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Prof. Dr Norbert Gutknecht
Editor-in-Chief

Wavelengths

Dear readers,

As sunlight consists of different wavelengths and can only in this composition of wavelengths serve the vital biological requirements, future-oriented laser users have to learn that, although the application of a wavelength is important and good, the same wavelength cannot fulfil all biological and therapeutic demands. Based on this insight, the future of laser dentistry will be associated with the combination of specific wavelengths.

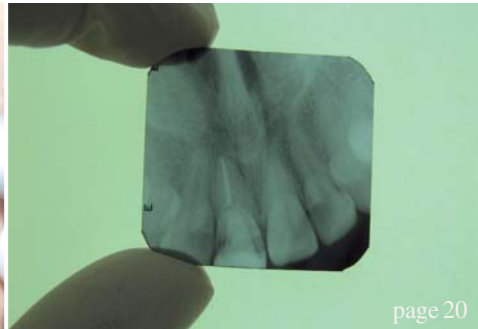
Success or failure of a laser treatment is inseparable from the selection of the correct wavelength. The better the biophysical knowledge of the laser user, the better he or she would be able to select the wavelength to target the intended tissue, triggering the desired interaction. Since there are different tissue types in the oral cavity—in areas of little space, such as in periodontal pockets—it may be necessary to involve two different wavelengths in the treatment planning. This knowledge is increasingly used by manufacturers of laser devices not only to extend the indication spectrum of their devices, but also to optimise specific treatment procedures by combining two or more wavelengths. The combination and application of different wavelengths will thus be one of the main themes at this year's international annual congress of the Deutsche Gesellschaft für Laserzahnheilkunde (German Society for Laser Dentistry) and will be reflected in lectures and workshops, as well as in the dental exhibition.

For the summer months ahead, I wish you much pleasure in enjoying the different wavelengths of sunlight.

Kind regards,

A handwritten signature in black ink, appearing to read 'Norbert Gutknecht'. The signature is fluid and cursive, with a large initial 'N'.

Prof. Norbert Gutknecht
Editor-in-Chief



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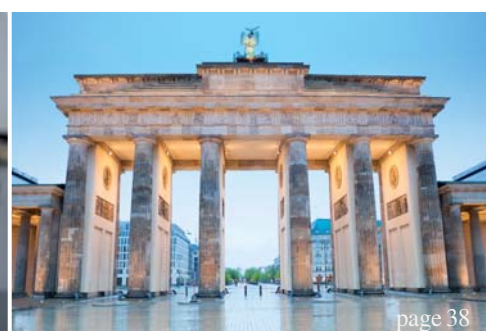
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Preventive approach in paediatric dentistry using Er:YAG laser

Author Ani Belcheva, Maria Shindova & Georgi Tomov, Bulgaria

Modern dentistry has focused on preventive methods and conservative techniques to apply less-invasive procedures to tooth structure.¹ Awareness towards the importance of preserving tooth tissue combined with a patient-friendly approach is becoming self-evident. It has been shown that operative dental treatment often leads to an increasing scale of more surgical and invasive treatments. Whenever possible, tissue should be preserved, and invasive treatment should be kept to a minimum. The best way to ensure maximum life for the natural tooth is to respect the healthy tissue and protect it from being damaged by using minimally-invasive techniques in restorative dentistry.²

Preventive dentistry

Preventive dentistry is a branch of dentistry that deals with the preservation of healthy teeth and gingiva and the prevention of dental and oral disease. The field involves dental procedures, materials and programmes

that prevent the occurrence of oral diseases or retard their further progression. There are three levels of preventions:

Level 1: Primary prevention

The pre-pathogenic stage employs measures that forestall the onset of the disease to reverse the progress of the initial stage, or to arrest the disease process before treatments become necessary.

