Case Report

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A clinical evaluation of tooth bleaching treatment using a dual-barrel in-office whitening system

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Abstract

Objective: This study aimed to evaluate the whitening effect and tooth sensitivity after bleaching treatments using iBrite in-office whitening system.

Methods: The clinical report accommodated 27 patients using the iBrite in-office whitening system for bleaching treatments. Prior to the procedure, patients were screened for eligibility and underwent basic tooth cleaning. Recorded data of before and after treatments including clinical images, VAS scales, and VITA scales were assessed. Follow-ups were completed three months and six months after the in-office treatment.

Results: After treated with iBrite in-office whitening systems, on average 6.3 shades of tooth color change were observed in 27 patients. In term of tooth sensitivity, male patients are more likely to feel sensitive after the treatments compared to the female patients. Most teeth sensitivity relieved in three to four days, and no other sensitivity was observed 6 months after the original in-office treatment.

Conclusion: The iBrite in-office whitening system provides a fast, comfortable and convenient tool for tooth whitening. The low-irritating, yet still professional-grade whitening effect makes it as an ideal tooth whitening system to use in the dental office.

Keywords: Bleaching, Hydrogen peroxide, Sensitivity, Tooth whitening

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Introduction

In modern dentistry, tooth whitening has become a frequently applied treatment.[1-4] A dazzling white tooth, particularly for the anterior zone are among the prominent concern for most people to acquire a beautiful smile.[5,6] Thus, the increased patient awareness on the smile apparent lead to the rise of aesthetics demand in dental market.[7-9]

Recently, various methods and techniques have been developed to comply with the needs for aesthetic tooth whitening.[10-12] The in-office bleaching technique using different concentrations of hydrogen peroxide, range from 15% to 40%, has been proved to be an effective whitening method.[13-15] Moreover, under appropriate conditions, dental bleaching is also considered as an easy and low-cost approach. However, the adverse effect of the increased tooth sensitivity after procedure remains as a major concern among the dentists.[16-18]

In order to provide better bleaching experiences to patients, it is crucial to find a treatment strategy which can effectively whiten the tooth with minimum drawbacks to the patients.[19] In this report, we introduce the iBrite in-office whitening system as a new strategy for tooth whitening. This system utilized a new dual- barrel technology, which mixes the activate ingredients right before each treatment. The dual-barrel technology maximizes the whitening effect with relatively low HP concentration, helping to reduce teeth sensitivity.

Case Report

This bleaching trial accommodated 27 patients with the iBrite in-office whitening system. The patients were from 17 years old to 63 years old. Before the tooth whitening procedure, patients were guided to have a comprehensive oral screening with medical, dental and social information was recorded. Table 1 and figure 1. The screening helped the clinician to assess patients' teeth condition and choose the suitable candidates for the whitening trial.

Patients were selected when the following criteria are met: (1) the patient had more than 20 real teeth, (2) was willing to cooperate with a dentist for the whitening treatment, (3) was willing to comply with the clinical process for related testing, (4) committed to follow-up office visits. Pregnant woman and patients with conditions like serious periodontitis, greater missing teeth, and wearing an orthodontic appliance were excluded from this trial.

All patients met the criteria agreed to participate in the trial with sign consent letters. The whitening procedures were performed on vital anterior teeth using the iBrite in-office whitening system (24% hydrogen peroxide, California, USA) by experienced dentists according to manufacturer's instruction figure 2. The clinical images of the targeted tooth were recorded before and after the procedures. In addition, tooth colors were assessed by VITA shade and visual analog scale (VAS) figure 3. Patients were instructed to return to the original dental offices three months and six months after the in-office treatments for

Table 1 **Test treatment procedure**

Test Procedure	Content	Treatment
Subject screening	Basic data filing Test description Participants sign the subject consent form	The physician conducted a trial to the subject indicating that the subject agreed to sign file the document
Pre-whitening test foundation Periodontal cleaning	Such as calculus removal	Basic cleaning of teeth before whitening treatment
Dental data collection during the test phase	Recording dental data before and after use	On the day of use, three months later, six months later records are required

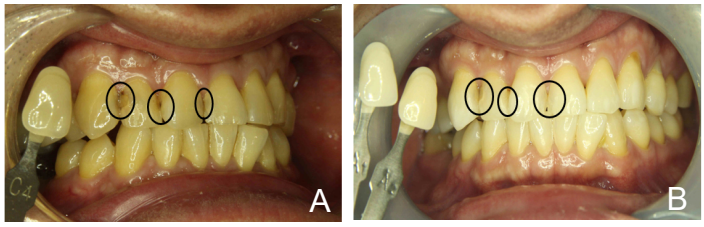

Figure 1 **Clinical view of patients screened with comprehensive oral examination, A. Before bleaching procedure, B. Restoration and bleaching treatments were completed**

Figure 2 **Clinical view of patients showing the steps of bleaching procedure using whiter image in-office whitening system, A. Patient 2 with gingival barrier in lower targeted teeth, B. Patient 3 with gingival barrier in upper and lower targeted teeth, C. Patient 4 with gingival barrier in upper and lower targeted teeth.**

postoperative follow-ups.

VITA color plate semi-quantitative score

The tooth color was semi-quantitatively recorded using the Vita Easyshade (Vident, Brea, CA, USA) at baseline and after whitening sessions. The shade changes of tooth color were recorded.

VAS tooth sensitivity scale

The patients were instructed to record the sensitivity levels immediately after the whitening procedure based on VAS scale. The VAS scale employs a 10-cm horizontal line with words "no pain" at one end and "worst pain" at the opposite end.

