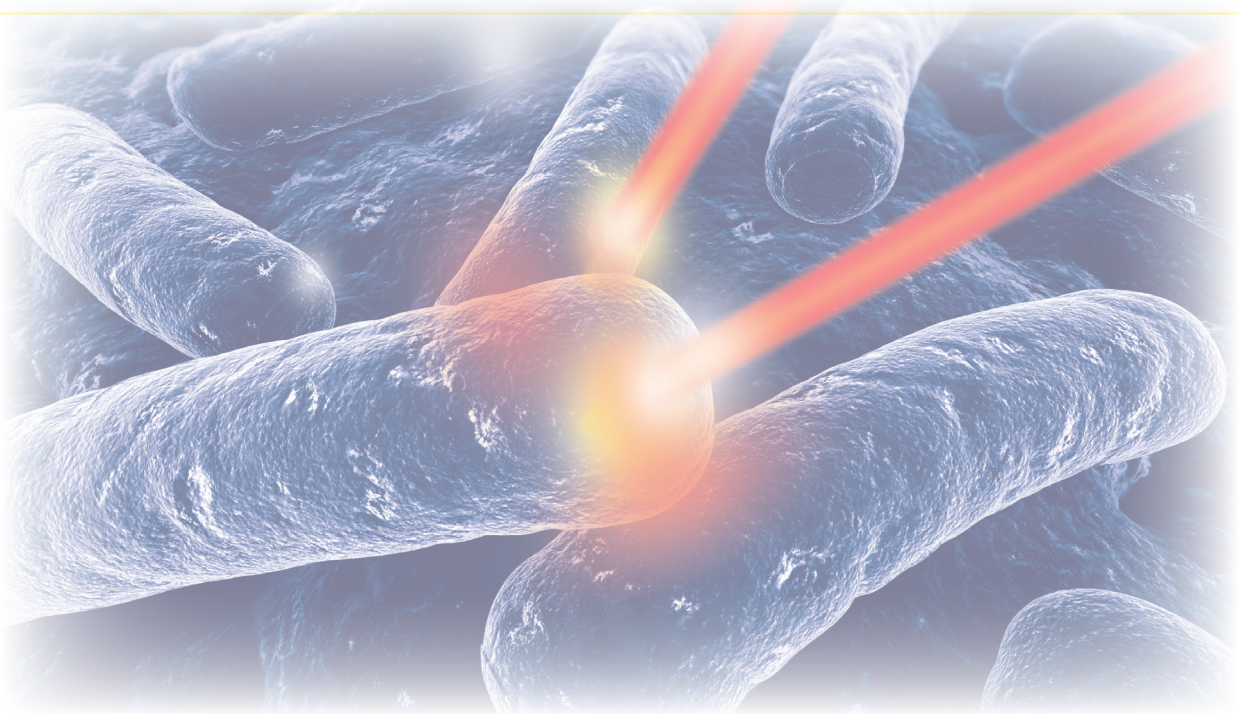


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HELBO-Therapie

**The most important scientific publications –
Abstracts**

Field of periodontology, repeated use of aPDT adjunctive to cleaning, double-blind study

[Bern University, CH](#)

One-year outcomes of repeated adjunctive photodynamic therapy during periodontal maintenance:
a proof-of-principle randomized controlled clinical trial

Authors:

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Institutes:

¹ Prince Philip Dental Hospital, The University of Hong Kong, Hong Kong, China

² School of Dental Medicine, University of Bern, Bern, Switzerland

³ School of Medicine and Oral Health, Griffith University, Gold Coast, Qld, Australia

Published:

J Clin Periodontol 2009; 36

Abstract: *

BACKGROUND: Single photodynamic therapy (PDT) has been effective in initial periodontal therapy, but only improved bleeding on probing (BoP) in maintenance patients after a single use. Repeated PDT has not been addressed.

OBJECTIVES: To study the possible added benefits of repeated adjunctive PDT to conventional treatment of residual pockets in patients enrolled in periodontal maintenance.