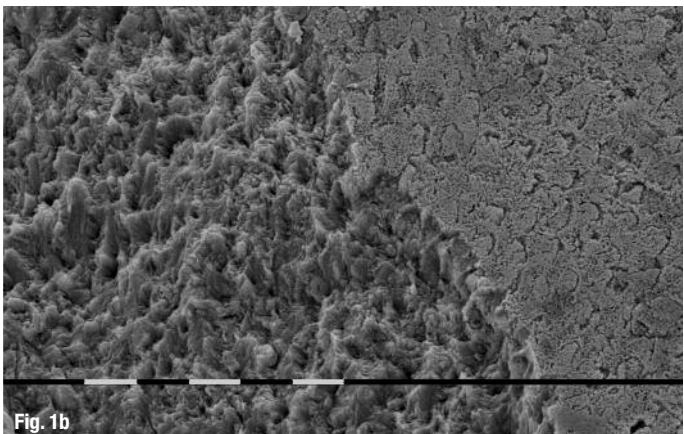
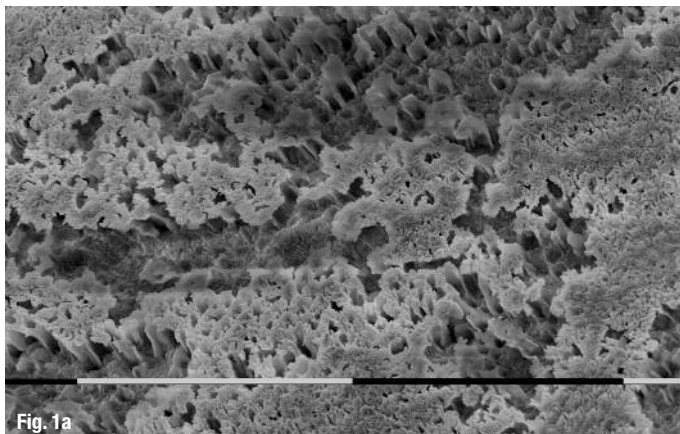
Level 2: Secondary prevention

The pathogenic stage employs treatments methods, to terminate a disease process and to restore tissues as near normal as possible.

Level 3: Tertiary prevention

At this level, prevention employs measures that are necessary to replace much tissue and to rehabilitate patients to the point that functionality resembles its natural condition, as much as possible, after the failure of the secondary preventions.

Figs. 1a & b Acid etching of hypoplastic enamel showed patchy loss of surface tooth structure without evidence of uniform etching patterns (a). The laser treated surfaces showed that Er:YAG radiation caused an uniform roughness of the enamel for HE (b) teeth (magnification x 3,000).



In recent years, the development of new technologies made it possible to prevent complications and to conduct treatments with minimal intervention. Laser treatment with its considerable variety of biological actions and high therapeutic effectiveness is used widely both in medicine and dentistry. Erbium lasers could be used in large array of both hard and soft tissue procedures performed in paediatric dentistry.³ Many of these procedures may be treatments that require a specialist. However, when Er:YAG lasers are being used their efficacy and special characteristics allow general practitioners to perform and complete a wide range of these procedures. The advantages of Er:YAG laser are associated with a process of ablation, decontamination, minimal invasion and analgesia, thus providing clinical solutions to what once was attribute solely to experts. The purpose of this study is to describe the scientific approaches to prevention by using Er:YAG lasers.

Er:YAG laser characteristics and advantages

Ablation

Er:YAG laser has a wavelength of $2.94\ \mu\text{m}$, which matches exactly the absorption peak of water and which is also absorbed by hydroxyapatite. Erbium laser radiation is very efficient in removing both dentin and enamel, limiting the laser effect on these tissues to a superficial layer of a few micrometres. The overheated water abruptly vaporises and the so released vapour carries away surrounding broken tissue fragments in a thermo-mechanical ablation process.^{4,5}

In general, there is a linear relationship between crater depth or removed volume and applied energy density.¹⁵ Water mist is needed to avoid thermal side effects and for pain control.⁶ The way to remove hard tissues with Er:YAG without overheating prevents the pulp. Er:YAG laser ablation works in a minimally-invasive way, removing only the damaged tissues. It prevents destruction of sound structures and gives opportunity for a fast healing process.

Decontamination

The bactericidal effect of laser light was advanced to be one of its beneficial effects. The wavelengths well-absorbed in water have a good bactericidal effect even at low-energy density output levels, starting at $0.3\ \text{J}/\text{cm}^2$, without excessive temperature elevation.⁷ Due to its bactericidal effect combined with the reduced pain sensation during its application, the Er:YAG laser was a very promising tool for cavity preparation in Paediatric Dentistry and in Dentistry in general. Antimicrobial resistance or drug resistance is a problem spread and discussed worldwide. It is a major concern of the WHO. The ability of Er:YAG laser to establish decontamination is a solution for effective treatment and prevention of future complications.

