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Case Report

Endodontic management of discolored non vital tooth using walking bleach technique: Case Report

Neelam Mittal[1], Tarun Kumar[2], Vijay Parashar[3]

[1]Professor, Dean & Head, [2]Junior Resident, [3]Senior Resident

Faculty of Dental Sciences, Institute of Medical Sciences, Banaras Hindu University, Varanasi (UP), India,

ABSTRACT

Aim: This case discusses successful management of a discolored central incisor subsequent to endodontic treatment and its follow-up. Improper bleaching techniques can lead to cervical resorption and even loss of teeth. **Management**: Discolored endodontically treated tooth can be performed with sodium perborate using walking bleach technique. A 24-year-old male who had undergone endodontic treatment of the central incisor reported with discolored maxillary central incisor tooth. The case was managed with "walking bleach technique" using Sodium perborate and water. **Results:** Proper selection of bleaching agent and technique resulted in the conservative and successful management of the case.

Key words: Bleaching techniques, non vital tooth.

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Corresponding author: Dr. Tarun Kumar, Faculty of Dental Sciences, Institute of Medical Sciences, Banaras Hindu University, Varanasi.

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INTRODUCTION

Esthetic problems in adolescence can have a significant effect on psychosocial development and interaction. Impairment in the esthetic demandfor dental treatment to improve the teeth color in re-establishing patient's smile. The aesthetic[1] improvement of a patient's smile can have a profound effect on the patient's self-confidence and oral health.Walking bleach technique is based on the use of chemicals that release active oxygen such as hydrogen peroxide (H_2O_2) or sodium perborate (SP). A combination of SP and water or H_2O_2 has been used in the "walking bleach" technique[2]. 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 with chromophore molecules[3]. Although H_2O_2 exhibited excellent esthetic outcome, the undesirable consequences such as cervical resorption and irreversible damage to the dentin[4] and surrounding tissues lead the clinicians to look for alternative methods.

CASE REPORT

A 24-year-old male complained discoloration of hismaxillary right central incisor (figure 1). Patient's had history of trauma 10 months ago.

Figure 1. Preop image showing discolored tooth

After careful clinical examination, and vitality test, tooth was diagnosed with chronic asymptomatic irreversible pulpitis. The management protocol of the patient's was

planned as root canal therapy, followed by intracoronal bleaching using sodium perborate and water and then restored permanently with composite resin. Informed consent from the patient was obtained after discussing the treatment plan.Radiographic examination revealed that the periodontal ligament was continuous with no PDL widening, and obliteration of lamina dura was absent.

MANAGEMENT

Taking in consideration of chronic asymptomatic irreversible pulpitis, without mobility and pathology associated with the tooth, single visit root canal was planned as first phase of treatment.

After giving local anesthesia (Lignox 2%; Indoco Remedies Ltd., Mumbai), and rubber dam isolation (GDC Titanium Coated Clamps; Vasa Denticity Private Limited), access openingwas made. Biomechanical preparation was (BMP), was done with protaper gold file system (Dentsply; Switzerland). Normal saline and sodium hypochlorite 3% (Parcan; Septodont) was used as irrigation solution.Working length was determined with apex locator (Canal Pro Apex Locator, coltene; USA) and confirmed with IOPA radiograph. Guttapercha was sterilized, by keeping it in a 3% sodium hypochlorite solution for 1 minute.After drying canal with paper points (Diadent: korea), Obturation was done using sealapex (Sybron Endo, kerr) as root canal sealer.

After a week at the patient's second visit, the tooth was found completely asymptomatic; (figure 2)tooth was isolated using a rubber dam (GDC Titanium Coated Clamps; Vasa Denticity Private Limited).

Figure 2. Palatal view after obturation and temporary restoration

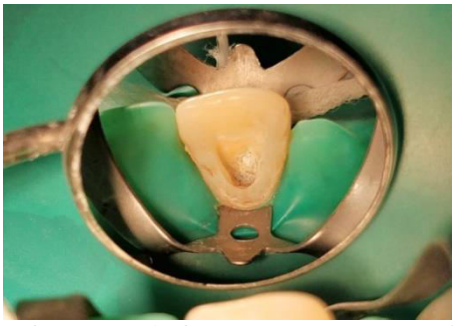

Figure 3. After removal of temporary ZOE restoration

After removal of zinc oxide eugenol (ZOE) up to the cementoenamel junction (CEJ), absolute alcohol was used to remove the remaining sealer from the chamber space (figure 3). 2mm thickness of glass ionomer cement (ShofuHy-Bond Glasionomer; Tokyo) was placed inside the pulp chamber as a leak proof plug (figure 4). This prevents percolation of bleaching agent into the cervical and apical region, which may leads to cervical resorption and apical periodontitis respectively. The base was made dome shape and keeping the barrier incisal to the cementoenamel junction(CEJ).The cavity was then irrigated with 1% orthophosphoric acid to remove any remnantdebris that might affect the efficacy of bleaching agents.

