

MANAGEMENT OF NON-VITAL TEETH WITH INTRINSIC STAINS USING INTERNAL BLEACHING TECHNIQUE

Hema.M*, Jayashankar C M, Sharth Kumar P, Savita B, Girish S A and Mujahid Ahmed

Sri Siddhartha Dental College Agalakote, B.H. Road, Tumakuru, Karnataka 572107

ARTICLE INFO

Article History:

Received 6th January, 2022

Received in revised form 15th

February, 2022

Accepted 12th March, 2022

Published online 28th April, 2022

Key words:

Non-vital teeth, Bleaching, Endodontically treated teeth, tooth discolouration.

ABSTRACT

The anterior Teeth as a sequelae of trauma may get intrinsically stained which has significant impact on esthetics and social wellbeing of a person. There are varied range of treatment available to treat the condition ranging from minimally invasive procedures like bleaching to invasive techniques like veneers and full crown. The treatment should cause minimal loss of tooth structure which enables better restorative options for the tooth. The advantage of tooth bleaching over crown is that it simple procedure which conserves maximum amount of tooth structure and brightens the tooth without damaging the tooth substrate.

Copyright©2022 Hema.M et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

With the modernizing era esthetics has become a prime concern for the people in the community and several factors influence the tooth both internally and externally.[1] Apart from established local and systemic variables, intrinsic discolouration of the tooth can be induced by trauma, loss of vitality, endodontic therapy, and restorative operations[2-4]. Poor teeth brushing procedures, smoking, a high-tannin diet, excessive use of chlorhexidine mouthwash, and/or metal salt ingestion cause extrinsic tooth stains[1.5]. Many treatments have been developed to manage the discoloured non-vital teeth. [6] When compared to placing restorations, the walking bleach approach is a successful and conservative treatment choice. [7-9] This method bleaches the inside of the tooth and brightens the tooth. We present 2 case report in which we employed this strategy to achieve better outcomes.

Case report

A 31-year-old male patient presented to the institution with a stained upper front tooth and expressed a wish to have the tooth treated [Figure 1]. The maxillary right central incisor tooth was structurally intact and solid upon inspection. Brown discolouration of the tooth was seen, and the vitality test was negative. As the tooth was non vital endodontic treatment was administered and was planned for walking bleach. The patient was informed about the bleaching technique and gave his approval for the bleaching therapy inside of his teeth to address discoloration. [10]

Procedure performed

After the endodontic treatment the 2 mm of cervical gutta percha was removed and the canal was sealed using GIC till the level of CEJ and then the mixture of sodium perborate and hydrogen peroxide was placed, the excess hydrogen peroxide was removed and the cavity was sealed with temporary restoration and patient was recalled after 1 week to check the progress of bleach and the following results were attained.

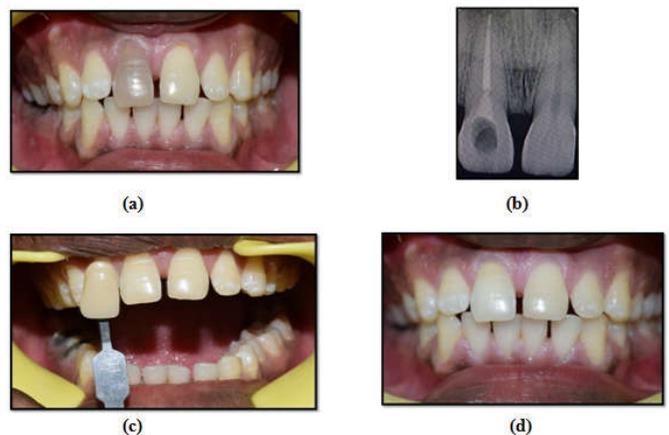


Figure 1 (a) Preoperative image showing discoloured right maxillary central incisor (b) radiograph taken showing the sealing of the cavity prior to placement of bleaching agent. (c) The brightened tooth showing improvement in the shade(A2) (d) Post-operative image.

*Corresponding author: Hema.M

Sri Siddhartha Dental College Agalakote, B.H. Road, Tumakuru, Karnataka 572107

Case 2

A 30 year old female patient presented to the institution with a stained upper front tooth and expressed a wish to have the tooth treated [Figure 6]. The maxillary left central incisor tooth was structurally intact and solid upon inspection. Brown discoloration of the tooth was seen, and the vitality test was negative. As the tooth was non vital endodontic treatment was administered and was planned for walking bleach. The patient was informed about the bleaching technique and gave her approval for the bleaching therapy inside of her teeth to address discoloration.

