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Management of a discoloured central incisor with partially obliterated canal

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# Abstract

Calcific metamorphosis or pulp canal obliteration (PCO) is the pulpal response to trauma, characterized by rapid deposition of mineralized tissue in the root canal space. Proper debridement, disinfection and obturation of root canal is difficult in such cases thus compromising root canal treatment. This is a case report that aims to depict the conservative management of a discoloured maxillary central incisors with partially obliterated canal.

**Keywords:** Pulp Canal Obliteration, Sodium Perborate, Obturation, Bleeching, Walking Bleach Technique.

## Introduction

Calcific metamorphosis or pulp canal obliteration (PCO) is the pulpal response to trauma, characterized by rapid deposition of mineralized tissue in the root canal space.(1) The discoloration of the tooth that results from dental trauma, carious lesions, abfraction, abrasion, pulp capping, occlusal imbalance, orthodontic treatment can lead to the loss of vitality of the teeth. Normally PCO has no general symptoms and mostly notes because of a tooth discoloration or a routine radiographic examination. Digital radiographs of good quality, with

the possibility of expansion and the use of different contrasts, are important to initiate the identification process. The combination of dental operating microscopy (DOM) and ultrasonic tips (US) may help in identifying obliterated canals. However, in some situations, despite all of these resources and the skills and expertise of the operator, cone-beam computed tomography (CBCT) is necessary and allows three dimensional images without overlapping adjacent structures, which facilitates the identification of the canals, their directions, degrees of obstruction and dimensions.(2)(1)Over the years, a number of bleaching and restorative techniques have been proposed for managing discoloured nonvital incisors(3). Walking bleach technique is based on the use of chemicals that release active oxygen such as hydrogen peroxide (H2O2) or sodium perborate (SP). A combination of SP and water or H2O2 has been used in the "walking bleach" technique.(4)(5) The outcome of the bleaching depends mainly on the concentration of the bleaching agent, ability of the agent to reach the chromophore molecules, and duration and number of times the agent is in contact

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with chromophore molecules.(6) Although H2O2 exhibited excellent esthetic outcome, the undesirable consequences such as cervical resorption and irreversible damage to the dentin and surrounding tissues led the clinicians to look for alternative methods.(7) This is a case report which explains the management of a discoloured maxillary central incisor with partially obliterated pulp canal using sodium perborate.

#### **Case Report**

A 36-year-old female patient came to department of conservative dentistry and endodontics with a chief complaint of discoloration on her upper right front tooth since few years. She claimed that she had never experienced trauma. When asked about her dental history, she revealed that she had undergone orthodontic treatment few years ago. Her medical history was non contributary. On Intra oral examination a mild blackish discoloration was noticed in relation to maxillary left central incisor (Figure 1). The patient was asymptomatic with no tender on percussion and the probing depth was normal. Both electric pulp testing and cold test elicited a negative response. The radiographic examination revealed a sound tooth structure with partially obliterated root canal with no abnormality on the periapex (Figure 2). So, a diagnosis of pulp necrosis with asymptomatic apical periodontist was made. A

treatment plan of root canal therapy followed by intracoronal bleaching using sodium perborate mixed with saline was proposed to the patient followed which informed consent was obtained. On the first visit an access opening was made using no 4 round bur and extended shank round bur under local anaesthesia and rubber dam isolation. Scouting of the root canal orifices was done using a DG 16 explorer and visualized under dental loupes. No. 6 ,8, 10 K file was used in watch winding motion with minimal vertical pressure and regularly replaced before signs of fatigue occurred along with usage of 17% EDTA to reach till the apex. Working length was measured using an electronic apex locator (Epex Pro, Eighteenth, Changzhou, China) and confirmed radiographically (Figure 3) .Initial instrumentation was done till 25 k file and a calcium hydroxide dressing was given . The access cavity was sealed with zinc oxide eugenol temporary filling material.

On the second visit after 10 days then biomechanical preparation was completed using Protaper Gold (Dentsply Maillefer, USA) till the size F3 with proper irrigation using normal saline after each instrumentation. The canal was dried using paper points and a corresponding gutta percha cone is used to check the fit and confirmed radiographically.(Figure 4) The canal is then obturated using F3 master cone coated with AH Plus sealer (Figure 5). The Gutta percha was removed 3-4 mm apically from the cementoenamel junction and an intermediate restoration with glass ionomer cement of thickness 2-3 mm was given in order to avoid any microleakage. The patient was the recalled after 2 days for the placement of intracanal bleaching material.