MATERIAL AND METHODS: Ten maintenance patients with 70 residual pockets [probing pocket depth (PPD) ≥ 5 mm] were randomly assigned for treatment five times in 2 weeks (Days 0, 1, 2, 7, 14) with PDT (test) or non-activated laser (control) following debridement. The primary outcome variable was PPD, and the secondary variables were clinical attachment level (CAL) and BoP. These were assessed at 3, 6 and 12 months following the interventions.

RESULTS: Greater PPD reductions were observed in the test (-0.67 ± 0.34 ; $p=0.01$) compared with the control patients (-0.04 ± 0.33 ; NS) after 6 months. Significant CAL gain ($+0.52 \pm 0.31$; $p=0.01$) was noted for the test, but not in the control (-0.27 ± 0.52 ; NS) patients after 6 months. BoP percentages decreased significantly in test (97–64 %, 67 %, 77 %), but not control patients after 3, 6 and 12 months.

CONCLUSIONS: Repeated (five times) PDT adjunctive to debridement yielded improved clinical outcomes in residual pockets in maintenance patients. The effects were best documented after 6 months.

* Original language English



Alleviation of pain and improved wound healing using low-level laser therapy, simple-blind study

[Vienna University, A](#)

Alleviation of pain using individual irradiation with a low-level laser light in the context of maxillo-orthopaedic multiband treatment

Authors:

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Institutes:

¹ Department for Maxillofacial Surgery, Medical University of Vienna, Austria

² Department for Maxillo-Orthopaedics, Medical University of Vienna, Austria

³ Department for Medical Statistics, Medical University of Vienna, Austria

Published:

IOK, March 2008; 40

Abstract: *

INTRODUCTION: The objective of this study was to analyze the effect of [single low-level laser therapy \(LLLT\)](#) irradiation on pain perception in patients having fixed appliance treatment.

Methods: [Seventy-six patients](#) (46 women, 30 men; mean age, 23.1 years) enrolled in this [single-blind](#) study were assigned to 2 groups. The patients in group1 (G1; 38 patients, 13 men, 25 women; mean age, 25.1 years) received a single course of LLLT (Mini Laser 2075, [Helbo Photodynamic Systems](#) GmbH & Co KG, Linz, Austria; wavelength 670nm, power output 75mW) for 30 seconds per banded tooth. The patients in group2 (G2; 38 patients, 17 men, 21 women; mean age, 21.0 years) received placebo laser therapy without active laser irradiation. Pain perception was evaluated at 6, 30, and 54 hours after LLLT by self-rating with a standardized questionnaire.

RESULTS: Major differences in pain perception were found between the 2 groups. The number of patients reporting pain after 6 hours was significantly lower in G1 (n = 14) than in G2 (n = 29) ($P < 0.05$), and the differences persisted after 30 hours (G1, n=22; G2, n=33) ($p < 0.05$). After 54 hours, no significant differences were seen between the number of patients reporting pain (G, n=20; G2, n=25), although the women had a different prevalence between G1 (n=11) and G2 (n=15) ($P=0.079$). After 6, 30, and 54 hours, more than 90% of the subjects in both groups described the pain as "tearing".

CONCLUSIONS: [LLLT immediately after multibanding reduced the prevalence of pain perception after 6 and 30 hours](#). LLLT might have positive effects in orthodontic patients not only immediately after multibanding, but also for preventing pain during treatment.

* Original language English

Alveolar osteitis / Post-extraction pain

[Vienna University, A & Cologne University, D](#)

Antimicrobial photodynamic therapy for the prevention of alveolar osteitis and post-extraction pain

Authors:

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Institutes:

¹ Department and Outpatient Department for Dental Surgery and Maxillofacial and Plastic Facial Surgery, University of Cologne, Germany

² Outpatient Centre of the Regional Medical Insurance Company Vienna, Austria

Published:

Journal for Maxillofacial Surgery 6/2004

Abstract: *

QUESTION: Alveolar osteitis occurs in 3–25% of cases after tooth extraction. Antimicrobial photodynamic treatment (aPDT) using HELBO® Blue and TheraLite lasers enables local decontamination of the extraction alveolus. The study should show whether aPDT using HELBO®Blue and Softlaser can avoid the development of alveolar osteitis.

MATERIALS AND METHODS: In an intraindividual study on 100 patients, one or more teeth were removed contralaterally from 130 jaws at 1 week intervals. One group was treated with aPDT with a standardised therapy plan and one without, in a randomised manner. An assessment of the extraction alveoli was carried out by the doctor treating the patient in the follow-up check.

