



ORIGINAL RESEARCH PAPER

Dentistry

COSMETIC REHABILITATION-COMBINATION OF INSIDE-OUTSIDE BLEACHING AND DIRECT COMPOSITE BUILD UP: A CASE REPORT

KEY WORDS: Inside outside bleaching, walking bleach, hydrogen peroxide, barrier.

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ABSTRACT

Patients may get very concerned if they have a tooth with unsightly stains, which may prompt them to seek expert dental consultation. A variety of techniques are employed to address this problem and Bleaching was one of the oldest techniques developed, utilizing a range of bleaching agents like hydrogen peroxide, sodium perborate, carbamide peroxide etc. Among the various non vital bleaching techniques in this case report, the inside-outside bleaching technique was used in conjunction with walking bleach and direct composite building up, and outstanding aesthetic results were achieved.

INTRODUCTION

Patients may get very concerned if they have a tooth with unsightly stains, which may prompt them to seek expert dental consultation and/or treatment¹. And the reasons for, how it looks, where it is located, how severe it is, and how closely it adheres to the tooth structure vary and pertains to its etiology².

Trauma is one of the most common causes of discoloration and accounts for roughly 10.2 to 69.2% of cases with discolored teeth², in addition to being the cause of the current case. Post trauma it is the external manifestation of pathology in the pulp-dentine complex, which becomes obvious to the eyes through the enamel because of its transparency³.

A variety of techniques have been developed to address the problem of a single pulpless discoloured tooth. Bleaching was one of the oldest techniques developed in 1864 by TRUMAN to treat discolored non vital teeth and a range of bleaching agents including hydrogen peroxide, carbamide peroxide, sodium hypochlorite, chloride, sodium perborate etc. have been utilized, either alone or in combination³.

Among the various non vital bleaching techniques, inside-outside bleaching technique was used in this case report and the aim was to describe the combination of this inside outside bleaching technique along with walking bleach and direct composite build up for the esthetic rehabilitation of a young patient.

Case Report

A 22-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of fractured and discolored tooth in his upper front teeth region since 6 months. Patient also gave a history of road traffic accident 1 year ago and no other relevant medical and dental history. On clinical examination there is Ellis class II fracture and discoloration with tooth 21 (Figure 1a) On vitality testing both 21 and 22 showed negative response with cold, hot and electric pulp testing. Radiographic examination revealed periapical radiolucency with both 21 and 22(Figure 1b).

Based on the clinical and radiographic findings the diagnosis was pulp necrosis with asymptomatic apical periodontitis with 21. The treatment plan was a combination of Root canal therapy followed by non-vital bleaching and direct composite build up with 21 and root canal treatment alone with 22.

Treatment Protocol:

After obtaining the informed consent access opening of 21 and 22 was done under local anesthesia and rubber dam isolation (Figure 2a). Working length was determined using 10 k files (Figure 2b) followed by cleaning and shaping under copious amounts of 17% EDTA, sodium hypochlorite and saline irrigation and disinfection was achieved by giving a 7 day dressing of calcium hydroxide (RC Cal, Prime dental products Pvt.Ltd) following which Obturation was done using later condensation technique (Figure 2c).

Non Vital Bleaching:

Inside outside technique of bleaching was advocated. The placement of the barrier, which entails the removal of 2 mm of gutta-percha below the level of the CEJ, was a crucial first step (Figure 2d). This was then followed by the placement of a GIC barrier (Figure 2e), which serves as a Cavo surface seal to protect the proximal dentinal tubules and prevents percolation of the bleaching agents. And prior to this, external probing in all areas of the teeth should be done to determine the positioning of the barrier.

The pulp chamber was cleared off the debris and conditioned with 37% orthophosphoric acid. Strict isolation with rubber dam, opal dam (Figure 3a) and protection of soft tissues with a petroleum jelly was done for a better patient compliance.

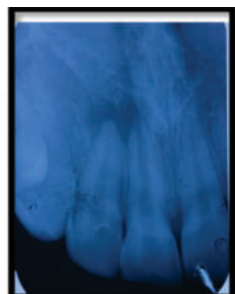


Figure 1a: Pre operative clinical picture showing discoloured 21

Figure 1b: Preoperative intraoral periapical radiograph of 21 and 22 showing periapical radiolucency.



