

Dead tooth walking for life- An innovative non vital walking bleach technique**Shashank Kumar Mishra¹, Uday N. Soni², Arpit Viradiya¹, Poorvin Prajapati¹, Tushar Bansal³**

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ABSTRACT:

The dominance of tooth whitening for patients and consumers has seen a pronounced amplification in the number of procedures over recent calenderyears. Literature suggests that the mechanisms of tooth whitening by peroxide occur by the dissociation of complex organic structures into simple structurewhich leads to lightning of tooth, particularly within the dentinal regions.

Customarily, dentist are presented with discoloured teeth after uprooting of a restoration and face baffling decision-making to judge for materials selection, tooth preparation depth, and design.

High-rise elevation of patient gratification after non-vital tooth bleach treatment strongly supports this treatment modality to be a conservative treatment alternative for traumatized discoloured anterior tooth.

Keywords: Bleaching, Carbamide peroxide, Discolouration, Non-vital tooth, Sodium perborate.

INTRODUCTION

There has been always a craving in all of us us to get our teeth as snow-white as possible. As we proceed in the fortune, this eagerness is persistently becoming like a passion as our society is getting more esthetic conscious. Craving of having whiter and eye catching teeth has been an esthetic treatment most desired by participants in numerous studies dealing with their dental appearance and treatment.¹

Discolouration of non-vital teeth can occur through extrinsic and/or intrinsic factors. Amongst the intrinsic stains, intrapulpal haemorrhage or pulp necrosis, commonly related with impact injuries of teeth, can be successfully managed using intracoronal bleaching.²

Extrinsic stains tend to form in areas of the teeth that are less accessible to tooth brushing and the abrasive action of toothpaste and is often promoted by smoking, dietary intakeof tannin-rich foods (e.g. red wine) and the use of

certain cationic agents such as chlorhexidine, or metal salts such astin and iron.^{2,3,4} Tooth colour can be improved by a number of methods and approaches including whitening toothpastes, professional cleaning by scaling and polishing to remove stain and tartar, internal bleaching of non-vital teeth, external bleaching ofvital teeth, microabrasion of enamel with abrasives and acid, placement of crowns and veneers.^{2,6,7}

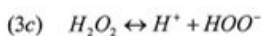
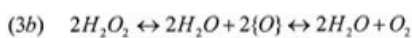
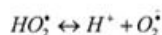
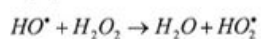
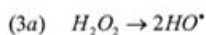
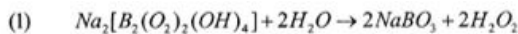
HISTORY OF BLEACHING

Bleaching of discolored, pulpless teeth was first described in 1864 (Truman, 1864), and a variety of medicaments such as sodium hypochlorite, sodium perborate, and hydrogen peroxide, chloride, carbamide peroxide has been used, alone, in combination, and with and without heat activation (Howell, 1980). The "Non vital bleaching" technique that was introduced in 1961 involved placement of a mixture of sodium perborate and H₂O into the pulp chamber that was sealed off between the

patient's visits to the clinician. The method was later modified and H₂O replaced by 30-35% hydrogen peroxide, to improve the whitening effect. The scrutinization that different concentration of carbamide peroxide caused lightening of the teeth was made in the year 1960s by an orthodontist who had prescribed an antiseptic containing 10% carbamide peroxide to be used in a tray for the treatment of gingivitis. The result was transmitted to fellow colleagues and must be interpreted as the start of the night guard bleaching era. 20 years later, this technique describing the use of 10% carbamide peroxide in a mouth guard to be worn nightlong for lightening tooth color was published (Haywood and Heymann, 1989).^{8,9,10}

MECHANISM OF BLEACHING

Now a day bleaching is mainly based upon hydrogen peroxide as the active agent. Hydrogen peroxide may be applied directly, or produced in a chemical reaction from sodium perborate or from different concentration carbamide peroxide.^{8,11,12}



The formation of hydrogen peroxide from sodium perborate (Eq.1)¹¹ and from carbamide peroxide (Eq.2)¹². Hydrogen peroxide forms free radicals like hydroxyl and perhydroxyl radicals, and superoxide anions (Eq. 3a)¹³, reactive oxygen molecules that are unstable and transformed to oxygen (Eq. 3b)¹⁴, and hydrogen peroxide anions (Eq. 3c)¹⁴.

