

The endodontically-compromised tooth: to treat or replace?

Early and late failures of oral implants

An overview of lasers in dentistry

The laser in oral biopsies

Treating gingival recession



Multi-treatment dental laser platform

Page 10



Boxless, digital X-ray sensors

Page 33



Surgical kit for indirect maxillary sinus lifts

Page 27

Minimally invasive treatment of periodontitis

Periodontal disease has traditionally been treated with methods that include anesthesia, cutting the gingiva with a scalpel, treating and removing the diseased tissue and suturing the surgical wound. This article describes laser treatment for periodontal disease and highlights the advantages of this approach for both patients and practitioners.



disease, low birth weight in neonates, myocardial infarction, stroke and osteoporosis [2].

Periodontal disease has traditionally been treated with conventional methods that require anesthesia, cutting the gum with a scalpel, treating and removing the diseased tissue and suturing the surgical wound. Laser treatment of periodontal disease is an alternative that is rapidly gaining popularity as it is much more practitioner- and patient-friendly compared to the conventional cold-steel surgical approach. The application of laser significantly enhances treatment success rates and reinforces the healing response because it prevents reinfection and promotes reduction in pocket depths [3]. Periodontal laser procedures are generally faster, with no vision-obscuring bleeding.

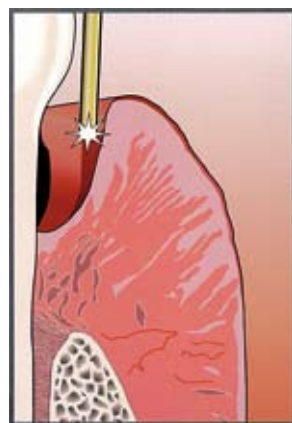
Wavelength-optimised Periodontal Therapy

Wavelength-optimised Periodontal Therapy (WPT) is the term we use for minimally invasive laser treatment of periodontal disease. This latest therapeutic breakthrough in laser dentistry combines the laser industry's two most optimal wavelengths – 1064 nm Nd:YAG and 2940 nm Er:YAG - for periodontal treatments. Wavelength is important because different laser sources react differently when interacting with different tissues. In WPT, laser energy is directed into the tooth pocket with the aim of reducing the number of bacteria, removing the debris and hardening the root surface. This is carried out in three simple steps.

Periodontal disease is the most common form of gum disease that affects a large percentage of the population. Research shows that 30% of the population may be genetically susceptible to developing gum disease [1]. Male smokers above the age of 35, cardiac patients, pregnant women and diabetics are most at risk, although teenagers can also be affected. Periodontal disease is particularly hazardous because it can cause serious health problems such as cardiac and respiratory

Step 1

Using the Nd:YAG laser, the diseased epithelial lining of the periodontal pocket is removed. Coagulation, additionally, provides a dry surgical area and consequently better visualisation (reduced bleeding index).



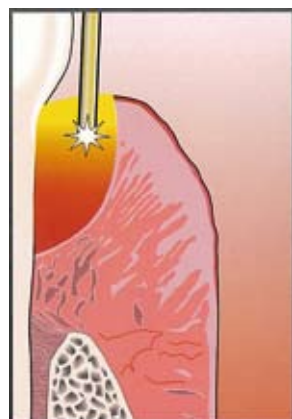
Step 3

Finally, the Nd:YAG laser is used to promote coagulation and sealing of the pocket with a stable fibrin clot, leaving a surface that heals without complications and post-operative pain for the patient. This prepares the tissue surface for eventual reattachment with the root surface.



Step 2

Er:YAG is then used to thoroughly, yet gently, remove calculus from the root surface, and thin layers of coagulated connective tissue from the soft pocket wall. Each movement across the tissue removes a single thin layer. The bactericidal effect that is obtained with the Er:YAG laser enhances bone healing and regeneration [4] leading to new bone formation [5].



Research into laser periodontal treatment

It has long been thought that with severe forms of periodontal disease, the tooth and surrounding tissue damage is irreversible. However research shows that with the help of a laser, reattachment of the soft tissue with the tooth is more likely to occur and will do so faster; i.e., after six months, almost 90% of the laser-treated pockets will have reduced [6]. In addition, growth of new periodontal tissues or regeneration on tooth roots is stimulated, preventing tooth loss [3]. A more recent study found a significant increase in epithelial thickness, with long and irregular connective tissue protrusions projecting into the under-surface of the epithelium, suggesting enhanced wound healing [7].

In Slovenia, a pilot clinical study was carried out at the Ljubljana

Dental turbine with optimal illumination



The dental turbines of the Synea range with LED+, the TA-97 C LED and TA-98 C LED, are ideal for the removal of decayed materials, cavities and crown cement, and fillings, as well as for finishing of tooth and restoration surfaces. Optimum visibility of the treatment site is ensured, and due to the daylight quality of the light, exceptional reproduction of natural colours and clear colour contrasts are enabled. This is because with a colour temperature of 5,500 K, the dental turbines produce a radiation spectrum that corresponds to daylight, and a high colour rendering index of more than 90 allows natural colours and clear colour contrasts. The extremely small head sizes of the dental turbines provide maximum visibility, and by positioning the LED chip directly on the head of the dental turbine, the largest possible illumination area is created. This position of the light is particularly useful when treating deep cavities.

