

## CASE REPORT - PUBLIC HEALTH

## NON-VITAL TOOTH BLEACHING: A REPORT OF TWO CASES

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#### Abstract

**ABSTRACT:** Intrinsic discoloration of the anterior teeth may have a considerable influence on the cosmetic aspect and the personality of an individual. The prime reason for this is the alteration in structure and composition of the dental hard tissues. Factors such as tooth injury, ageing, systemic or metabolic diseases play an important role in intrinsic discoloration. The amount of tooth structure destroyed, location of the fracture and the severities of discolorations are considered while selecting a type of treatment, a type of restorative material and kind of tooth preparation. There are numerous treatment options for tooth discoloration like placement of veneers, crowns and bleaching. The advantages of selecting bleaching technique for non-vital tooth over veneers or crowns are that it is minimally invasive, more esthetically appealing and less expensive. Nevertheless, it relies on the clinician's skill and knowledge to progress ahead with a good case selection and to prevent any post procedural glitches that may befall. This present article emphasizes on two cases of non-vital discoloured teeth that were treated by walking bleach method using a mixture of hydrogen peroxide and sodium perborate.

**KEYWORDS :** Non vital tooth, walking bleach, esthetic, hydrogen peroxide, sodium perborate

## INTRODUCTION

Tooth discoloration can significantly affect the esthetic appeal and the self-confidence of an individual in society; hence its treatment is suggestive. Discoloration of tooth can be broadly classified into extrinsic and intrinsic (Dayan et al 1983, Hayes et al 1989). Extrinsic discoloration is due to accumulation of stains on the external surface of the tooth or within the acquired pellicle.<sup>1</sup> Several factors like drugs, intake of food and beverages, tobacco or cigarettes, amalgam or poly-antibiotic paste and chromogenic bacteria influence this form of pigmentation. Intrinsic stains can be caused due to hereditary disorders (amelogenesis imperfecta, Dentinogenesis imperfect, dental dysplasia), infections (maternal rubella or cytomegalovirus) and excess fluoride intake. Internalized discoloration is a new term that has been introduced to define stains that are extrinsic in nature but enter into enamel or dentin via developmental defects.<sup>2,3</sup>

Non-vital tooth discoloration can be amended via tooth bleaching or masking by placement of crowns or veneers. Tooth bleaching is a considerable cost-effective, less invasive and simple approach where agents like carbamide peroxide, hydrogen peroxide and sodium perborate are employed.<sup>4</sup> Walking bleach technique involves placing of active bleaching agents into the pulp chamber that leads to oxidization of organic pigments.<sup>5</sup> The area is then enclosed by placement of calcium hydroxide dressing. The present

article describes two cases of non-vital teeth that were treated by walking bleach technique.

## CASE HISTORY

**CASE REPORT 1 :** A 21-year-old female presented to our department with the chief complaint of discolored tooth in the upper front tooth region. The patient presented with the history of trauma by fall 3 years back. On intra-oral examination, tooth discoloration was observed with respect to 21. The tooth was non-mobile and did not exhibit any fracture. (Figure: 1) However, it did not show any response to cold test or electric pulp test demonstrating a necrotic pulp. Radiographic investigation revealed no periapical changes. Hence, it was decided to perform root canal therapy followed by bleaching therapy. The patient was detailed about the procedure and written consent was obtained.

Access cavity preparation was performed on the lingual aspect of 21 with the help of round bur and endo-Z bur. Working length was established using third generation apex locator. After accomplishing biomechanical preparation,



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obturation was done by lateral condensation technique. Subsequent to this step, 2 mm of gutta percha was eliminated beyond the gingival margin. A layer of Glass ionomer cement (GIC) (approximately 2 mm in thickness) was placed to prevent the internal resorption. A thick paste of bleaching agent (comprising 35% hydrogen peroxide + sodium perborate mixed with saline) (Figure: 2) was placed in the pulp chamber which was removed after 10-15 minutes with the help of suction and water. The procedure was repeated for four times (once in every consecutive week for a month) and after the desired result was obtained, the tooth was restored with composite resin. (Figure: 3)