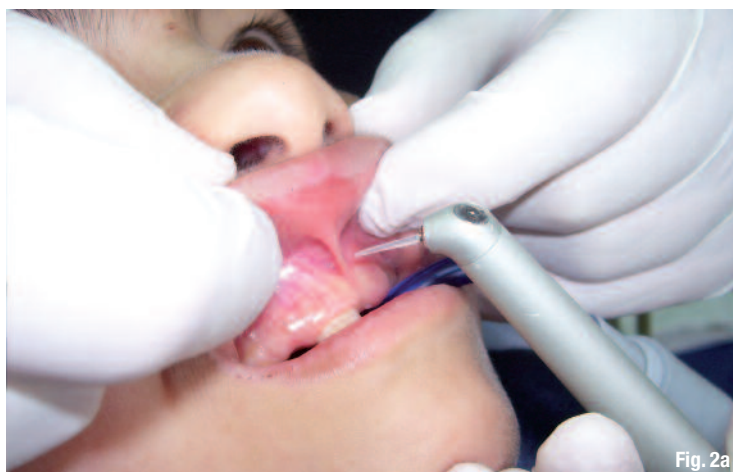


Fig. 2a

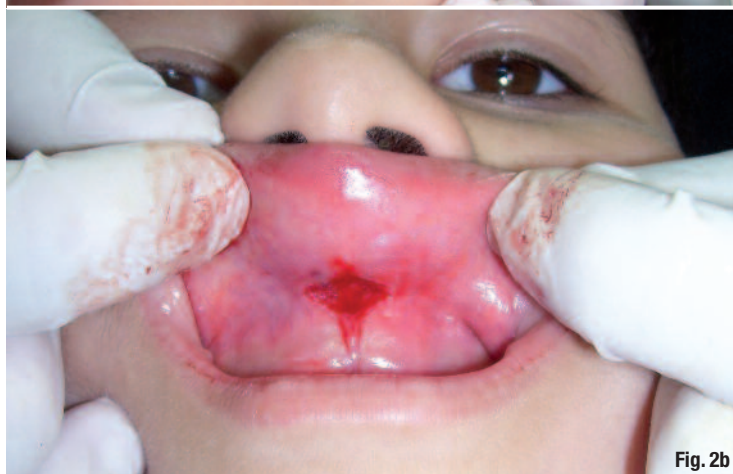


Fig. 2b

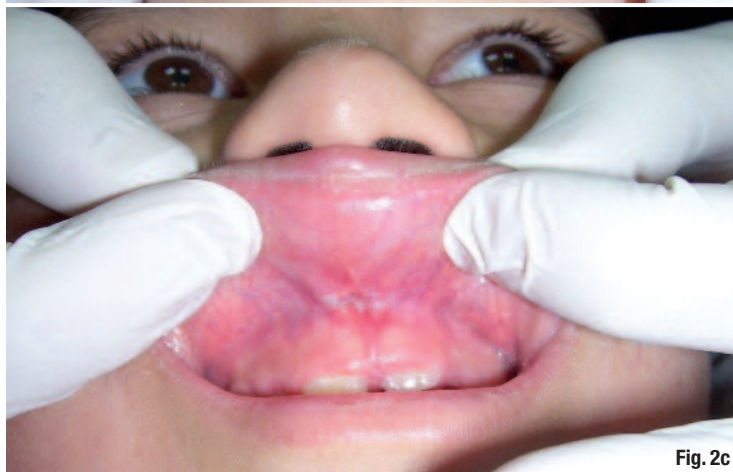


Fig. 2c

Analgetic effect and pain perception

As Er:YAG lasers can be used to prepare cavities without thermal damage and the systems availability on the market offers a high ablation efficiency, it was of interest to investigate the patients' subjective perception of this treatment method: Cavity preparation with the help of Er:YAG laser was found to be more comfortable in the patients perception than mechanical treatment in at least 80 per cent of the cases.^{10, 11}

One of the parameters partly explaining the absence of pain perception is the difference in tooth vibration

Figs. 2a–c_ Maxillary frenectomy with LiteTouch, Er:YAG laser.



