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Bleaching of Non Vital Anterior Tooth, Noninvasive Technique: A Case Report

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Abstract: *Discoloration of the anterior tooth, can result in considerable cosmetic detriment in patients. Treatment of such cases pose challenge for the dental practitioners. A variety of treatment options for discolored non vital teeth are bleaching, crowns or veneers. Bleaching offers a simple and conservative approach in removal of intrinsic stain. This article describes a case of non vital bleaching which was performed on a root canal treated tooth with no reversible discoloration or cervical root resorption.*

Keywords: *non vital; tooth bleaching; tooth discoloration; sodium perborate; walking bleach.*

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I. Introduction

Tooth dyschromia constitute a clinically visible deviation from the normal dental colour.[1,2] This creates an aesthetic problem that can become a great concern for patients. Various intrinsic and extrinsic factors can influence tooth colour. Intrinsic factors include traumatic factors, drugs, progressive dystrophies, physiological process of ageing. Extrinsic factors, which affect the external surfaces of teeth and may be the result of habits, diet or both.[3] Traumatic injury to the anterior tooth is one of the main causes that mostly result in a non vital tooth with discolouration. In the present era of aesthetic dentistry, bleaching of discolored teeth either vital or non vital has become popular. It is considered a conservative clinical approach, where a chemical or bleaching agent is applied to the surface or the interior of the tooth. Non-vital or internal tooth-bleaching is used to lighten a discolored tooth that previously received root canal therapy.[4] Today's market offers a variety of bleaching agents for tooth-whitening. Of these, sodium perborate, also called perboric acid, is the most trusted among dentists for use as an internal bleaching agent, due to excellent results and its respect for the periodontal tissues. "Walking bleach" technique, an internal bleaching procedure can be used for whitening of discolored root-filled teeth, which is a time-saving and simple method with good aesthetic result, safe and has good prognosis. The present article reports the successful bleaching of discolored non-vital, endodontically treated tooth using walking bleach technique with no side effects and a favourable prognosis.

II. Case Report

A 32-year-old female, reported to the out patient department with history of discolored upper right front tooth. On clinical examination the maxillary right central incisor tooth was structurally intact and firm. Patient gave history of fall from motorbike. A diagnosis of non vital tooth was done by performing an electric pulp tester and cold test. Conventional endodontic treatment was performed followed by the bleaching using sodium perborate with hydrogen peroxide in the ratio 2:1(gm/ml).

Bleaching technique protocol

1. Diagnosis and treatment planning.
2. Prophylaxis, recording of initial tooth colour according to the VITA colour guide, and the procurement of initial images.
3. Tooth isolation to protect adjacent structures from the bleaching agent.
4. Reshaping of the access cavity, so as to properly expose and clean the pulp horns and other "hidden" areas .
5. Reduction of the root filling by approximately 1-2mm in an apical direction from the clinical crown height, thereby generating space for the application of a cervical sealing material, and the exposing of dentinal tubules for the application of the bleaching agent.(Fig 1)
6. Application of a mechanical cervical seal (double barrier) with a layer of light-curing glass-ionomer cement placed upon it, to minimize leakage of the bleaching agents.
7. Removal of the smear layer is done by acid conditioning with 37% phosphoric acid for 30 seconds .

8. Application of the bleaching agent. A paste consisting of sodium perborate and 3% hydrogen peroxide (H_2O_2), was applied in the pulp chamber.
9. Temporary filling with cavit(3M).
10. Occlusal adjustment.

Bleaching agent was replaced every 1 week and the procedure was repeated until desired results were obtained. Clinical evaluation was recorded by comparing the tooth shade with its original one before treatment using the Vita porcelain shade guide and photographs

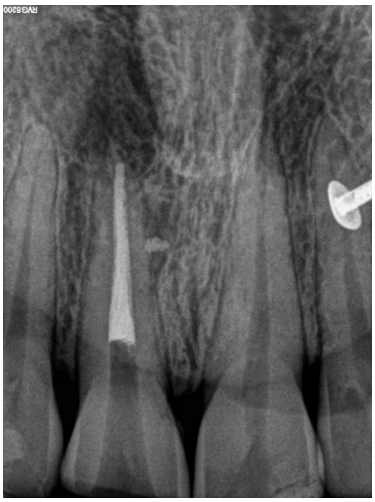

Fig 1: immediate post obturation radiograph with gutta percha removed 2mm below CEJ