The patient described the postoperative pain perception using an analogue scale (0–100).

RESULTS: In the group with aPDT, one case of alveolar osteitis occurred following extraction, in the control group without aPDT, it occurred in 13 cases. The subjective pain assessment 1 day after tooth extraction was stated as 11.2 ± 9.8 in the aPDT group and 19.0 ± 2.2 in the control group. One week after the extraction, the values in the aPDT group were 2.4 ± 9.2 , and 13.1 ± 25.2 in the control group. The difference of $p=0.000$ was significantly lower for the first and eighth postoperative day in the aPDT group.

CONCLUSION: On the basis of the significantly lower occurrence of alveolar osteitis following antimicrobial photodynamic therapy, this appears to be a new and very promising approach to the prevention of alveolar osteitis.

* Original language German



Multiple application possibilities of aPDT

[Cologne University, D](#)

Successful decontamination – even of chronic orally-manifested infections with the antimicrobial photodynamic therapy (aPDT) following the Helbo procedure

Authors:

Jörg Neugebauer, Viktor E. Karapetian, Thea Lingohr, J. Mauricio Herrera, Michael Schnickmann, Martin Scheer, Joachim E. Zöller

Institute:

Department and Outpatient Department for Dental Surgery and Maxillofacial and Plastic Facial Surgery, University of Cologne, Germany

Published:

LaserZahnheilkunde 2008; 1/08: 27-38

Abstract: *

Orally-manifested infections most frequently become apparent to the dentist in the context of [periodontopathies](#). Peri-implantitis is also occurring with increasing frequency, however it is not attributed to an increased risk posed by the implant, but rather is associated with an increased treatment rate.

Surgical colleagues state [alveolar osteitis](#) following tooth extraction as the most frequent disturbance to wound healing, whereby additional disturbances to wound healing, dependent upon the surgical technique and patient-specific risk factors, must also be treated. This also includes [disinfection of the resection cavities during root tip resection or of the apex](#) during conventional endodontic treatment. [By staining the bacteria with a thiazide dye and subsequent activation of this photosensitiser using a low-level laser, the antimicrobial photodynamic therapy enables local disinfection of these oral infections with no side effects.](#) The [various treatment options are explained in this article, together with the specific procedures.](#)

*** Original language German**

Bisphosphonate-associated osteonecrosis

[Munich University, D](#)

Low-level laser therapy (LLLT). A new possible approach to chronic disturbances to wound healing and bisphosphonate-associated osteonecrosis of the jaw region

Authors:

S. Hafner, S. Otto

Institute:

Department and Outpatient Department for Maxillofacial Surgery, Ludwig-Maximilians University, Munich, Germany

Published:

Wissen kompakt, 02/2009

Abstract: *

Low-level laser therapy (LLLT) for the promotion of wound healing and [photodynamic therapy \(PDT\)](#) for pathogen decontamination are new possible adjuvant therapy approaches to chronic disturbances to wound healing and bisphosphonate osteonecrosis in the maxillary region (BRONJ). Successful therapy, however, is usually only to be expected by combining this with surgical measures.

* Original language German



Aggressive periodontitis, aPDT without cleaning

[University of Sao Paulo, Brazil](#)

Antimicrobial Photodynamic Therapy in the Non-Surgical Treatment of Aggressive Periodontitis: A Preliminary Randomised Controlled Clinical Study

Authors:

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Institute:

Department of Bucco-Maxillo-Facial Surgery and Traumatology and Periodontology, School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão, SP, Brazil

Published:

Journal of Periodontology, Juni 2007 No. 6.

Abstract: *

Background: The treatment of aggressive periodontitis has always presented a challenge for clinicians, but there are no established protocols and guidelines for the efficient control of the disease.

Methods: **Ten patients** with a clinical diagnosis of **aggressive periodontitis** were treated in a **split-mouth design** study to either photodynamic therapy (PDT) using a laser source with a wavelength of 690 nm associated with a phenothiazine photosensitiser or **scaling and root planing** (SRP) with hand instruments. Clinical assessment of plaque index (PI), gingival index (GI), bleeding on probing (BOP), probing depth (PD), gingival recession (GR), and relative clinical attachment level (RCAL) were made at baseline and 3 months after treatment with an automated periodontal probe.

