

Management of discoloured endodontically treated tooth using walking bleach technique: A Case Report

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Abstract: Bleaching is an effective conservative method in the management of discoloured teeth. Non-vital or root canal treated teeth may become intrinsically discoloured. Walking bleach technique can be used to whiten such teeth. It involves the placement of mixture sodium perborate and water or hydrogen peroxide in the pulp cavity as bleaching material. This case report describes the management of discoloured endodontically treated tooth using walking bleach technique.

Keywords: Tooth discolouration, Bleaching, walking bleach, hydrogen peroxide, sodium perborate.

INTRODUCTION

With evolution in Aesthetic Dentistry, more and more individuals are becoming aware of various treatment modalities to enhance the aesthetics. The practice of aesthetic dentistry has become an integral part of general dental practice. Every person wishes for a perfect smile without any flaws [1].

One of the commonly encountered concern of the patients for which they seek aesthetic treatment is the discoloured teeth. The teeth may be discoloured either intrinsically or extrinsically. The characteristics of discolouration vary widely with its etiology. Intrinsic discolouration may result from systemic or local factors. The common local causes of intrinsic discolouration of teeth include intra-pulpal haemorrhage, pulpal necrosis, incomplete removal of pulpal remnants during root canal treatment and coronal restorative materials [2].

The most common treatment modality for management of discoloured teeth is the 'bleaching' of teeth. It is the most 'non-invasive' method to modify the tooth colour to an aesthetically pleasing appearance. The various techniques of bleaching comprise of in-office method, dentist supervised home-bleaching, bleaching using over-the-counter products and walking bleach technique/ non-vital bleaching [3].

Trauma to teeth may result in intra-pulpal haemorrhage & subsequently necrosis of pulp, thus necessitating root canal treatment. During root canal treatment, pulpal remnants may not be completely removed & result in subsequent tooth discolouration [4]. In such cases, 'non-vital bleaching', also called as 'walking bleach', is the treatment of choice [5].

Various materials have been used to bring about the lightening of the tooth colour. They include carbamide peroxide, hydrogen peroxide, calcium hypochlorite & sodium perborate [6]. In non-vital bleaching, hydrogen peroxide and sodium perborate are commonly used as bleaching agents, either in combination or independently.

CASE REPORT

A 17-years old female patient reported to the Department of Conservative Dentistry & Endodontics with a chief complaint of discoloured upper right front tooth from six months. She did not have any pain or discomfort associated with the tooth. She informed that she had suffered from trauma about 1 year back & had severe pain with the same tooth at that time. Root canal treatment was carried out with the affected tooth within a week of trauma incident & restored with a tooth-coloured restorative material. She noticed discoloration in the same tooth about six months back. She informed that the discolouration increased over a period of time. Clinical examination showed a brown to black intrinsic discolouration with maxillary right central incisor (Fig. 1). The coronal tooth structure was intact without any fracture. Tooth coloured coronal restoration was visible on the palatal surface. Intraoral periapical radiograph showed an adequate obturation with 11. There was no periapical radiolucency associated with 11. Patient & her parents were informed about the cause of discolouration and need for treatment by non-vital bleaching. Patient & her parents agreed for the treatment plan. Informed consent was obtained.



Figure 1 Pre-operative photograph

Shade of the discoloured tooth was assessed in a daylight using Vita shade guide & pre-treatment clinical photograph was taken. Rubber dam was applied. Coronal restoration was removed using a high-speed handpiece. Coronally, 2 mm of gutta percha below cemento-enamel junction was removed. Coronal cavity was rinsed with water and dried. 2 mm layer of glass ionomer cement was applied in this area to form a 'cervical seal' and allowed to set. After setting of glass ionomer cement, sodium perborate powder was mixed with 3% hydrogen peroxide in 2:1 ratio. The mix was placed in the coronal cavity using amalgam carrier. A cotton pellet was placed over it and the cavity was sealed using a temporary restorative material. Patient was recalled after a week.

At second visit, the shade of the tooth was lighter. Temporary restorative material and bleaching agent was removed. It was rinsed, dried and the bleaching agent was re-applied for another week. At third visit, the shade of the tooth was matching with that of the adjacent tooth and the patient was satisfied with the result of bleaching (Figure 2). Post-treatment shade of the tooth and clinical photograph were recorded. After removal of temporary restoration and bleaching agents, the cavity was filled with calcium hydroxide paste for 2 weeks and temporarily restored. After 2 weeks, the cavity was restored using composite resin.



Figure 2 Post-bleaching photograph

DISCUSSION

Non-vital teeth get discoloured commonly due to internal pulp bleeding induced by traumatic injury to the tooth or diffusion of components of blood into the dentinal tubules during extirpation of pulp. The blood accumulated in the dentinal tubules degrades over time and degradation products (like haemin, haemosiderin and haematin) release iron [4].

Various techniques can be used to treat the non-vital discoloured teeth. Walking bleach is a common technique used to whiten discoloured non-vital or root canal treated teeth, which involves the placement of mixture of sodium perborate and water or hydrogen peroxide in pulp chamber. An external bleaching using carbamide peroxide gel may also be used for bleaching of endodontically treated teeth [7]. Thermo-catalytic technique involves placement of 30-35% H_2O_2 in pulp cavity and heating it using a heated instrument or lamp [8].

Walking bleach technique has proven to be a successful method in management of such cases. Sodium perborate mixture decomposes to release H_2O_2 . Different radicals or ions are generated from H_2O_2 , which have the ability to crack the unsaturated double bonds of long, coloured molecules or reduce the coloured metallic oxides. This results in lightening of tooth colour or 'bleaching effect' [9].

Root canal obturation materials cannot completely prevent the diffusion of bleaching materials from pulp cavity to apical part [10]. Hence, it is necessary to place a 2mm barrier of glass ionomer cement. It should be placed up to the level of epithelial attachment or cemento-enamel junction [11].

The bleaching agent used in walking bleach technique is 'sodium perborate (tetrahydrate)'. It can be mixed with either water or 3% H₂O₂. Various studies have evaluated whether sodium perborate mixed with H₂O₂ is more effective than that mixed with water. Most of the studies have shown that there is no significant difference between them [12, 13]. 3% H₂O₂ may be preferred to be mixed with sodium perborate in case of severe discolouration.

The commonest complication associated with walking bleach technique is the 'cervical resorption' [14]. It is usually asymptomatic and only detected during routine radiographic examination. Use of 30% H₂O₂ as a bleaching agent or thermo-catalytic technique involving heating of 30% H₂O₂ should be avoided as it predisposes the bleached teeth to cervical resorption [15]. A radiograph may be taken at 1 year follow up to rule out the presence of cervical resorption.

CONCLUSION

Walking bleach technique is an effective method for management of discoloured non-vital or root canal treated teeth.

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