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Patient-friendly information software



The Patient InfoPoint is a user-friendly, touch-screen tool for dental receptions. The 40" LCD television screen can be used to inform and engage patients in the waiting room.

Content can be shaped and controlled by staff, and management software includes templates for popular features and announcements. The touch-screen kiosk enables users to register to receive emails about treatment options and see 'before and after' illustrations of treatment. The Patient InfoPoint can also be set up to carry out patient surveys that can then be analysed and collated automatically.

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Laser vs. Conventional Surgical Periodontal Treatment

	Laser Treatment	Conventional Surgical Method
Comfort level during procedure	High	Low
Patient acceptance	High	Low
Suturing	No	Yes
Bleeding	Minimal	Strong
Expected gum recession	Up to 0.5 mm	Up to 2 mm
Level of trauma	Non-invasive	Invasive
Duration of treatment	2 - 3 min per tooth	6 - 7 min per tooth
Recovery	Epithelization is possible in 2 weeks, regeneration of the connective tissue in 4 - 5 weeks	3 - 6 months
Post-operative complications	Less likely	More likely
Suitable for pregnant women	Yes (in most cases)	No (in most cases, because anesthesia is required which could endanger the baby)

University Medical Faculty led by Dr. Boris Gaspirc from the Department of Oral Medicine and Periodontology. Ten patients (84 teeth) with advanced periodontal disease (pocket depth ≥ 6 mm) were treated with a Fotona Er:YAG and Nd:YAG dual wavelength laser system. Although the final clinical end-results of using the laser combination are comparable with conventional surgical treatment, the advantages of the laser procedure far outweigh conventional methods. These are minimal invasiveness, the speed and ease of the procedure, elimination of the need for suturing and fewer, if any, post-operative complications. Certainly the post-operative comfort level for the patient is far higher without sutures than with conventional surgery, which always requires sutures.

In order to perform wavelength-optimized periodontal treatments, a dual Er:YAG and Nd:YAG wavelength laser system is an ideal choice. Fotona's AT Fidelis is one of several examples of laser systems on the market that offer both wavelengths in one package. This means that there is no need to make a double investment, and the system also offers the convenience of allowing a quick switch between laser sources during the procedure, saving valuable chair time.

In laser treatment, minimal invasiveness into the area

that is being treated should be emphasised as the major advantage. In conventional treatments, when one single spot on the tooth has an increased probing depth of 5 mm or more (measurements are made at six spots), it is necessary to release and open all the tissue surrounding that tooth and at least half of the adjacent tooth, to access the dental pocket. In laser treatment, on the other hand, only the dental pocket is involved, while the adjacent tissues remain untouched and intact.

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The AT Fidelis laser system (see page 10) allows wavelength-optimised periodontal treatments capitalising on the inherent benefits in periodontal therapy wavelengths of the two lasers available in the system. The advantages of laser treatment of periodontal disease include faster and less invasive treatment with minimal trauma. The treatment is safer, with less post-operative complications and less chance of recontamination. Treatment is more precise and efficient in removing calculus. There is also improved gum reattachment and growth of new periodontal tissue, as well as a shorter recovery time. Patient satisfaction and acceptance is understandably higher than when using classical methods for calculus removal.

My AT Fidelis gives me the gentle touch my little patients need. No more whining noise and vibrations from the drill. Most patients don't even need any anesthesia! I work faster, can do procedures without suturing and get great results. Gone are my days of treating terrified patients; they now interact with me completely differently. They love coming to my practice and so do their parents!

[Signature]
Fotona user since 2003



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AT Fidelis Highest Performance in Dental Care

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The AT Fidelis is Fotona's newest generation in dental laser systems. With dentistry's two best lasers in one system, you can provide the ultimate in dental care! AT Fidelis' Er:YAG, the world's fastest drilling, hard tissue laser, features broadened soft tissue surgery capabilities with the finest low pulse, high repetition rates. Its top-of-the-line Nd:YAG laser provides trouble-free endodontic, surgical and aesthetic procedures. Both lasers feature VSP technology, enabling controlled and constant laser intensities, in an unprecedented five, selectable pulse duration modes.

Convenience and Safety First

The AT Fidelis includes the newest Comfort Mode touch screen navigation system. Its pre-set treatment programs and data storage facility offer ultimate treatment management. Selecting the right treatment settings has never been easier!

Its Advanced Mode enables users to quickly fine-tune procedures through its all-encompassing interface. The AT Fidelis offers the industry's only Tissue effect Graphical Interface (TeGI) which provides precise graphical representations of laser-tissue effects as treatment settings are changed. For improved user comfort, the AT Fidelis features a wireless footswitch. While ESC Technology allows you to perfect water and air spray mixes, the AT Fidelis does not require external air or water sources, making it uniquely mobile.

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Apart from providing the widest range of hard and soft tissue dental treatments, you can also upgrade your system with aesthetic upgrade packages. This enables you to provide aesthetic treatments ranging from facial laser hair removal and rejuvenation treatments to facial vascular treatments.



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