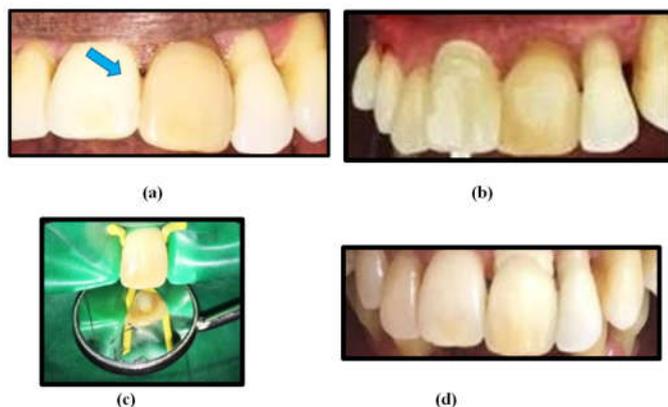


Figure 2 (a)Preoperative image (b) shade match of the discolored tooth (c4) (c) Placement of bleaching agent inside the tooth (d) final result of the procedure brightened tooth (Shade A2)

DISCUSSION

Different options are used in the treatment of discoloured endodontically treated anterior tooth. [6] In-office walking bleach has many advantages over the conventional options and is especially, useful in treating the crown and intrinsic discoloration of the tooth. The in-office bleach, which was used in this patient, is discussed here. For a tooth that had discolored following de-vitalization, bleaching is preferable to the crown placement when the tooth is relatively intact.[11] 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.[12]

A previous study reported no significant difference in the success rate achieved between anterior non-vital teeth with and without crowns.[13] Thus, supporting our view that endodontically treated anterior teeth do not require crowns.[14] Trabert *et al.* also concluded no appreciable difference in the resistance to fracture between untreated anterior teeth and endodontically treated anterior teeth. [12] Furthermore despite small proximal restorations, most pulp less anterior teeth with sound coronal tooth structure can be conservatively restored with the lingual composite restoration.[15] Interestingly, there was no advantage in reinforcement by cementing posts in endodontically treated anterior teeth.[16] In contrast placement of a dowel and crown in such a tooth is likely to weaken rather than strengthening it. For instance, intact endodontically treated anterior teeth with natural crowns demonstrate greater strength against fracture than teeth built-up with pin retained amalgam cores or cast gold dowel cores. Further central incisors were three times more resistant to fracture than the teeth, which were restored with dowel core and crowns.[17]

A laminate veneer may offer a less destructive alternative to the crown. It may mask the discoloration, but also may undergo fracture, debonding, and marginal leakage. However, it requires tooth preparation and is irreversible.[18] Considering the above reasons in-office walking bleach was planned on this patient and desirable results were achieved with patient satisfaction. The major advantage of this approach is (1) it is more conservative (2) more effective in stain removal and (3) significantly improves the appearance of tooth color. Hence, walking bleach should be the most commonly adapted method by the dentist as it provides complete control on the process throughout treatment. [19]

Moreover, walking bleach is usually a rapid process and the results are evident even after a single intervention. Nevertheless, many of the patients prefer this bleaching approach by the dental professional because it requires less active participation on their part. There is a risk of resorption reported but the reason for resorption of bleached teeth have not yet been successfully understood. It has been established that 30% hydrogen peroxide alone or in combination with sodium perborate are more cytotoxic for periodontal cells than perborate-water mixture [20]. Lado *et al* presumed that internal bleaching procedure leads to denaturation of dentin in the cervical region. This denatured dentin induces a foreign body reaction.[21] Hydrogen peroxide releases oxygen that breaks down conjugated bonds associated with the stains into a single bond, which in turn can be washed out with water and hence effectively removes the stains. This leads to more absorption of color wavelengths, resulting in tooth whitening effect. The use of light in bleaching had no demonstrable benefit over the chemically activated tooth whitening system.[22]

Heat application causes widening of dentinal tubules which may facilitate easier diffusion of HYDROGEN PEROXIDE to the periodontium [23]. Application of heat also results in formation of extremely reactive hydroxyl radicals from hydrogen peroxide which can degrade the connective tissue. Hence, we have refrained from heat activation of sodium perborate- hydrogen peroxide mixture in the presented case to avoid any possible complications. Montgomery showed that intra-coronal dressing can prevent progression of external cervical resorption [24]. Cervical resorption can be treated by direct restoration after gaining access via orthodontic extrusion or surgical way. Hence a barrier using glass ionomer cement was placed in a bobsled tunnel design to prevent resorption.

CONCLUSION

Non-vital bleaching is cost-effective, predictable, and rapid, with a pleasing aesthetic outcome. However, the endodontist's skill is essential to proceed with a suitable case selection and to avoid any post-procedural complications.

