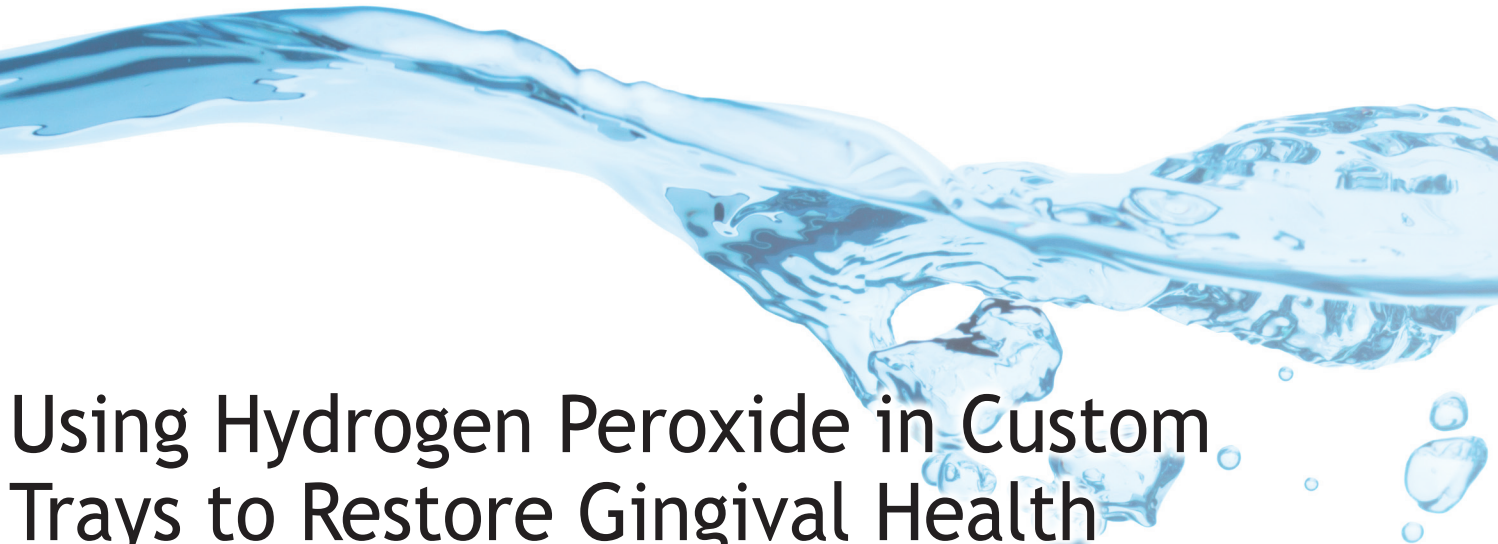


"A view from the other side"
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Using Hydrogen Peroxide in Custom Trays to Restore Gingival Health

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Periodontal disease has become an epidemic in the United States, with one of every two adults over 30 having either gingivitis or periodontitis.¹ Periodontal disease results from bacteria inhabiting the gingival and/or periodontal tissues that initiate a series of destructive inflammatory and immunologic changes.² Among the destructive agents in the initiation and progression of periodontal disease are bacterial plaque and calculus.³

Periodontal disease requires reactionary treatment to eradicate the bacteria, break down and loosen the dental plaque and calculus, and tighten the gingival tissues, followed by subsequent and on-going preventive measures to ensure periodontal health. Conventional treatments include mechanical removal of the subgingival biofilm and hard deposits (e.g., calculus and dental plaque) through scaling and root planing.^{4,5} Adhesive, antiseptic, and anti-inflammatory chemotherapeutic treatments (e.g., delmopinol hydrochloride, oral rinses, chlorhexidine, octenidine, denitrifies containing triclosan, copolymer, and sodium fluoride, etc.) compensate for the difficulties in accessing hard-to-reach-areas and lack of regular mechanical plaque removal.⁶

While mechanical and chemotherapeutic treatments are effective and beneficial, the cost, side effects, and chairtime requirements may not be advantageous for all patients with varying financial means and oral health circumstances. A new treatment is necessary for patients so periodontal disease can effectively and affordably be treated, and so they can best maintain their oral and periodontal health on an ongoing basis.