Hydrogen peroxide acts as a strong oxidizing agent through the formation of free radicals,

hydrogen peroxide anions and reactive oxygen molecules. These reactive molecules attack the long-chained, dark-colored chromophore molecules and split them into smaller, less colored, and more diffusible molecules. Carbamide peroxide also generates some amount of urea that further disintegrates into carbon dioxide and ammonia. However, it is still uncertain, how much ammonia is formed in the reaction with carbamide peroxide. For the formation of free radicals from hydrogen peroxide with an increased rate of reaction, basic solution (high pH) is preferred, which results in higher yield, compared with an acidic environment.^{3,13,14}

The net result of the bleaching mainly depends on the concentration of the bleaching agent, duration, ability of the agent to reach the chromophore molecules and number of times the bleaching agent is in contact with chromophore molecules.³

CASE REPORT

A 19 year old male patient was reported to the department of conservative dentistry and endodontics with a complaint of discoloured upper anterior teeth. Patient had a history of trauma with anterior teeth 1 year back. Intraoral examination revealed discoloured maxillary right central incisor. Root canal treatment followed by non-vital bleaching was planned. Consent of patient was taken and all the risks associated with the procedure were informed.

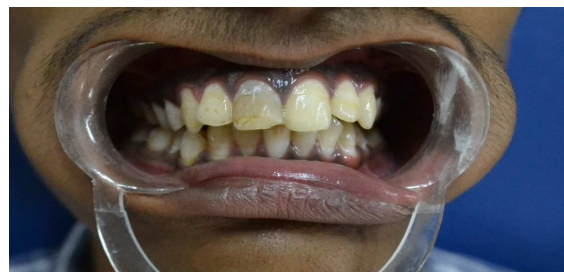


Figure 1: Pre-operative photograph

Access opening and complete biomechanical preparation were done with #11. As an intracanal medicament calcium hydroxide (RC Cal; Prime Dental Products, Thane, India) was kept for around 21 days. Further obturation was done with lateral condensation procedure.

and patient was recalled after 7 day for non vital bleaching. In order to place a GIC (GC Fuji PLUS, GC Corporation, Tokiyo, Japan) barrier to prevent external cervical root resorption gutta-percha was removed to around 2 mm below cemento-enamel junction with gates glidden drill (Dentsply Maillefer, Ballaigues, Switzerland) then a plug of glass ionomer cement was placed with a “ski slope appearance”¹⁵ or like a “bobsled tunnel”¹⁵ in the mesial and distal wall. Sodium Perborate bleaching powder (Ases chemicals, Jodhpur, India) along with 30% Hydrogen peroxide (Kashyap industries, India) was used for bleaching. Both of these agents are properly mixed and placed inside the cavity then the access cavity was sealed with IRM cement (Dentsply De Trey GmbH, Konstanz, Germany) and patient was recalled after 72 hours for followup. Same procedure was performed in second visit as slight discoloration was present with the concerned tooth. In a span of one week, bleaching procedure showed complete removal of stains from the tooth and present colour was comparable to adjacent tooth.⁷ Coronal access cavity was sealed with composite resin (3M Dental Products, St Paul, MN, USA.)



Figure 2: After root canal treatment

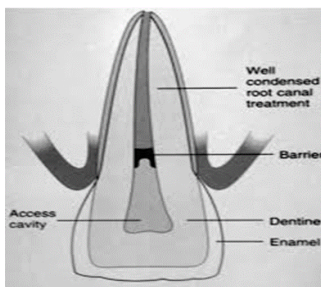


Figure 3: Ski slope appearance



Figure 4: GIC barrier placement with ski slope appearance



Figure 5: Post-operative photograph

DISCUSSION

For single-tooth discoloration the most obvious reason has been traumatic injuries to tooth, which is the case here also as most of the participants gave a history of trauma in relation to the discolored tooth. It has been observed that the tooth with recent history of trauma and teeth of young patients were more impressible to intracoronal bleaching procedure. Apart of this, number of requirement needed to obtain the adesirable shade was lesser in such participants. On the contradictory, patients with old trauma history or older age group required more appointments, and the final shade obtained were often compromised.⁴ The bleaching of non-vital teeth is a relatively lowrisk intervention to successfully improve the esthetics of endodontically treated teeth.¹

CONCLUSION

From the present cases it was concluded that, the bleaching procedure is more economical

and less invasive than other invasive tooth whitening procedures. This technique provides minimum threat of complications and more promising results and with the continued interest in tooth whitening amongst basic and clinical researchers, the further mechanistic understanding and optimisation of the factors controlling the tooth whitening process will continue to expand.

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