Reference

1. Watts A, Addy M. Tooth discoloration and staining: A review of the literature. *Br Dent J* 2001; 190:309-16.
2. Ten Bosch JJ, Coops JC. Tooth color and reflectance as related to lightscattering and enamel hardness. *J Dent Res* 1995; 74:374-80.
3. Walton RE, Torabinejad M. Principles and Practice of Endodontics. 3rd ed. USA: Saunders; 2002.
4. Wray A, Welbury R, Faculty of Dental Surgery, Royal College of Surgeons. UK National Clinical Guidelines

- in Paediatric Dentistry: Treatment of intrinsic discoloration in permanent anterior teeth in children and adolescents. *Int J Paediatr Dent* 2001; 11:309-15.
5. Nathoo SA. The chemistry and mechanisms of extrinsic and intrinsic discoloration. *J Am Dent Assoc* 1997; 128 Suppl:6S-10S.
 6. Leith R, Moore A, O'Connell AC. An effective bleaching technique for non-vital, discoloured teeth in children and adolescents. *J Ir Dent Assoc* 2009; 55:184-9.
 7. Nixon PJ, Gahan M, Robinson S, Chan MF. Conservative aesthetic techniques for discoloured teeth: 1. The use of bleaching. *SADJ* 2008;63:332, 334-7.
 8. Lee SS, Zhang W, Lee DH, Li Y. Tooth whitening in children and adolescents: A literature review. *Pediatr Dent* 2005; 27:362-8.
 9. Attin T, Paqué F, Ajam F, Lennon AM. Review of the current status of tooth whitening with the walking bleach technique. *Int Endod J* 2003; 36:313-29.
 10. Settembrini L, Gultz J, Kaim J, Scherer W. A technique for bleaching nonvital teeth: Inside/outside bleaching. *J Am Dent Assoc* 1997;128:1283-4.
 11. Standlee JP, Caputo AA, Hanson EC. Retention of endodontic dowels: Effects of cement, dowel length, diameter, and design. *J Prosthet Dent* 1978; 39:400-5.
 12. Trabert KC, Caputo AA, Abou-Rass M. Tooth fracture – A comparison of endodontic and restorative treatments. *J Endod* 1978; 4:341-5.
 13. Sorensen JA, Martinoff JT. Clinically significant factors in dowel design. *J Prosthet Dent* 1984; 52:28-35.
 14. Goerig AC, Mueninghoff LA. Management of the endodontically treated tooth. Part I: Concept for restorative designs. *J Prosthet Dent* 1983; 49:340-5.
 15. Guzy GE, Nicholls JI. In vitro comparison of intact endodontically treated teeth with and without endo-post reinforcement. *J Prosthet Dent* 1979; 42:39-44.
 16. Lovdahl PE, Nicholls JI. Pin-retained amalgam cores vs. cast-gold dowel-cores. *J Prosthet Dent* 1977;38:507-14.
 17. Bernard GN, Leslie C. Planning and Making Crown and Bridge Book. 4th ed. Informa Healthcare 2007. p. 3-29.
 18. Goldstein CE, Goldstein RE, Feinman RA, Garber DA. Bleaching vital teeth: State of the art. *Quintessence Int* 1989; 20:729-37.
 19. Boksman L. Current status of tooth whitening: Literature review. *Dent Today* 2006; 25:74, 76-9.
 20. Kinomoto Y, Carnes DL, Ebisu S. Cytotoxicity of intracanal bleaching agents on periodontal ligament cells in vitro. *J Endod*. 2001;27(9):574-577
 21. Lado EA, Stanley HR, Weisman MI. Cervical resorption in bleached teeth. *Oral Surg Oral Med Oral Pathol*. 1983;55(1):78-80.
 22. Kugel G, Papathanasiou A, Williams AJ 3rd, Anderson C, Ferreira S. Clinical evaluation of chemical and light-activated tooth whitening systems. *Compend Contin Educ Dent* 2006; 27:54-62.
 23. Rotstein I, Torek Y, Lewinstein I. Effect of bleaching time and temperature on the radicular penetration of hydrogen peroxide. *Endod Dent Traumatol*. 1991; 7(5):196-198.
 24. Montgomery S. External cervical resorption after bleaching a pulpless tooth. *Oral Surg Oral Med Oral Pathol*. 1984;57(2):203- 206.

How to cite this article:

Hema.M *et al* (2022) 'Management of Non-Vital Teeth with Intrinsic Stains Using Internal Bleaching Technique', *International Journal of Current Advanced Research*, 11(04), pp. 757-759.
DOI: <http://dx.doi.org/10.24327/ijcar.2022.759.0173>