Hydrogen Peroxide and Periodontal Treatment

Although 3% hydrogen peroxide is generally associated with tooth whitening, hydrogen peroxide was originally used as an oral antiseptic for improving gingival health.⁷ Hydrogen peroxide has been shown to break down and loosen dental plaque and calculus,⁸⁻¹⁰ and a study found that daily use of hydrogen peroxide whitening strips reduced calculus formation up to 29% versus regular brushing.¹¹

Besides plaque and calculus breakdown, hydrogen peroxide has also been shown to tighten and clean gingival tissues, and significantly reduce bleeding on probing and Plaque and Gingival Index scores.^{10,12} Hydrogen peroxide kills and eliminates some bacteria in the gingival sulcus by releasing oxygen when contacting the tissues, resulting in pathogenic effects on gram-positive and gram-negative organisms that greatly reduces or eradicates pathogens in acute necrotizing periodontal disease and improves gingival tissue health.^{9,13}

However, a problem has been administering hydrogen peroxide into the periodontal pocket and keeping it in contact with the tissues long enough for it to work.¹⁴ Fortunately, local administration of 3% hydrogen peroxide gel using customized, in-office fabricated trays, enables the hydrogen peroxide to penetrate into deeper pockets, improve pocket depths and bleeding on probing compared to scaling and root planing alone, and break down plaque and calculus.^{4,15}



Figure 1: Although the rough calculus surface does not induce inflammation of the adjacent periodontal tissues itself, it functions as the ideal substrate for subgingival microbial colonization.



Figure 2: Fabrication of tray created in the dental practice laboratory.



Figure 3: Delivery of fabricated trays with instructions to wear the SDI hydrogen peroxide 3% overnight for 21 days.



Figure 4: Patient post-op check after 21 days and fine scaling performed.

Suggested Protocol for Hydrogen Peroxide Treatment

A recommended standardized and accessible hydrogen peroxide treatment protocol would enable delivery of hydrogen peroxide directly to the tissues in a safe, effective, affordable, and easy-to-use system.

1. During the initial evaluation and examination, perform preliminary intervention ranging from gross debridement to scaling and root planing, conduct periodontal charting (i.e., bleeding score, pocket depths, clinical attachment levels), and take a relevant medical history, dental history, and radiographs.
2. Evaluate whether or not the patient is a candidate for at-home hydrogen peroxide therapy (e.g., elderly patients having trouble maintaining basic oral hygiene; patients who are biologically, genetically, and/or medically compromised and/or predisposed to periodontal disease; and patients showing inflammation and poor pocket depth).



Select a 3% hydrogen peroxide gel, such as Poladay, to achieve the benefits of oxygen therapy without burning the patient's mouth or gingiva.



Figure 5: Patient returns two weeks later for post-op visit. Patient not only feels their teeth are cleaner, but whiter.



Figure 6: Close up of maxillary anterior tissue at two week post-op.



Figure 7: Close up of mandibular anterior tissue at two week post-op.

3. Take detailed and accurate impressions for well-fitted custom trays. Unlike whitening trays, do not cut the papilla out of the tray; the hygienist should provide specific instructions for modifying the trays for periodontal hydrogen peroxide therapy, depending on the patient's case (e.g., cutting the tray 2 mm above the tissue; specific tray measurements at tooth sites with unacceptable pocket depths and bleeding scores for directing the dental assistant in modifying the trays to more appropriately administer the hydrogen peroxide solution into the sulcus).

4. Select a 3% hydrogen peroxide gel (Poladay, SDI, www.sdi.com) to achieve the benefits of oxygen therapy without burning the patient's mouth or gingiva.

5. Delivery the trays and 3% hydrogen peroxide gel (Poladay, SDI, www.sdi.com) to the patient, being sure to demonstrate how to properly load the tray with the 3% hydrogen peroxide and seat the tray(s) in the mouth. Instruct the patient to actually perform this task while still in the chair to ensure their understanding of tray and hydrogen peroxide use, as well as proper removal and hygiene afterwards.

6. Explain the proposed treatment regimen, which could be wearing the tray(s) loaded with an application of 3% hydrogen peroxide gel overnight for 21 days.

7. Prior to dismissing the patient, schedule a follow-up appointment for 22 days later, at which time the hygienist can examine the patient and perform fine debridement and follow-up periodontal charting. Significantly weakened calculus, loosened dental plaque, healthier gingiva, and pocket depth improvement should be observed.

Conclusion

Although there are many therapies for treating periodontal disease, hydrogen peroxide has been shown to break down dental plaque and calculus, clean gingival tissues, and eliminate bacteria. Using custom-fit, in-office fabricated trays and 3% hydrogen peroxide, patients can receive personalized, more convenient, proven effective, and significantly more affordable treatment to ensure improved oral health.

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