Figure 2a: Access opening

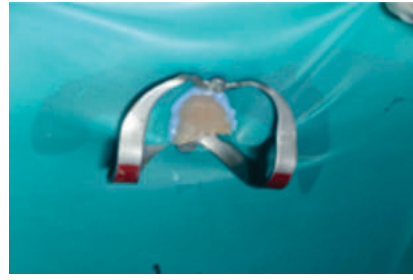


Figure 3a: Isolation with rubber dam and opal dam

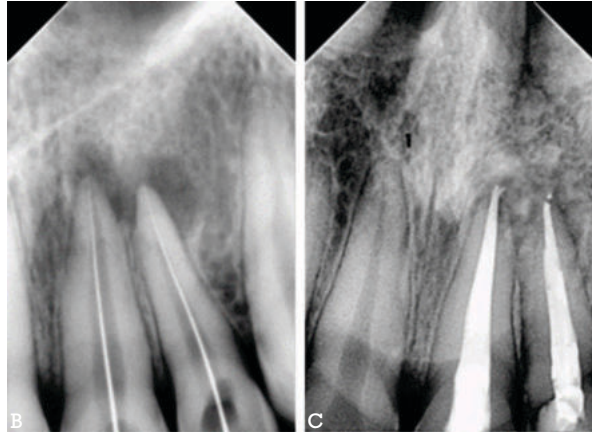


Figure 2b: Working length determination

Figure 2c: post-obturation with 1 week follow up

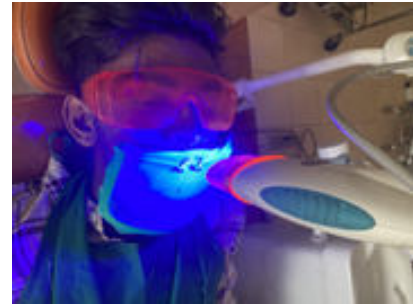


Figure 3b: light activation using LED lamp

35% hydrogen peroxide gel (Pola Office, SDI, Victoria, Australia) was carefully placed inside the pulp chamber and labial surface of 21 and light activated for about 8 minutes with LED light (Figure 3b). The tooth was cleaned of the bleaching agent and fresh hydrogen peroxide was replenished and the cycle was repeated, a discernible shade lightening was seen after each cycle (Figure 4 a,b). After this procedure the tooth was completely cleaned and a walking bleach constituting a mixture of sodium perborate and 10 % hydrogen peroxide was placed inside the pulp chamber and temporized with cavit (Cavit, 3MESPE, Minnesota, USA) and the patient was recalled after a week and was prescribed with a desensitizing tooth paste



Figure 4a: picture after 1st cycle of inside outside bleaching.

Figure 4b: picture showing shade after 2nd cycle of inside outside bleaching.

Figure 4c: post 1 week walking bleach

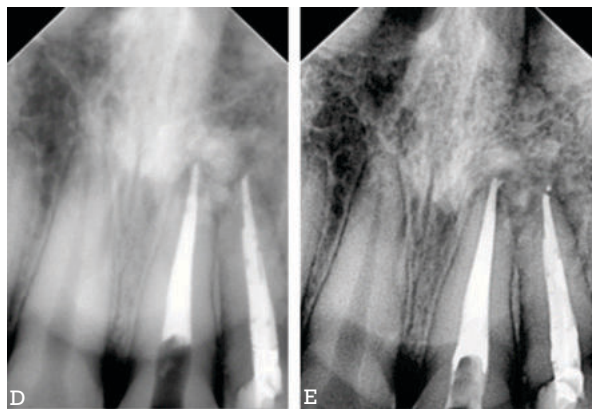


Figure 2d: Gutta percha removal.

Figure 2e: GIC barrier

During the subsequent visit, a noticeable hue lightening that matched the neighboring tooth was seen (Figure 4c) and the patient was satisfied with the resultant shade in every way. So, the shade was recorded as A2 according to vita shade guide (Figure 4d) following which the corresponding restoration of the fractured segment and post endodontic restoration was done using a nanocomposite (Figure 4 e, f) (Tetric® N-Ceram Bulk Fill, Ivoclar Vivadent) for better strength and colour stability.

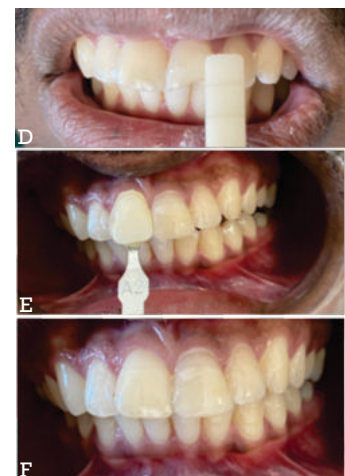


Figure 4d: shade recording post bleaching

Figure 4e: picture showing direct composite build up.