Fig. 3a



Fig. 3b



Fig. 3c

Figs. 3a–c Lingual frenectomy of 7-year-old boy with Lite Touch, Er:YAG laser.

speed caused by Er:YAG laser versus high-speed drill. Mean vibration speed during laser cavity preparation reaches $166 \pm 28 \mu\text{m}/\text{second}$, at a characteristic frequency of 230 Hz, whereas the high-speed drill induces a 100 times higher vibration speed of $65 \pm 48 \text{ mm}/\text{second}$, at 5 kHz. In addition, this much higher frequency has its spectrum near the peak sensitivity of hearing, as a potential factor of discomfort and pain provocation.¹²

A patient may suffer progression of oral disease if treatment is not provided on time because of age, behaviour, inability to co-operate, disability, or medical

status. Postponement of dental care can result in unnecessary pain, discomfort, increased treatment needs and costs, unfavourable treatment experiences, and diminished oral health outcomes. Using Er:YAG laser in patients with fear or phobia of dental treatment is a real opportunity to treat them and show an alternative well-accepted method to overcome the barrier of dental care. With the help of Er:YAG laser, patients realise that there is a way to preserve their teeth without pain, which will encourage them to take care of their oral health more frequently and at the end only for prevention.

Application of Er:YAG laser in hard tissues

Primary Caries Prevention

Laser is becoming common in clinical dental care and is one of the promising new modalities used for caries management. In many studies was investigated the possibility of sub-ablative energies to increase the acid resistance and the micro-hardness of enamel surface and to reduce enamel solubility by increasing caries resistance without severe alterations of the enamel.¹³ Laser-fluoride effect on enamel found that low-energy Er:YAG laser irradiation coupled with fluoride treatment could inhibit enamel demineralisation through increased fluoride deposition on the surface and formation of fluoridated hydroxyapatite.¹⁴ In one recent study, silver diamine fluoride (SDF) application followed by sub-ablative low-energy Er:YAG laser irradiation on dentine rendered the dentine surfaces more resistant to caries development, both chemically and mechanically.¹⁵ Lasers have also been used to prevent the enamel demineralization caused by dental caries and have shown good results.^{16,17} The Er:YAG laser has been shown to reduce or prevent the demineralization of tooth enamel.¹⁸ In some studies, when associated with fluoride,^{19,20} it leads to a reduction in mineral surface loss.

Sealants reduce the risk of caries in susceptible pits and fissures of primary and permanent teeth.²¹ The enamel surface prior to the placement of the sealant can be pre-treated in different ways. Non-invasive techniques include only etching with 37 per cent orthophosphoric acid or air abrasion and acid etching. Invasive techniques use burs for opening the deep and narrow fissures and then acid etching. Preparing the enamel surface with Er:YAG laser with subsequent acid etching is considered as non-invasive technique for pre-treatment of pits and fissures. This laser wavelength has special uses in the domain of primary and secondary prevention which include sealing of pits and fissures and cavity preparation.²² This technology makes the enamel more resistant to caries attack, and also the need to acid etching procedure is eliminated, or reduced.^{22,23} The use of laser gives the dentist the ability to clean and sterilise enamel fissures. The bactericidal effect of Er:YAG laser irradiation could boost the inter-



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est in the already widely accepted pits and fissures sealing procedures. A simultaneous cleaning, conditioning and decontamination in hardly accessible depths of fissures would open a new perspective to this preventive treatment. Er:YAG pre-treatment and subsequent acid etching with highly concentrated phosphoric acid was equivalent to etching only.¹ The long-term success rate of a fissure sealant depends on its resistance to microleakage, its retention and micromechanical adhesion to the enamel surface, that is remaining completely intact.^{24,25}

No significant difference in microleakage was reported between extended fissure sealing with a bur and phosphoric acid-etching or Er:YAG and phosphoric acid-etching. Laser irradiation did not eliminate the need for etching enamel.²⁶ Sealing the sound fissures reduces the risk of caries and the use of Er:YAG laser for conditioning and enamel sterilisation preserves the tooth surface for a long time. There were some important differences between the results of various studies in evaluation of the bond strength of restorative material bonded to teeth surfaces etched or conditioned with Erbium laser family and with acid etch technique. These differences could be the results of laser parameters (energy and frequency) and the type of restorative material used. The obtained SEM images showed an increase in retention of restorative material for the surfaces irradiated by laser and a decrease in bacteria in the pits and fissures, the sterilisation property of laser on irradiated surfaces is seen. In general, the best results have been obtained in simultaneous use of laser and acid.^{1,27,28}

