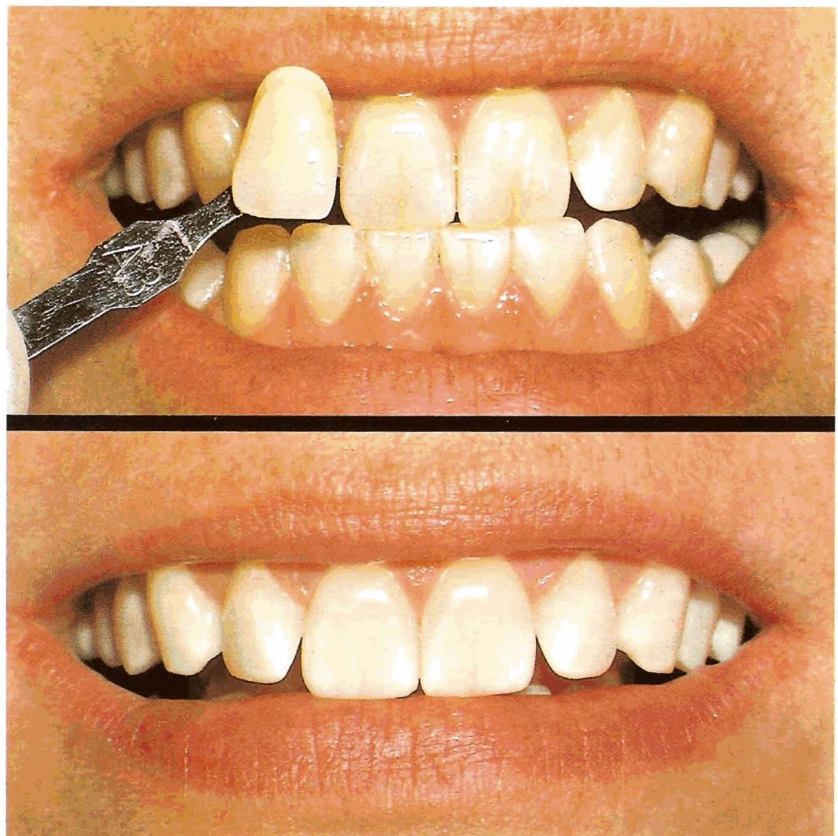


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Nightguard vital bleaching

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Introduction

With the current interest in esthetic dentistry, vital bleaching is a viable option to consider when treating intrinsically stained or discolored teeth whose form and integrity are deemed acceptable.^{1,2} This procedure has been reported by numerous authors.³⁻¹¹ The technique currently consists of acid etching the enamel with 37% phosphoric acid, and then bleaching the teeth by applying 30% hydrogen peroxide (H₂O₂) to the tooth surfaces, followed by the application of heat with either a heat lamp or a heating element.¹² The time required for effective bleaching is generally 20 to 30 minutes using the heat lamp, or approximately two minutes per tooth when using a heating element, although times vary with tooth sensitivity.¹² Other techniques advocate the superficial removal of enamel with abrasive instruments or pumice and may require additional caustic agents.¹³ All techniques require isolation with a heavy rubber dam and careful application and monitoring of the bleaching solution, because H₂O₂ is caustic.¹² When the etching process is incorporated into the bleaching technique, polishing the teeth subsequent to the treatment is usually required to restore a lustrous surface.² These variations in bleaching techniques typically involve a considerable amount of chair time (as many as six visits, each of approximately 45 minutes), at a potentially significant cost to the patient, and bleached teeth may regress in 2 to 3 years, requiring re-treatment.^{12,14}

Nightguard vital bleaching offers an apparently safe and effective means of bleaching mildly discolored teeth using a soft nightguard worn by the patient at night. The majority of the bleaching is accomplished outside the office, which provides significant savings of cost and time for the patient. The technique does not employ any preoperative acid etching of the enamel or any posttreatment polishing. No significantly caustic chemical agents are used, and only two short office visits are required to initiate treatment. Furthermore, under direction of the dentist, it can be resumed at any time, with only periodic supervision required, should any regression occur.

Method and materials

The current shade of the patient's teeth is determined with a standard shade guide. The patient should be involved in the selection of the correct shade so that he or she can verify and better appreciate subsequent improvements in color. Color photographs should be made for documentation, with the selected shade tab(s) positioned in the photographic field of view to provide a standard for future comparison (Figs 1 and 2). Because of the color variance that may exist between different shade guides, the same shade tab should be used in all subsequent photographs. Also, typically, one arch is treated at a time to preserve the opposing arch as a standard for later color comparison.