Figure 1 : Non vital tooth w.r.t. 21



Figure 2 : Placement of bleaching agents (comprising 35% hydrogen peroxide + sodium perborate mixed with saline)



Figure 3 : Effective aesthetic results after 1 month

**CASE REPORT 2 :** A 33-year-old female patient reported with the chief complaint of tooth discoloration in the upper front tooth region. On intra-oral examination dark yellowish discoloration was noted on the 11 tooth. (Figure: 4) The non-vitality of the tooth was confirmed by electric pulp test and cold test. There were no peri-apical changes demonstrated in the radiograph. Conventional endodontic therapy was planned followed by non-vital tooth bleaching. (Figure: 5) Following obturation, 2mm of gutta percha was removed near the orifice and 2mm of GIC was placed as a barrier between the bleaching agent and the sealed canal. The bleaching technique was performed with the help of bleaching agent (comprising 35% hydrogen peroxide + sodium perborate mixed with saline). The procedure was repeated for four times at a one-week interval. The desired result was noted after the fourth visit (Figure: 6) and consequently composite restoration was performed.



Figure 4 : Non vital tooth w.r.t. 11



Figure 5 : Root canal therapy w.r.t 11



Figure 6 : Effective esthetic results after 1 month

## DISCUSSION

Diffusion of blood components into the dentinal tubules induced due to trauma might lead to discolouration of the tooth. The iron released during the disintegration process can be converted to black ferric sulfide. Further, the hydrogen sulfide further released by bacteria can produce grayish stain on the teeth.<sup>6</sup> Brown (1965) stated that trauma or necrosis induced discolouration can be effectively treated in about 95% of cases teeth discoloured as a result of drug interactions or restoration. The bleaching agent containing hydrogen peroxide releases reactive oxygen species that helps to disrupt conjugated bonds into single bonds which can be easily washed off.<sup>7</sup>

The benefit of this therapy is that it aids in good cosmetic results and is economical. Further, the procedure is much less invasive than conventional ceramic crown placement or veneers. On the other hand, for laminate or crowns the tooth may have to undergo destructive changes and irreversible alterations. Also, there can be chances of debonding, marginal leakage or fracture of the restoration in the future. Several factors determine the success of the therapy like the extent of tooth destruction, the degree of tooth fracture, the severity of discolouration, the choice of restorative material and the kind of tooth preparation.<sup>8</sup> Lado et al. hypothesized that this peroxide may lead to denaturation of the dentin at the cervical area. Disintegration of the organic matter is chiefly due to the oxidizing behaviour of hydrogen peroxide, while the inorganic portion is destroyed due to acidity.<sup>9</sup>

Numerous problems have been related to non-vital teeth bleaching such as infiltration of hydrogen peroxide into the tubules, alterations in the dentin framework and permeability, wearying of the hard tissues, dental fracture during the procedure, over-bleaching and possibility of relapse. However, both the patients were followed up for a period of one month and no such complications were noted. A concerning complication of tooth bleaching is external cervical resorption. It is typically symptomless and perceived

through routine radiographic inspection. It has been proposed that thirty percent of hydrogen peroxide when used alone or in combination with sodium perborate induces more cytotoxic effect on periodontal cells than perborate-water mixture.<sup>10,11</sup>

## CLINICAL SIGNIFICANCE

In the recent times of esthetic treatment that targets for a beautiful smile and concurrently at less invasive therapy for better clinical result, adopting walking bleach technique for whitening of discoloured teeth can be opined as a comparatively easy, rapid and convenient tactic for favourable outcome.<sup>12</sup>

## ACKNOWLEDGEMENT : Nil

## CONCLUSION

A non-vital, discoloured tooth with minimal structural damage is best suited for non-vital tooth bleaching. It is crucial for dental practitioner to select appropriate case for the procedure and also to scheduler regular check-ups.

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