Etching pattern of defective enamel is vague and has no resemblance to that of normal enamel.²⁹ This could be due to difference in structure and composition of defective enamel. Seow W.K. and Amaratunge suggested that variation of etching patterns could be due to differences in orientation of crystallites relative to the direction of attack together with differences in chemical composition between central and peripheral parts of enamel prisms.³⁰ This explanation may highlight the variation in enamel structure that can occur not only between normal and defective enamel but also from tooth to tooth, or site to site, on a single tooth surface.³¹ Also, variation of etching patterns for defective enamel could be a result of different aetiology of the enamel defects in different teeth which is unknown.³⁰ These variations may result in problems in bond strength.²⁹ Hypoplastic enamel surfaces prepared with Er:YAG laser LiteTouch are characterised by a rough and regular topography without presence of smear layer in contrast with the surfaces treated with acid (Figs. 1a & b). The acid etching of a less organised hypoplastic enamel structure may result in a pattern that is not the classic etched pattern, which may have a detrimental effect on bonding between the adhesive materials and the affected enamel. Laser ablation procedures change enamel and the sur-

faces appeared strong retentive and suitable for adhesive restorations.^{32,33} Preparation of hypoplastic or hypomineralised enamel with Er:YAG laser is a way to reconstruct the surface for achievement of better adhesion. If the surface is not retentive enough, the adhesion will be poor and this can compromise the restorations. Laser treatment with Er:YAG laser proposes effective bond strength.³³

Restorative dentistry

Er:YAG laser wavelength of 2,940 nm is strongly absorbed by water. It is thus effective and efficient in dental hard tissue ablation. Er:YAG laser has been studied in periodontics³⁷, restorative³⁸ and surgical treatments.³⁹ A great advantage of Er:YAG is that it has little chance of pulpal damage if used under sufficient water cooling. Minimal pain has been reported with its use, and it is thus used without local anaesthesia. During cavity preparation, the procedure begins with the use of very low-energy settings of the laser in order to achieve an analgesic effect on the tooth involved. Then the higher-power setting of the laser is used in order to remove the enamel and expose the infected dentin. Subsequently, the low-power setting is used once again to remove decayed dentin.³⁴ Different ablation rates for carious and sound tissue lead to selective removal of carious lesions.³² No smear layer is formed with the application of laser, which results in an increase in bond strengths.³²

Er:YAG lasers are selective for carious tissue and comfortable in use. The introduction of a new generation of Er:YAG lasers in 2007 finally made it possible to enjoy a device that automatically balances high energy output with a wide range of frequency ranges that free from conducting settings calculations while treating their patients—saving them time and worries. There is a laser in the market from the Er:YAG family including pre-set options, with perfectly balanced high energy output with a wide frequency range along with the precision control of pulse duration that fits the selected procedure. Thus, the dentist is concentrated in his work with no need for complicated calculations. The array of indications covers almost every possible treatment of dental hard tissue from simple fissure sealing to cavity preparation. It is important to point out the positive and preventive clinical dental care that is one of the promising new modalities used for caries management. The combined fluoride-laser-treatment makes enamel more resistant to acid than do either laser or fluoride treatments alone.^{14,35} Er:YAG laser can also transform enamel hydroxyapatite into fluoridated hydroxyapatite to reduce enamel solubility as a preventive treatment for enamel caries.¹⁴

Compared to the smooth appearance of the cavity walls after bur preparation, cavity margins and walls are irregular but without any smear layer after ablative

Er:YAG irradiation.³⁹ Conservative dentistry as its name says is a part of dentistry that uses more conservative or minimally-invasive approaches to fulfil its goals. That is why preparing the hard tooth structures with Er:YAG proposes minimal intervention and prevention with respect to the sound tissues. The minimal penetration and lack of thermal changes in the pulp prevent the occurrence of complications.

Laser Application in soft tissues

Maxillary frenectomy

The abnormal junction of the frenum on the maxilla results in diastema between teeth, weak hygiene, gingival retraction, and repetitive trauma during tooth brushing. The best laser for the treatment of such a condition is the Erbium laser that is used simultaneously with water spray. This intervention is performed without the need of suturing, scar tissue formation and any problems in healing. Usually, frequencies between 30–45 Hz and an energy between 35–55 mJ are used. On the other hand, with the use of laser, limitation of the amount of hemorrhage during the surgery helps to provide a better field view for surgeon. Furthermore, patient's comfort after surgery is without doubts one of the biggest advantages for patients.^{51–53}

Figures 2a–c show a case of a 6-year-old boy with a revision of the maxillary frenum. When the labial frenum is penetrating the palate or papilla it will have the potential for developing orthodontic abnormalities, discomfort, difficult articulation or even carious lesions from poor hygiene. That's why an early frenectomy of such a harmful frenum could prevent the development of the mentioned pathology.

