bleaching in a discolored tooth and root canal retreatment showing good prognosis and high-quality esthetic results.

Keywords: Esthetics, In-office bleaching, Non-vital tooth, Retreatment, Root canal treatment.

Introduction

Young adults are increasingly seeking dental cosmetic treatments especially in tooth whitening procedures because of increased Awareness, aging population, social media influence and improved treatments [1,2]. Diagnosing the etiological factors for discoloration requires considering various possible causes based on the type of discoloration. Bleaching can be a great option for improving the appearance of teeth when there is mild to moderate discoloration, intact tooth structure, minimal invasive, quick chair side time and cost-effective. Conventionally, full coverage crowns were preferred for rehabilitate esthetics in endodontically treated anterior teeth [1].

Various reasons for tooth discoloration in endodontically treated tooth includes certain medications, such as tetracycline antibiotics, loss of blood supply, haemorrhage, residual endodontic materials, resorption of root, pulp necrosis, post-operative changes like fragmentation lead to small fractures or cracks in the tooth, composite or amalgam restorations, foods and beverages like coffee, tea, red wine, or tobacco can stain endodontically treated teeth, just as they can stain natural teeth [2,3]. Root canal procedure can sometimes lead to changes in the tooth's structure, leading to a darker appearance. This case report deals with non-vital tooth bleaching from root canal retreatment to restoration showing good prognosis and high-quality esthetic results.

Case Report

A 25-year-old female patient reported to the Private dental clinic with chief complaint of discolored upper right anterior tooth. Patient had a history of trauma with anterior teeth 6 years back and she had undergone root canal treatment for the same. Intraoral examination revealed brownish discolored maxillary right central incisor (Figure 1). An intraoral radiograph showed obturation which is beyond the apex and disturbed periapical tissue with respect to the same tooth (Figure 2), Patient was explained about the failed root canal treatment and retreatment was advised by taking informed consent. Preoperative shade of the tooth was determined by Vita classic shade guide under normal daylight. Retreatment was completed. Before the application of bleaching agent, the pulp chamber was cleared by removing 2 mm of gutta-

percha near orifice and placing a base of 1 to 2 mm glass ionomer cement (GIC) over the gutta-percha to create a mechanical barrier between the sealed root canal and bleaching agent to be used in pulp chamber (Figure 3). Nonvital bleaching with a mixture of sodium perborate and 3% hydrogen peroxide [sodium perborate and 3% H₂O₂ in ratio of 2:1 (gm/mL)] was decided for this patient and bleaching procedure was performed. After placement, the cavity was sealed with temporary restorative material and the patient was recalled every week for repeating the bleaching procedure so as to obtain the desired results. Before proceeding ahead, in each visit, the result was clinically evaluated comparing the teeth shade with the previous one using Vita shade guide and photographs were taken. After a few visits, the shade of the teeth gets lightened to a superior esthetic shade with accepted clinical success; thereafter, the tooth was permanently restored using composite resin. The tooth showed significant improvement in shade after 3 visits (Figure 4).



Figure 1: Pre-operative photograph showing discolored maxillary right central incisor

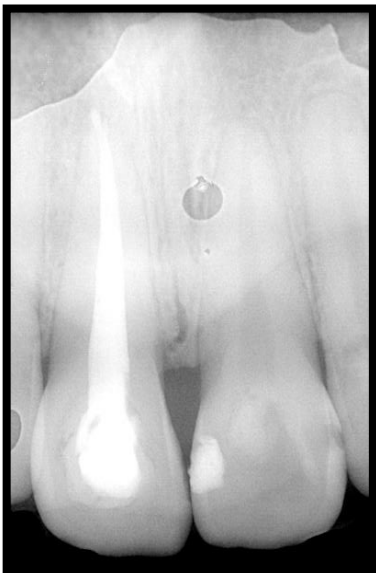


Figure 2: Pre-operative radiograph showing gutta percha going beyond the apex



Figure 3: Placement of barrier with Glass Ionomer Cement



Figure 4: Post operative photograph following non-vital tooth bleaching

Discussion

Pulpal necrosis refers to the death of the dental pulp, which is the innermost part of a tooth containing nerves, blood vessels, and connective tissue. When the pulp becomes necrotic, it no longer functions properly, leading to the loss of sensation in the tooth resulting in dentin discoloration. Dyschromia in tooth structure refers to discoloration or abnormal coloration of the teeth, often as a result of underlying changes within the tooth itself [3].

Bleaching in a pulpless tooth is a cosmetic procedure using sodium perborate mixed with hydrogen peroxide or saline to address discoloration that often occurs after the tooth loses vitality. This type of discoloration is intrinsic, meaning it comes from within the tooth, and typically requires a different approach compared to bleaching vital teeth. Tooth bleaching involves the use of chemical agents that penetrate the enamel and dentin of the tooth to break down stains and discoloration. The process relies on oxidative reactions to alter the color of chromogenic compounds (pigments or stains) within the tooth structure. The key bleaching agents are typically hydrogen peroxide (H_2O_2) or carbamide peroxide ($CH_6N_2O_3$), which break down into hydrogen peroxide and urea [3-5].

Oral prophylaxis should be done to remove plaque and tartar. Etiology of the stains should be determined whether it is extrinsic or intrinsic stain. After removing plaque and tartar, the teeth are polished using a rotating brush and a mildly abrasive paste (prophy paste). This polishing process helps to remove surface stains caused by coffee, tea, red wine, and smoking. Photography is necessary for performing tooth bleaching, it is a valuable tool in documenting and enhancing the effectiveness of the treatment because it helps in baseline documentation, reference for comparison, progress tracking, visual feedback, shade selection, patient communication, motivation and satisfaction, legal and professional documentation, marketing and case studies [7].

A radiological examination is an important step to evaluate the quality and completeness of the treatment, incomplete filling, missed canals, or overextension of the root canal filling material that could affect the integrity of the tooth. Before performing bleaching, it is wise to confirm that there are no ongoing infections. It can also identify any periapical pathology, such as an abscess or cyst at the root tip. A pulpless tooth may develop these issues if bacteria persist in the root canal system. Bleaching should not be performed if there is active infection, as the underlying problem must be addressed first, often through retreatment or additional dental interventions [8].

Assessment of tooth structure integrity, evaluation of restorative work will show any existing restorations (such as fillings or crowns) in or near the tooth. Some materials may need to be replaced after bleaching, as they do not lighten like natural tooth structures. X-rays can detect internal or external root resorption. Post-Radiological Assessment should also be done once the radiological examination confirms that the tooth is free from infection, resorption, or other complications, and that the root canal treatment is intact, the tooth may be deemed suitable for internal bleaching or other whitening procedures. If any issues are detected, they must be treated before cosmetic procedures can proceed [1-6].

Conclusion

From this case presentation it can be concluded that careful management of failed root canal treatment is very important by utilizing appropriate preoperative radiographs and also to provide better satisfactory esthetic results to the patient.

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