Patient evaluation and treatment outcome

After the bleaching treatment, color changes were recorded to evaluate the effect of the iBrite in-office whitening system. The results showed that there were color changes for all treated teeth (figure 4). Among 27 patients, an average overall change of 6.30 shade was observed. Postoperative follow-ups were done at the third month and the sixth month after the treatments. Patients showed satisfying responses to their teeth color. No specific complaints correlating to the aesthetic result were recorded.

For teeth sensitivity, there VAS score were recorded after the in-office treatments. Various degrees of sensitive were reported right after the treatments, among the 27 cases, an average overall change of 3.26 scores were observed, which were acceptable for most patients, and all sensitivity reduced to score 0 in 3 to 4 days.

Discussion

In this study, we reported an in-office tooth whitening trial using the iBrite in-office whitening system. Patients from adolescence to adult were included in order to perceive the potential to use this system on a complex case. Most patients in this study were pleased with the tooth whitening effects using hydrogen peroxide as the whitening method. The in-office hydrogen peroxide based bleaching technique is expected to provide a satisfactory whitening outcome.[20,21] This method was considered an effective method for patient and dentist in reducing the time treatment yet still provide an ideal color chang.[21]

In this report, the change of tooth color was evaluated with VITA color plate to obtain the semi-quantitative score. This technique is the standardized and commonly utilized method for tooth shade matching. Study from Koren et al.[22] also use the VITA color plate as an indicator for color change in different biological teeth structures.[22] Supporting this result, earlier study also found that as measuring the color change is clinically hard, utilizing a shade guide and a spectrophotometer could be the alternative method to make a comparison of color change after bleaching.[23] The greater the change in VITA score,means the more obvious the whitening effect.

In order to evaluate tooth sensitivity postoperatively, VAS tooth sensitivity scale was applied to the patients. The tooth sensitivity is considered as the adverse effect of bleaching treatment since the main component contained in whitening products will cause user discomfort.[15] In this report, we found that the sensitivity after bleaching procedure was very low. We only found a mild and reasonable pain on the tooth with spontaneous regression after 3 to 4 days. Our finding is in line with previously published study found that

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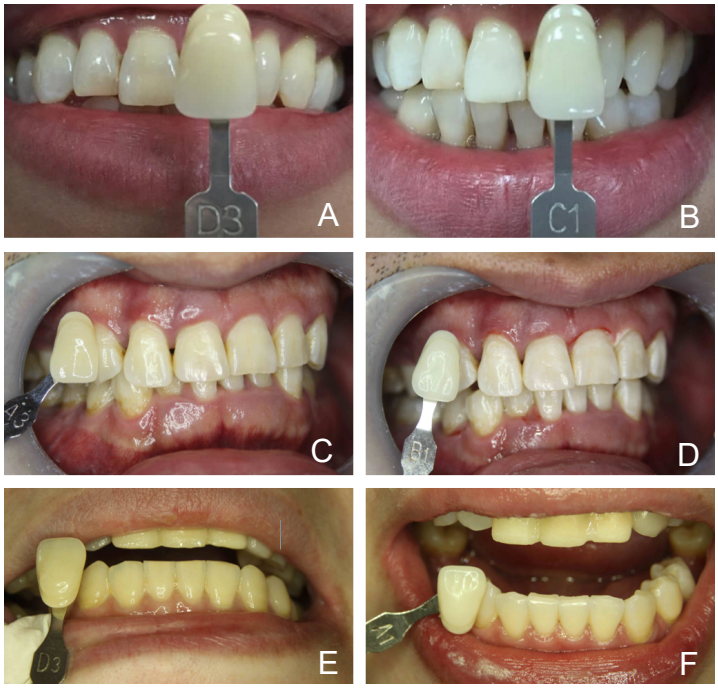

Figure 3 **Clinical view of patients using the VITA shade matching in targeted teeth before and after whitening treatment, A and B. Patient 5; VITA shade before D3 and Vita shade after C1, C and D. Patient 6; VITA shade before A3 and Vita shade after B1, E and F. Patient 7; VITA shade before D3 and Vita shade after A1**

Figure 3 **Clinical view of patients showing before and immediate postoperative phase of whitening treatment with iBrite in-office whitening system, A and B, Patient 8 with semi-quantitative score 9 to 7, C and D. Patient 9 with semi-quantitative score 19 to 13, E and F. Patient 10 with semi-quantitative score 18 to 12.**

after tooth whitening using a low concentration of hydrogen peroxide as tingling or shooting pain. The pain scores as low as 3 represents very moderate discomfort and readily tolerable.[24]

A clinical study conducted by Mondelli et al.[3] observed that time exposure and the concentration of the bleaching compound determines the tooth whitening endpoint.[3] The iBrite in-office whitening system used in this report has a relatively low hydrogen peroxide concentration, but achieved satisfying whitening effect. It reduced the degree of sensitivity and tooth or gum pain, which is a major concern in tooth whitening. Hence, this new system came up with a formula that reduces sensitivity without compromising results. In this study, we clearly demonstrated the success of whitening treatment based on the clinical data observed in the targeted teeth. Nevertheless, future clinical study with more patients and long-time follow-ups are needed.

Conclusion

The bleaching treatment using the iBrite in office whitening system presented in this report has demonstrated its efficacy and low sensitivity, indicating this method as an effective strategy to secure the maximum whitening effect with minimum complication. The iBrite in office whitening system is safe, powerful and effective to create extra-white smiles that can help to boost patients' confidence.

Aknowledgment

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Conflict of Interest

The authors report no conflict of interest.

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