Lingual frenectomy in ankyloglossia

Ankyloglossia is a frequent finding in newborns that can cause significant problems in terms of breast feeding, nutrition and speech if the adhesion is severe. For the treatment of this condition Erbium laser with topical anaesthesia or little needle anaesthetic are used (Figs. 3a–c).⁶⁴ The lingual frenum is incised with low energy 50 mJ, 10–15 Hz. The parameters must be changed if more fibrotic tissue is present or haemostatic effect is necessary. Laser frenectomy of the lingual frenum prevents speech disorders, as the correct phonetic, that are formed during the first ages of life. When there is mechanical reason such as thick and tight lingual frenum that limits the mobility of the tongue the feeding will also be disturbed. Restoration of the normal tongue mobility makes easier the clinical work on the rest of the dentition.

Exposure of unerupted teeth during orthodontic treatment

For soft tissue removal and exposure of unerupted permanent teeth for orthodontic objectives it is possi-



Fig. 4a



Fig. 4b



Fig. 4c

ble to use different wavelengths of lasers, including Er:Cr:YSGG, Nd:YAG, Er:YAG and Diode laser. Erbium laser has the ability to remove soft and hard tissues. When using this laser, one should pay close attention to the enamel in the surgical point surroundings. This risk doesn't exist when using diode and Nd:YAG since their wavelengths do not interact with hard tissues. For tooth exposure, only soft tissue removal is necessary. Most of the time the surgery can be performed without the need of a local anaesthesia but with the application of topical anaesthetic only, which is a big advantage in the treatment of small patients. The parameters should be

Figs. 4a–c Exposure of unerupted tooth 45 with LiteTouch, Er:YAG laser.

Figs. 5a–c Laser gingivectomy of lower left quadrant with LiteTouch, Er:YAG laser.



programmed to 50–75 mJ with a frequency of 10 to 30 Hz. To reinforce the hemostasis, the Erbium laser with energy of 65 mJ is used, frequency of 20 Hz and pulse duration of 600 μ s.³ Figures 4a–c demonstrates a case with exposure of interrupting premolar.

Er:YAG laser is very effective when the impacted tooth is located intra-bony, because it can work on mucosa, gingival and bone at different parameters. The Erbium laser with energy more than 100 mJ and frequency of 20 Hz is used for soft tissue cutting and bone removal.

Gingival remodelling and gingivectomy

In children with gingival hypertrophy, we can use various lasers for gingival remodelling. Gingival hypertrophy can be caused by some hydantoin anticonvulsants or other medications.⁶⁴ It can be induced during different stages of orthodontic treatment and especially when there is poor oral hygiene. Also, in cases of tooth decay that goes under the gingiva, it's possible to use a laser to remove gingival tissue and proceed through repair stages without gingival haemorrhage. In gingivectomy, Erbium laser can be used at low energy of 55–80 mJ and frequency of 10–20 Hz (Figs. 5a–c). The use of water spray reduces pain and helps tissue cooling. The procedure is usually accompanied by controllable bleeding. A gingivectomy during an orthodontic treatment brings the natural contour of the gingival margin. It makes treatment easier and comfortable both for the patient and the clinician. If the overgrown gingival tissue covers the brackets, it will prolong and trouble the treatment. Gingival remodelling improves the smile line. It is important to preserve the biologic width of the periodontal tissue. The procedure is performed under anaesthesia and the parameters for Er:YAG laser must be reduced to 50 mJ, 10–20 Hz.

Laser therapy offers minimally painful treatment that will not leave negative emotions. The technique is safe, fast and easy to reproduce. The decreased operating time leads to patient's acceptance and early treatment without waiting for further complications.

Treatment of aphthous ulcers and herpetic lesions

Aphthous ulcers are very common in children. One of the easiest and most appropriate ways to treat these lesions is the application of a low power laser like the Erbium laser without using local anaesthesia. It is possible to use Erbium laser with frequency of 15 Hz and energy of 35 mJ in a non-contact way. First, the laser is main-

tained for 15 s on the lesion and then it is moved in a rotation pattern above the lesion. The treatment is prolonged to a 1 mm margin outside the lesion.^{66,67} The idea is to detoxify and dehydrate the ulcer as well as to induce bio-stimulating effect.⁶⁶

Herpetic gingivostomatitis is the most frequent oral pathology in small children. A laser treatment with mid-infrared lasers like Erbium laser, allow the evolution of the lesions and consequently instant dehydration. Er:YAG laser effectively stops the pain and makes the treatment procedures shorter in time and less in number. Minimal energy at a low frequency must be used at the beginning of a treatment around the lesion and then towards the centre of the lesion. The white appearance is an indication for a complete dehydration. The procedure is asymptomatic and has a lasting relief.