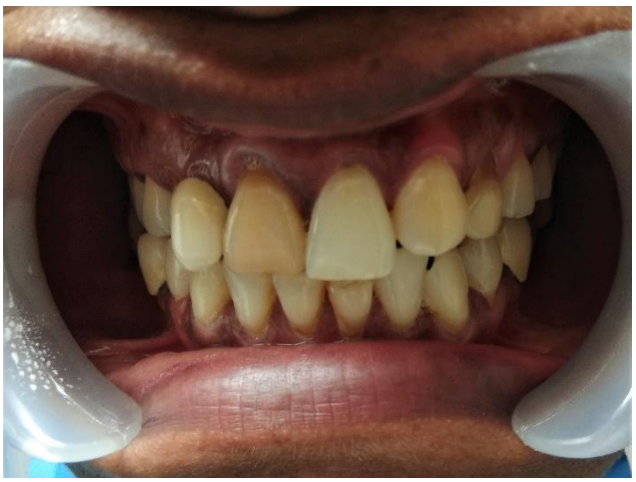

Fig 2: Discoloured maxillary right central incisor

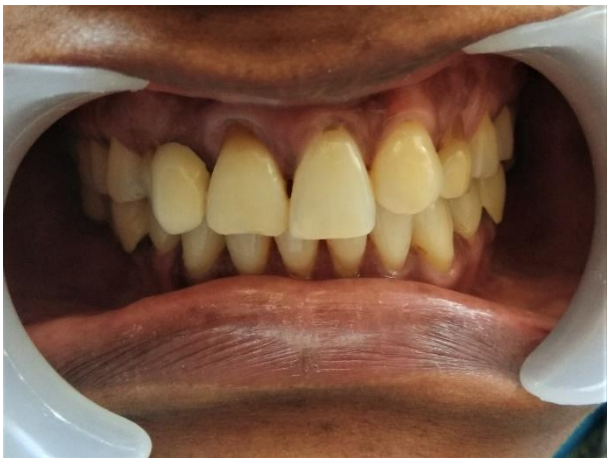

Fig 3: Post bleaching appearance after 2 weeks

III. Discussion

For a tooth that had discolored following de-vitalization, bleaching is preferable to the crown placement when the tooth is relatively intact.[5] In vitro studies suggested that it is the bulk of the remaining tooth structure rather than the dowel that provides strength and resistance to fracture of the endodontically treated tooth.[6] A previous study reported no significant difference in the success rate achieved between anterior non-vital teeth with and without crowns.[7] Thus, supporting our view that endodontically treated anterior teeth do not require crowns.[8]

Walking bleach technique is performed by application of a paste consisting of sodium perborate and distilled water or 3% hydrogen peroxide (H_2O_2), in the pulp chamber. This mixture releases H_2O_2 which reacts with the staining substances.[9]

A laminate veneer may offer a less destructive alternative to the crown. It may mask the discoloration, but may also undergo debonding, marginal leakage and fracture. However, it requires tooth preparation and is irreversible.[10]

The major advantages of non vital bleaching are (1) it is more conservative (2) more effective in stain removal and (3) significantly improves the appearance of tooth color.

Non vital bleaching is not being preferred amongst the clinicians because of the fear of resorption following the procedure, which has a poor prognosis. But in this case report adhering to the proper barrier placement methods can definitely prevent the development of the resorption. The protective barrier was placed 1 mm below the facial CEJ because it resulted in more acceptable aesthetic results, particularly in the cervical region .However, this procedure exposed more dentinal tubules, leading towards the approximal cervical parts of the periodontal ligament. But the placement of the intra-coronal bleach barrier based on Steiner and West's protocol prevents the extra radicular diffusion of the bleaching agent.[11]

IV. Conclusion

Anterior tooth trauma, with or without fracture/s may or may not involve the pulp. While selecting a type of treatment or restorative material, the amount of tooth structure destroyed, location of the fracture and the severities of discolorations are taken into account. When anterior tooth is discolored and non vital, but is structurally intact, it should be preferentially endodontically treated with the minimal access cavity opening and using bleaching technique. This approach is minimally invasive than complete ceramic, ceramic fused to metal, or veneers, which removes substantial amount of tooth structure, leading to irreversible damage, and are expensive. Non vital bleaching provides good aesthetics and economical benefits to the patients. The type of intrinsic stain can play a significant part in the ultimate outcome of tooth bleaching, and choice of treatment depends on clinical experience and judgment of dentist in context of patient's circumstances.

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