Sodium perborate was mixed with saline on a dappen dish in a granular consistency and placed into the access cavity. An applicator tip was used to compact the sodium perborate into the cavity which was sealed using glass ionomer cement. The patient was recalled after 1 week for review which showed an improved shade and the shade was matching more or less similar to the adjacent tooth. (Figure 7) The filling material is removed and the sodium perborate was removed from the cavity using saline irrigation followed which a permanent access restoration was given. The patient was recalled after 3 months for the evaluation of the shade stability (Figure 8) Dr. Adarsh S, et al. International Journal of Dental Science and Innovative Research (IJDSIR)

Discussion

Discoloration of the anterior tooth due to trauma or endodontic treatment can cause considerable esthetic compromise to patients. The management of postendodontic tooth discoloration includes full veneers, laminates, crowns, and non-invasive technique such as bleaching(6). Even though laminate veneer or a full porcelain crown is one of the most predictable methods of managing such cases, it involves the removal of tooth structure.(8)(9)Nonvital bleaching has many benefits since it is a non-invasive procedure, economical, and less time-consuming. The three most popular techniques for nonvital tooth bleaching are the walking bleach technique, inside/outside bleaching, and in-office bleaching. The walking bleach technique is a relatively reliable, fairly simple technique. The walking bleach technique is performed by application of a paste consisting of SP and distilled water or H2O2 in the pulp chamber. SP has been widely used to bleach nonvital teeth with predictable results.(3) SP is anoxidizing agent containing 95% perborate and is available in three forms: monohydrate, trihydrate, and tetrahydrate. In the presence of water, perborate will break down to form sodium metaborate, H2O2, and oxygen. SP is also synergistically used with H2O2but when used with water released H2O2in a controlled manner with remarkable esthetic outcome with little or no side effects.(10) The SP releases active oxygen radicals inside the pulp chamber and diffuses to the dentinal tubules.(11)It oxidizes and bleaches the iron sulphide and other pigments present in the dentinal tubules and the free radicals induces oxidative effects to lipids, proteins, and nucleic acids. Cervical root resorption is a potential complication of nonvital tooth bleaching. Studies have shown that the use of a mixture of SP and water showed low potential to cause cervical resorption.(12)(13) However, in the present case, the use of SP and water as well as proper sealing technique prevented the development of resorption. Rotstein et al. demonstrated that a 2mm layer of glass ionomer cement (GIC) was effective in preventing the diffusion of 30% hydrogen peroxide solution. (14)

#### Conclusion

The case presented highlights the effectiveness of the nonvital bleaching using SP and saline to achieve successful and predictable cosmetic outcome. However, 2mm protective base as a barrier must be placed to avoid the initiation of external cervical root resorption.

Hence, it can be concluded that walking bleaching technique using SP can be used as a treatment of choice for nonvital, discoloured endodontically treated cases.



Figure 1: Preoperative clinical image showing discoloration irt 21



Figure 2: IOPAR showing partially obliterated root canal irt 21.



Figure 3: Working length determination irt 21



Figure 4



Figure 5



Figure 6



Figure 7: Post operative image



Figure 8 : 3 months follow up **Reference** 

 De Toubes KMPS, de Oliveira PAD, Machado SN, Pelosi V, Nunes E, Silveira FF. Clinical approach to pulp canal obliteration: A case series. Iran Endod J . 2017 Sep 1

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## Dr. Adarsh S, et al. International Journal of Dental Science and Innovative Research (IJDSIR)

- McCabe PS, Dummer PMH. Pulp canal obliteration: an endodontic diagnosis and treatment challenge. Int Endod J . 2012 Feb 1
- Amato M, Serena Scaravilli M, Farella M, Riccitiello F. Bleaching teeth treated endodontically: long-term evaluation of a case series. J Endod. 2006 Apr;32(4):376–8.
- Camps J, de Franceschi H, Idir F, Roland C, About I. Time-course diffusion of hydrogen peroxide through human dentin: clinical significance for young tooth internal bleaching. J Endod . 2007 Apr
- Holmstrup G, Palm AM, Lambjerg-Hansen H. Bleaching of discoloured root-filled teeth. Endod Dent Traumatol . 1988
- Dahl JE, Pallesen U. Tooth bleaching--a critical review of the biological aspects. Crit Rev Oral Biol Med . 2003.
- Almohareb T. Management of discolored endodontically treated tooth using sodium perborate. J Int Oral Heal . 2017 May 1
- Clinical performance of porcelain laminate veneers for up to 20 years. J Prosthet Dent. 2012 Mar;107(3):157.
- Chen YW, Raigrodski AJ. A conservative approach for treating young adult patients with porcelain laminate veneers. J Esthet Restor Dent. 2008 Aug
- Valera MC, Ribeiro Camargo CH, Carvalho CAT, De Oliveira LD, Afonso Camargo SE, Rodrigues CM. Effectiveness of carbamide peroxide and sodium perborate in non-vital discolored teeth. J Appl Oral Sci. 2009
- Kawamoto K, Tsujimoto Y. Effects of the Hydroxyl Radical and Hydrogen Peroxide on Tooth Bleaching. J Endod. 2004 Jan 1;30(1):45–50.
- 12. Ari H, Üngör M. In vitro comparison of different types of sodium perborate used for intracoronal

bleaching of discoloured teeth. Int Endod J . 2002 May

- Seltzer S, Bender IB, Smith J, Freedman I, Nazimov H. Endodontic failures-An analysis based on clinical, roentgenographic, and histologic findings. Part I. Oral Surgery, Oral Med Oral Pathol. 1967
- 14. Rotstein I, Zyskind D, Lewinstein I, Bamberger N. Effect of different protective base materials on hydrogen peroxide leakage during intracoronal bleaching in vitro. J Endod. 1992