An alginate impression of the arch to be treated is made. From the resultant hydrocol cast, a vacuum-formed soft plastic nightguard, approximately 2-mm thick (similar to an athletic mouthguard) is fabricated. The nightguard should completely cover all the teeth in the arch, while leaving the palate and as much contiguous gingival tissue as possible uncovered (Fig 3). This design is recommended both for patient comfort and for minimizing potential injury to the soft tissue. Try-in of the nightguard to assess the accuracy of fit and to verify that no rough edges exist is recom-

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Fig 1 Before bleaching, the teeth are matched to a shade tab.



Fig 2 After bleaching, the same shade tab and the opposing arch serve as comparison standards for the degree of change.



Fig 3 The soft nightguard covers each tooth entirely, with only minimal soft tissue coverage.



Fig 4 Mild discoloration of teeth prior to bleaching treatment.



Fig 5 Results of bleaching after 5 weeks with 10% carbamide peroxide in a soft nightguard.

mended. Following initial try-in, the nightguard is adjusted with a slow-speed handpiece to ensure uniform distribution of occlusal contacts. Care must be taken not to perforate the nightguard.

A 1.2 oz tube of 10% carbamide peroxide is prescribed for, or given to, the patient. The patient is instructed to place 2 to 3 drops of the carbamide peroxide in the appropriate space in the nightguard corresponding to each tooth to be lightened.

Patient instructions are given to the patient in printed form:

1. At bedtime, brush and floss teeth, then rinse mouth well.
2. Place 2 to 3 drops of carbamide peroxide (Proxigel, Reed & Carnrick Pharmaceuticals) into the space in the nightguard for each tooth to be lightened.
3. Insert nightguard in mouth over teeth, and allow the excess material to extrude. Expectorate excess as necessary.
4. Wear the loaded nightguard during sleep every night until treatment is complete.
5. Clean and rinse nightguard each morning, and clean teeth as usual.

To document potential problems, patients initially treated in this manner were asked to record daily the total hours the nightguard was in place, as well as any perceived changes from normal in both their teeth and gingiva. A similar monitoring system is recommended to the practitioner to document any intraoral changes. The shade of the treated teeth should be evaluated periodically (2 weeks and 5 weeks are recommended recall times) to assess color change. Photographs are made at each recall with the original shade tab and the mandibular arch visible in the photographic field as a standard for contrast reference.

Results

The results of the example case are shown in Figs 4 and 5. A favorable result was attained for this patient in 5 weeks, with an average exposure time of 7¾ hours per night. Resolution of the yellow discoloration was equivalent to lightening the teeth approximately two shades, using the Vita shade guide (Unitek Corp) as a reference standard.

Transient problems documented by the patient included an initial tissue irritation after the first day, which was totally resolved by the third day. The patient also noted slight initial thermal sensitivity and

slight discomfort upon biting for the first hour immediately following removal of the nightguard. Again, these transient symptoms were mild, and did not appear after the second week. No pulpal problems were encountered, or expected, based on related studies.

Discussion

No long-term detrimental effects upon the teeth or gingiva have been observed with this bleaching technique. The reported case is typical of cases treated in this manner. Subsequent patients also report either no sequelae or only mild transient discomfort. No long-term deleterious effects have been observed to date. There have been no patient reports of significant tissue problems, odor, or bad taste associated with the procedure. Patients usually report a fresh taste in their mouth in the morning and frequently note a "squeaky clean" feel to their teeth.

Among bleaching media to date, Proxigel (a carbamide peroxide) appears to produce the best results, which may be because it is more acidic than comparable products.

The average time observed for optimal change is 6 weeks, although slight initial effects may be noted as early as 2 weeks. The duration of the esthetic result is unknown at this time, but appears to exceed at least 1 year. Because of the ease of treatment, the teeth can be re-treated as needed. The mandibular arch may subsequently be treated in a similar manner if so desired.

Predictability of success and indications for optimal results are unknown at this time. As with other vital bleaching techniques, this procedure appears to be most effective when treating yellow, orange, or slightly brown teeth, such as those darkened by aging or mild tetracycline staining.⁵ Darker gray, blue, and/or dark brown stains do not respond as well, although some lightening can be achieved, especially in the incisal one half.

Conclusions

Nightguard vital bleaching offers a conservative, viable alternative to conventional vital bleaching techniques and should be considered the first choice of treatment options for mildly discolored teeth. Although no long-term clinical results have been reported to date, a clinical study further evaluating nightguard vital bleaching is currently underway at

the University of North Carolina to determine the specific short- and long-term clinical effects of this procedure.

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