Medically compromised conditions

To provide thorough and safe treatment for medically compromised patients, who cannot tolerate care, dentists must carry out more complex dental treatments for the safety and comfort of the patients. Physically and emotionally exhausting treatments cannot be tolerated by such patients. Naturally, systemically compromised patients quickly discover that they cannot withstand the stress of routine treatment used in conventional dentistry. Therefore, after some unpleasant experiences, patients will only seek dental support when there is an emergency or when they have aesthetic concerns, and they abandon elective complete treatment.⁶⁸ The treatment of oral diseases that individuals with systemic conditions receive has a direct impact on their overall health and/or medical therapy, and includes care to control and mitigate pain and infection and the restoration of function. Oral health care is an integral part of systemic treatment.

Providing both primary and comprehensive preventive and therapeutic oral health care to individuals with special health care needs (SHCN) is an integral part of the specialty of paediatric dentistry. Individuals with SHCN may be at an increased risk for oral diseases throughout their lifetime.^{69,70} Patients with mental, developmental, or physical disabilities who do not have the ability to understand, assume responsibility for, or cooperate with preventive oral health practices are vulnerable as well.⁷¹ Oral health is an inseparable part of general health and well-being. SHCN

also includes disorders or conditions which manifest only in the orofacial complex (e.g., amelogenesis imperfecta, dentinogenesis imperfecta, cleft lip or palate, oral cancer). While these patients may not exhibit the same physical or communicative limitations of other patients with SHCN, their needs are unique, affect their overall health, and require oral health care of a specialised nature. Dental treatment, using Er:YAG laser therapy helps the dentist even in the field of medically compromised children. It offers the opportunity to fulfil patients' needs fast, painless and effective. The new perspective in preventive dentistry is seen in all the advantages of Er:YAG laser treatment, because with this it became possible to use one appliance in many preventive and therapeutic procedures and thus patients' compliance. Whenever there is prevention the ergonomic effect is obvious because minimally invasion and prevention of complications are worth benefits.

—Patient emotional impact-based situations

The terms dental fear, dental anxiety and dental phobia are currently being used interchangeably in dental literature when referring to negative feelings related to dental treatment. Dental fear represents a normal emotional reaction to a specific external threatening stimulus in a dental situation. Dental anxiety represents a state where the patient is evoked and prepared for something unpleasant, unknown and negative to happen. Dental phobia represents a severe type of dental anxiety, which is characterised by persistent fear of clearly discernible objects and situations and results in avoidance of necessary dental treatment or enduring treatment only with dread.⁴¹ These psychological reactions interfere significantly with daily life. They are problems suffered by many patients worldwide and remain a significant challenge in providing adequate dental care. The aetiology of dental fear and anxiety is multifactorial. The idea of a "vicious cycle of dental fear and anxiety" has been promulgated by several studies to explain the mechanism of their appearance and development. Some researchers posit a role of psychological variables such as embarrassment and feelings of shame culminating in avoidance of dental treatment and deterioration of oral health³⁴⁻³⁶ (Fig. 6), whereas Bauma et al. propose that anxiety plays a crucial role in the "vicious cycle of dental fear".⁴⁴

Several studies among Australian dental patients present the role of dental fear as a component in the cycle of dental disadvantages with dentally anxious individuals avoiding dental care. It results in worsening their dental problems and increasing the likelihood that subsequent dental visits will be for emergency