Results: Initially, the PI was 1.0 ± 0.5 in both groups. At the 3-month evaluation, the plaque scores were reduced and remained low throughout the study. A significant reduction of GI and BOP occurred in both groups after 3 months ($P < 0.05$). The mean PD decreased in the PDT group from 4.92 ± 1.61 mm at baseline to 3.49 ± 0.98 mm after 3 months ($P < 0.05$) and in SRP group from 4.92 ± 1.14 mm at baseline to 3.98 ± 1.76 mm after 3 months ($P < 0.05$). The mean RCAL decreased in the PDT group from 9.93 ± 2.10 mm at baseline to 8.74 ± 2.12 mm after 3 months ($P < 0.05$), and in the SRP group, from 10.53 ± 2.30 mm at baseline to 9.01 ± 3.05 mm after 3 months.

Conclusion: **PDT and SRP showed similar clinical results in the non-surgical treatment of aggressive periodontitis.**

Comments:

In this study, the effect of HELBO therapy on its own was compared with the effect of scaling and root planing. Both treatments produced statistically equal results. The effect of HELBO therapy is therefore proven. In clinical use, HELBO therapy should be combined with scaling and root planing to achieve the best results.

* Original language English

Periodontology, comparison of various laser systems from the USA, Germany, and also thermal lasers (Hardlasers)

Clinical and Microbiological Study of Laser-assisted Periodontal Therapy

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Institutes:

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² University of Frankfurt, Dept. of Oral Surgery/Implantology, Frankfurt, Germany

³ Eastman Dental Center, Division of Periodontology, University of Rochester New York, USA

Published:

IADR, September 26-29. 2007, Thessaloniki, Greece

Abstract: *

INTRODUCTION: The scientific and clinical discussion in the last few years has been focused on laser systems as an assisted method in periodontal therapy.

PURPOSE: The aim of this clinical and microbiological study was to investigate the influence of various laser wavelengths on the periodontal bacterial spectrum as well as changes in clinical parameters in patients with chronic periodontitis.

MATERIAL AND METHODS: Four methods were used to treat the periodontitis. SRP (control group), SRP + diode laser (980nm), SRP + Nd: YAG- laser (1064nm) and SRP and photodynamic therapy (PDT, 670nm). Ten patients with a total of 253 periodontal pockets were treated over a period of three months. A total of 325 microbiological samples were taken (figs.1,2) and evaluated (PCR) over the complete period of the study (before treatment, on the third and seventh day thereafter, after one and after three months). The bleeding index (BOP) was measured before treatment, after one and after three months period. For each patient a treatment method was assigned randomly by quadrants, so that in any one patient one quadrant was treated Nd:YAG laser-assisted, one quadrant diode laser-assisted, one quadrant PDT-assisted and one quadrant by SRP alone. Treatment was conducted with a power setting of 2 W, cw (fig. 3) and 75 mW in the case of PDT (figs. 4,5) for 20 seconds irradiation period.

RESULTS: Regarding bleeding on probing, the sites of the control group showed more bleeding compared to laser irradiated sites after three months (fig. 12). The average bacteria reduction of all bacteria investigated after treatment by SRP + PDT was the best: 87.57 % (p<0.001) on the third day, 83.74 % (p<0.05) on the seventh day, 80.11 % (p<0.05) after one month and 91.37 % (p<0.05) after a three month period (figs. 8-11).

CONCLUSION: This study shows that periodontal therapy assisted by PDT can offer an alternative method in the initial phase of periodontal therapy. In comparison to SRP alone and SRP assisted by high-intensity laser, PDT is able to control BOP and achieves the best results in bacterial reduction.

