Photodisinfection: A Case Report

By Catherine Fairfield, RDH

Periowave™ is a locally delivered antimicrobial which utilizes the technology of Photodynamic Disinfection or Photodisinfection. Photodisinfection is a simple two-step clinical procedure which causes cell destruction of targeted Gram-negative anaerobic microorganisms in a selected periodontal defect within 60 seconds. The first step involves irrigation of the affected periodontal site with a photosensitizing solution which selectively binds to the periodontal pathogens, while avoiding human tissue cells. The second step is illumination of this site with the light diffracting tip from a non-thermal diode laser of appropriate wavelength (670 nm) for a period of 60 seconds. Periowave™ photodisinfection has been shown to be effective against a wide range of perio-pathogens, including Porphyromonas gingivalis, Prevotella intermedia, Tannemella forsythia, Fusobacterium nucleatum, and Actinobacillus actinomycetemcomitans. Virulence factors associated with Gram-negative bacteria are also inactivated.

The following is a case report utilizing photodisinfection with Periowave™ for treatment of chronic periodontitis in an isolated periodontal defect.

Case Report

A 56-year-old male was referred to the periodontist for a generalized periodontal assessment and treatment as required. He was in good general physical health with no known allergies and reported long-term smoking in moderate amounts. Prior dental hygiene care at his general dental office had shown no improvement in his periodontal condition.

Clinical evaluation consisted of a full periodontal and radiographic examination that revealed generalized chronic periodontitis. Probing depths (PD) ranged from 2 – 9 mm. The gingival tissue presented with generalized edema and isolated cyanosis and the appearance of a thickened soft tissue biotype consistent with smoking. Bleeding on probing was noted generalized throughout the dentition. Radiographic examination revealed both vertical and horizontal osseous defects. Initial treatment was recommended to consist of four visits of SRP with local anesthesia in addition to local photodisinfection using Periowave™ in isolated sites.

On August 3, 2006, the patient presented for OHI and initial SRP, with local anesthesia for the upper right quadrant. (Figure 1.1) The maxillary right cuspid probing depths were 7 mm with BOP from the disto-buccal and 9 mm with BOP from the disto-palatal. Ultrasonic and hand scaling were performed followed by photodisinfection with Periowave™.

On August 21, 2006, the patient underwent SRP and photodisinfection with Periowave™ on the lower left quadrant. At this time, it was noted that PD for the maxillary right cuspid had reduced to 5 mm on the disto-buccal and 6 mm on the disto-palatal with elimination of BOP for both sites. (Figure 1.2) Re-treatment with Periowave™ for the distal aspects of the maxillary right cuspid was also provided. (Figures 1.3 and 1.4) Periodontal treatment was not completed due to employment changes for the patient.

Discussion

Upon initial examination, it appeared that the periodontal status of this patient had shown no improvement despite previous regularly scheduled hygiene maintenance therapy. The clinical findings were consistent with long term smoking and lack of proper home care. The simultaneous treatment of SRP and photodisinfection with Periowave™ was suggested as a means to reduce or eliminate residual periodontal pathogens in the affected sites with the intention of providing optimal clinical results. It was recommended to retreat this maxillary cuspid to aid with continued healing as the PD remained > than 3 mm. Although the precise etiology of this periodontal lesion remains unknown, the adjunctive use of photodisinfection appears to have been instrumental in reducing the PD from 9 mm to 6 mm and 7 mm to 5 mm with elimination of BOP in a smoker within only eighteen days.

References


Catherine Fairfield, RDH, graduated from the dental hygiene program at the University of Alberta in 1989. She has 18 years of experience in private periodontal practices in Calgary, Alberta, and is currently practicing in both periodontal and prosthodontic disciplines. For the past five years, she has been a part-time clinical educator and guest lecturer in the graduate periodontal program at the University of British Columbia. She provides educational seminars in non-surgical periodontal therapy, adjunctive therapies for the treatment of periodontal diseases, dental implant maintenance therapy, and hands-on advanced instrumentation workshops. A seasoned lecturer, Catherine has presented at national and provincial dental and dental hygiene conferences as well as at study groups and private practices across Canada. She is a member of the Competence Committee for the College of Registered Dental Hygienists of Alberta. Catherine can be contacted at 403-257-9771 or catherinefairfield@gmail.com.