Figure 4f: final post operative picture after finishing and polishing

DISCUSSION

There are numerous methods for treating stained teeth. The quantity of tooth structure that must be removed to get a comparable aesthetic result, however, differs significantly¹. Bleaching is one such conservative, quick and cost-effective procedure that never discourages the patient. Inside – outside technique of bleaching with slight modification from the original technique introduced by settembrini et al with 10 % carbamide peroxide gel have been followed in this case report, where in 35% hydrogen peroxide gel was used

There is ample literature backing up the hydrogen peroxide's finest effects. One significant advantage of inside outside bleaching is the larger surface area that is available both externally and internally for the bleaching agent, which reduces the working time. Also, this technique is advised in cases where simultaneous bleaching of non-vital and vital teeth is necessary in the same arch.⁴

In a similar case report by Patil AG et al, 4 cycles of inside outside bleaching with 38 % hydrogen peroxide gave excellent results in a young patient⁵. The treatment outcome is primarily influenced by the bleaching agent's concentration, accessibility to the chromophore molecules, length of time and frequency of interaction with the molecules³.

Hydrogen peroxide being a strong oxidizing agent forms free radicals' reactive oxygen molecules, and hydrogen peroxide anions which attack the long-chained, dark-coloured chromophore molecules and split them into simpler and more diffusible molecules there by lightening the shade of the stained tooth⁵.

In the present case report along with inside outside bleaching, modified walking bleach technique by Nutting and Poe was also followed which included placement of sodium perborate and hydrogen peroxide mixture in situ for roughly a week. As an adjuvant therapy walking bleach procedure assisted in achieving quick and excellent outcome in this instance.

One of the potential side effects of bleaching nonvital teeth is cervical resorption. To prevent this a proper barrier should be placed post root canal therapy and this barrier should represent a **bobled tunnel** appearance when viewed from the facial aspect and **ski slope** from the proximal surface.

A conservative direct composite build up is proposed for cosmetic rehabilitation in this reported case because the access aperture is modest and the tooth structural loss is minimal. A nanohybrid composite was used weighing the benefits, the durability, and the longevity of the restoration.

CONCLUSION

A cautious, secure, and efficient method for treating stained teeth is the inside/outside bleaching approach. When presented with this clinical circumstance, many operators would view it as the recommended course of action with little discomfort to the patient, the therapy goals are swiftly met. Comparing the method to invasive restorative procedures, it is incredibly cost-effective. Walking bleach along with restorative work aided this procedure for an excellent esthetic outcome.

REFERENCES:

[1] Poyser NJ, Kelleher MG, Briggs PF. Managing discoloured non-vital teeth: the inside/outside bleaching technique. *Dental update*. 2004 May 2;31(4):204-14.
 [2] Joan Enabulele, Mohammed Bi, Crown Discoloration as A Sequelae of Traumatic Dental Injuries *Dental Oral Biology and Craniofacial Research* 2019, 2613-4950
 [3] Dahl JE, Pallesen U. Tooth bleaching—a critical review of the biological aspects. *Critical Reviews in Oral Biology & Medicine*. 2003 Jul;14(4):292-304..
 [4] Maryam Khoroushi, Amineh Hasankhani and Hesam Mirmohammadi. Inside-Outside Bleaching of Endodontically Treated Teeth, *SL Dentistry, Oral Disorders And Therapy*. 2020;3(1):116
 [5] Patil AG, Hiremath V, Kumar RS, Sheetal A, Nagaral S. Bleaching of a non-vital

anterior tooth to remove the intrinsic discoloration. *Journal of Natural Science, Biology, and Medicine*. 2014 Jul;5(2):476.
 [6] Singh N, Chaturvedi TP, Baranwal HC, Wang CK. Management of discolored nonvital tooth by walking bleach technique: A conservative approach. *Journal of the International Clinical Dental Research Organization*. 2020 Jan 1;12(1):67.
 [7] Plotino G, Buono L, Grande NM, Pameijer CH, Somma F. Nonvital tooth bleaching: a review of the literature and clinical procedures. *Journal of endodontics*. 2008 Apr 1;34(4):394-407.
 [8] Debarun David, Pradeep S, Comparison of Different Types of Barriers Used in Non-Vital Bleaching: A Retrospective Study, *J Res Med Dent Sci*, 2022, 10 (6):198-202
 [9] Greenwall-Cohen J, Greenwall LH. The single discoloured tooth: vital and non-vital bleaching techniques. *British dental journal*. 2019 Jun;226(11):839-49.
 [10] REGISTER PL. The walking bleach technique is a popular choice among patients and clinicians for treating discolored endodontically treated teeth..
 [11] Keasberry J, Munyombwe T, Duggal M, Day PF. A study of factors that influence the number of visits following traumatic dental injuries. *British dental journal*. 2013 Jun 8;214(11):E28-.