* Original language English



Periimplantitis

[Cologne University, D](#)

Initial Therapy of Peri-implantitis by Anti-microbial Photodynamic Therapy

Authors:

Philipp Scherer, Jörg Neugebauer, Viktor E. Karapetian, Freimut Vizethum, Joachim E. Zöller

Institute:

Department and Outpatient Department for Dental Surgery and Maxillofacial and Plastic Facial Surgery, University of Cologne, Germany

Published:

ADI, 3-5 May 2007, Birmingham, UK

Abstract: *

INTRODUCTION: The microbiological infection of the peri-implant tissue is still one of the most difficult implant complications today. Due to scar formation of the soft-tissue the infection defence mechanisms are reduced in comparison to periodontal tissue. The implant surface with a rough structure, once exposed to oral cavity offers an ideal environment for bacterial growth. The microbiological load and the clinical symptoms are comparable to periodontal disease. The anti-microbial photodynamic treatment shows high levels of antimicrobial reduction for all relevant bacterial strains.

MATERIAL AND METHODS: From 2003 till 2006, during regular implant recall, 25 patients showed clinical signs of peri-implantitis including bleeding on probing. The initial treatment concept included hygienic instruction, supragingival cleaning and determination of mechanical reasons. 5 patients received the implant treatment after cancer rehabilitation with skin graft and suffered on super infection with Candida albicans. After the mechanical cleaning for all patients a phenothiazin based photosensitizer (HELBO®Blue, HELBO, Grieskirchen, Austria) was applied into the pocket and at the skin graft left for one minute. Then the dye was rinsed with water and activation of the photosensitizer was performed with non-thermal laser light of 660nm for one minute for each area following the recommended protocol. The photodynamic reaction leads to a singlet oxidation at the membrane of the bacteria and performs a selective cell death. In the osseoseparation group vertical bone defects were augmented after 3 to 5 days with additional local photodynamic treatment of the surgical site.

RESULTS: The anti-microbial photodynamic treatment offers a bacteria reduction without administering local anaesthesia and can be repeated without any side effects. This non-invasive method allows an early treatment of peri-implantitis prior to radiological signs of bone loss. In severe cases like superinfection by candida albicans multiple appointments are necessary. The initial treatment allows a nearly complete regression at an early stage. In late cases of peri-implantitis a recovery is possible for over 80% of the infected implants.

* Original language English

Implantation in extraction alveoli

[Cologne University, D](#)

Title:

Initial Results for Adjunctive Treatment with aPDT on Immediate Placed Implants in Periodontal Compromised Patients

Authors:

Priv.-Doz. Dr. Jörg Neugebauer ^{1,2}, MSc Dr. Franziska Möller ¹, MSc Dr. Frank Kistler ²,
Dr. Steffen Kistler ², Dr. Dr. Martin Scheer ¹, Priv.-Doz. Dr. Dr. Daniel Rothamel ¹, Dr. Georg Bayer ²,
Prof. Dr. Dr. Joachim E. Zöller ¹ Cologne University

Institutes:

¹ Department and Outpatient Department for Dental Surgery and Maxillofacial and Plastic Facial Surgery, University of Cologne, Germany

² Private Dental Hospital, Landsberg am Lech, Germany

Abstract: *

AIM OF STUDY: The aim of this study is to evaluate the effectiveness of aPDT on the success and complication rate of [immediate extraction](#) and restored implant sites.

MATERIALS AND METHODS: Between 2005 and 2010 a total number of 102 patients were treated and received 92 restorations in the mandible and 23 in the maxilla with a total number of 509 implants:

- [147 implants \(control\)](#) were placed in fresh [extractions sockets](#) without any adjunctive procedure.
- [67 implant \(aPDT\)](#) sites were prepared after the photodynamic therapy was applied for infection control at the [extraction socket](#).

RESULTS: [2 out of 147 implants](#) failed and showed no [osseointegration](#) at the time of impression taking. Another [10 implants](#) showed signs of [retrograde peri-implantitis](#) or peri-implant [sequester](#) resulting in a [complication rate of 8.1%](#) in the control group.

Two implants with retrograde peri-implantitis could be treated with systemic antibiotic therapy; one additional required a surgical procedure. 7 implants required a surgical revision to remove sequester.

In the [aPDT-group all implants](#) reached [osseointegration](#) at the time of impression taking and only [one implant](#) showed [peri-implant sequester \(1.5% complication rate\)](#). No signs for retrograde peri-implantitis were observed in the aPDT-group.