Figure 4. After placing GIC restoration

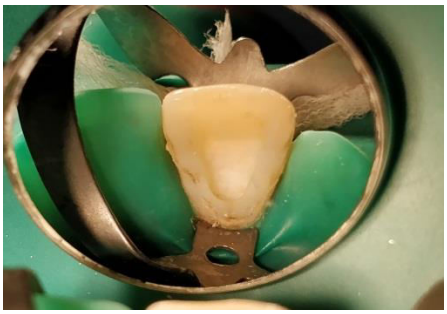

Figure 5.After placement of Sodium perborate

Figure 6. After restoration with GIC

Sodium perborate trihydrate powder mixed with water and placed inside the chamber space (figure 5), primarily to the internal labial wall ofthe tooth and temporarily restored (figure 6) with GIC (ShofuHy-Bond Glasionomer; Tokyo). Patient recalled every 7 days once, forchanging bleaching

agent if change in color was not found satisfactory. After 7 days, the color of tooth was not satisfactory (figure 7). The temporary GIC and bleaching paste was removed, which was then followed by thorough irrigation and bleaching agent placement was repeated. After 2nd weeks of follow-up, color change was noticed but not found to be satisfactory. So planned to repeat the bleaching agent for one more time.Color change was found to be satisfactory and acceptable after 3rd week (figure 9). Pulp chamber was then irrigated copiously, to remove any remaining bleaching agent, followed by permanent restoration with GIC and composite restoration. The Patient was followed up for more than a year and was found to be completely asymptomatic, without reversal of discoloration, or any sign of cervical resorption.

Figure 7: After 1st week

Figure 8: After 2nd week

Figure 9: After 3rd week

DISCUSSION

Discoloration of the anterior tooth due to trauma or endodontic treatment can cause esthetic compromise to patients. The management of postendodontic tooth discoloration includes various options as, full veneers, laminates, crowns, and noninvasive technique such as bleaching.The first description of the walking bleach technique with a mixture of sodium perborate and distilled water was mentioned in a congress report by Marsh and published by Salvas[6].Various studies shows that the pigment that causes the intrinsic discoloration of necrotic pulp consists of long-chain organic molecules. Bleaching will oxidize these long-chain molecules and transform them into carbon while releasing water and oxygen.

Non-vital bleaching has many benefits since it is a noninvasive procedure, economical, and less time-consuming. The three most popular techniques for non-vital tooth bleaching are the walking bleach technique, inside/outside bleaching and in-office bleaching. The walking bleach technique is a relatively reliable and simple technique. The outcome of the bleaching depends mainly on the concentration, duration and number of times of the bleaching agent is in contact[7],

Although H_2O_2 exhibits excellent esthetic outcome, lesser number of visits, but undesirable complications like cervical resorption and irreversible damage to the dentin and surrounding tissues[8] were reported by many authors. This can be explained asH_2O_2 can diffuse through dentinal tubules as far as the cervical periodontal ligament, affecting these structures and leads to inflammatory root resorption[9].External cervical resorption is mostly asymptomatic and is usually detected only through routine radiographs under different angulations. However, sometimes swelling of the papilla or sensitivity to percussion of bleached teeth can be observed.

SP has been widely used as bleaching agent with predictable results[10].In the presence of water, Sodium perborate dissociates into sodium metaborate, H_2O_2, and oxygen. SP when used with water, H_2O_2released in a controlled manner with remarkable esthetic outcome and little or no side effects[11].Studies have shown that the use of a mixture of SP and water shows less potential to cause cervical resorption. However, in the present case, the use of SP and water is used to prevent the development of resorption. The glass ionomer was placed as a barrier sealant in the present case to avoid leaching of bleaching agent.

According to Howell[12], walking bleach techniques have immediate success rate of 89.5% with a possibility of recurring discoloration that means initial results cannot be considered permanent. Holmstrup et al[13] and Brown[14] both reported a success rate of 75% or more after one to five years. Brown[14] reported that trauma or necrosis-induced discoloration can be successfully bleached in about 95% of the cases, compared with lower percentages for teeth discolored as a result of medicaments or restorations. Some authors, Feiglin[15] reported a success rate of only 45% after six years.Several studies shows that, younger patients are easier to bleach than discoloration in older patients,

because of wide open dentinal tubules in young teeth which enables better diffusion of the bleaching agent.In the present case we found more than 90% success rate without change in the color and with no periapical changes in the tooth.

CONCLUSION

The case presented highlights the effectiveness of the non-vital bleaching using SP and water to achieve successful and predictable cosmetic outcome. Hence, it can be concluded that walking bleaching technique using SP can be used as a treatment of choice for non-vital, discolored endodontically treated cases.

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