* Original language English



HELBO therapy in the case of aggressive periodontitis

[Marburg University, D & Medical Academy Bialystok, PL & Bern University, CH](#)

Authors:

Photodynamic therapy in aggressive periodontitis

Autoren:

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M. Blaes ¹, M. Pietruska ², J. Pietruska ², A. Sculean ³

Institutes:

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² Medical Academy, Bialystok, Poland

³ University, Bern, Switzerland

Abstract: *

OBJECTIVES: Preclinical and clinical data suggest that the additional application of photodynamic therapy (PDT) to nonsurgical periodontal therapy may positively influence the clinical outcomes in chronic periodontitis patients. However, there are very limited data on the effects of PDT when used in conjunction with nonsurgical periodontal therapy in patients with aggressive periodontitis. Therefore, the aim of this case series was to evaluate clinically the effects of PDT as an adjunct to nonsurgical periodontal treatment in aggressive periodontitis patients.

MATERIALS AND METHODS: Fifteen patients diagnosed with aggressive periodontitis were treated with scaling and root planing followed by a single episode of PDT. [Probing pocked depth \(PPD\)](#), [gingival recession \(GR\)](#), and [clinical attachment level \(CAL\)](#) as well as [bleeding on probing \(BOP\)](#) were measured at baseline, [3 and 6 months after therapy](#). Only sites with initial PDD ≥ 4 mm were treated and included in the statistical analysis.

RESULTS: A total of [731 sites](#) were monitored at the different time points while the statistical unit was the subject. [Mean PPD was reduced significantly](#) from 5.00 ± 0.48 mm to 3.99 ± 0.87 mm after 3, and to 3.89 ± 0.866 mm after 6 months ($p < 0.001$), respectively. [Mean CAL changed](#) from 5.75 ± 1.44 mm at baseline to 4.79 ± 1.37 mm after 3 and 4.74 ± 1.41 mm after 6 months, respectively ($p < 0.001$). [GR increased significantly](#) from 0.76 ± 0.9 at baseline to 0.82 ± 0.97 (3 month; $p=0.013$) and 0.84 ± 0.98 (6 months; $p=0.008$). [BOP was significantly reduced](#) from 70.73 ± 33.01 % to 37.00 ± 19.45 % ($p<0.001$) and 44.07 ± 23.04 % ($p=0.002$) after [3 and 6 months](#), respectively. There were [no statistically significant differences](#) in any of the evaluated parameters between 3 and 6 months.

CONCLUSION: [In patients with aggressive periodontitis nonsurgical periodontal therapy followed by a single application of PDT resulted in significant PPD, CAL and BOP improvements at 3 and 6 months following therapy.](#)

* Original language English

Poster available as a reprint.

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Used photodynamic system: HELBO

Silva L., Novaes A., De Oliveira R., Nelson-Filho P., Santamaria M., Silva R.

Antimicrobial photodynamic therapy for the treatment of teeth with apical periodontitis: A histopathological evaluation

J of Endodontics; 2012

Used photodynamic system: HELBO

Auschill T., Arweiler N., Pietruska M., Pietruska J., Blaes M., Sculean A.

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Used photodynamic system: HELBO

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The effect of a single episode of antimicrobial photodynamic therapy in the treatment of experimental periodontitis.

Microbiological profile and cytokine pattern in the dog mandible

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Used photodynamic system: HELBO

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The impact of antimicrobial photodynamic therapy in an artificial biofilm model

Lasers in Medical Science, 10/2011

Used photodynamic system: HELBO

Sigusch B.

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Eberhard T., Neugebauer J., Zöller J. E.

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A 2 year study in private dental clinic

Posterpresentation, Academy of Osseointegration 2008, Febr./March.

Used photodynamic system: HELBO

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Used photodynamic system: HELBO

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J Clin Periodontol 2008; 35: 877-884.

Used photodynamic system: HELBO

Chondros P., Nikolidakis D., Christodoulides N., Rössler R., Gutknecht N., Sculean A.

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Used photodynamic system: HELBO

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Used photodynamic system: HELBO

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Initial Therapy of Periimplantitis by Antimicrobial Photodynamic Therapy

Posterpresentation ADI 2007, May 3-5.

Used photodynamic system: HELBO

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Used photodynamic system: HELBO

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Used photodynamic system: HELBO

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