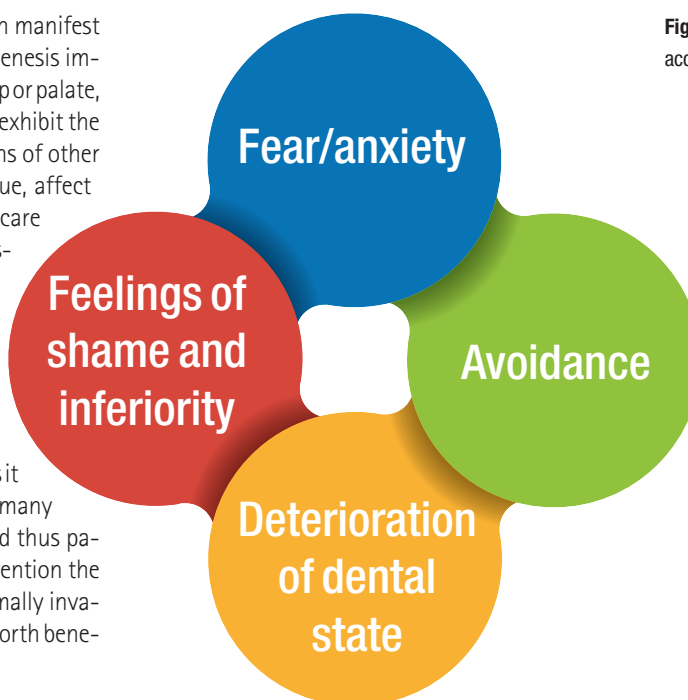


Fig. 6 Vicious cycle of dental fear according to Berggren.

reasons. So dental fear feeds back itself as a result of a number of repercussions of the fear. These conceptualisations are described in another model of the so-called "vicious cycle of dental fear" (Fig. 7).^{45,46}

A recent study by van Wijk and Hoogstraten investigated the interaction between anxiety and dental pain. They suggest that people who respond fearfully to pain are at increased risk of ending up in the "vicious cycle of dental anxiety" (Fig. 8).⁴⁷ If this cycle is not broken, a severe form of dental anxiety, dental phobia, might develop. So they propose a modification of the "vicious cycle" emphasizing the leading role of the fear of pain in the mechanism of the development of dental anxiety. In view of the above mentioned, it is suggested that dental fear and anxiety result in a delayed and symptom-driven treatment culminating in an avoidance of necessary dental care and deterioration of both oral health and overall health. This linked chain feeds back into the experiences of dental fear and anxiety. Overall, these studies highlight the need for alternative methods in dentistry that will weaken the impact of the main components that nourish and empower the "vicious cycle". Consequently, the proven connection between dental anxiety and pain^{48,49}, keeps patients away from the dental practice and thus may frequently result in acute symptoms and complications. The 21st century calls for a different treatment atmosphere and conditions that eliminate the elements constructing the "vicious cycle" of dental fear.

—Decreasing dental anxiety

Several studies have shown that the most potent triggers for dental anxiety are the sight of the anaes-

Fig. 7 Vicious cycle of anxiety, modified by van Wijk and Hoogstraten.



thetic needle and the sight, sound, smell and vibration of dental handpieces and rotary dental drills, which are pain-associated with dental treatment.^{50–52} It has been suggested that reducing these stress-triggers is an effective procedure for managing anxious patients.^{48,49} For this reason, anxious patients who must undergo restorative procedures are often managed using the “4S” rule or the so called “4S” principle. It is based on removing four of the major primary sensory triggers for dental anxiety in the dental setting—sight (air turbine drill, needles), sounds (drilling), sensations (high frequency vibrations—the annoyance factor), smells—and it is used in conjunction with other measures and alternative methods to mitigate anxious behaviours and their consequences.⁴⁸ A therapy with Er:YAG laser in paediatric dentistry has known advantages, especially for the safety of its use and for its gentle approach with patients.⁵³ Dental laser treatment reduces the need for injected local anaesthesia and obtains very low to null likelihood of odontoblastic pain and the annoyance factor during carious removal. There is no smell or dentine ablation vapour in case of inadequate suction during cavity preparation. The dominant physical sensation is popping (shock waves) and ablation sound. This new technology offers new possibilities to the paediatric dentists’ to completely change restorative treatments and thereby help to decrease dental anxiety of patients.

Numerous studies have been designed to determine the subjective acceptance and pain perception of an Er:YAG laser for soft and hard tissue therapy and to consider the influence of this new technology in case of dental anxiety. As results of several studies on patient acceptance of different methods for cavity preparation

have shown, Er:YAG lasers have an acceptable efficiency compared to the conventional mechanical preparation and patients aged ten years and older prefer the alternative method.^{54–56}

The analysis of the obtained results from the use of pain assessment scales indicates that patients have been reported no or low pain perception during laser preparation in contrast to the high pain levels during the conventional mechanical preparation. The significant decrease of patient discomfort and dental anxiety have been found to be caused by the painless nature, elimination of the high frequency vibrations generated by the rotary conventional instruments and noncontact mode of lasers. Due to its versatility, Er:YAG is the most frequently used laser by paediatric dentists to treat both hard and soft tissues in the oral cavity. Genovese et al. have been investigated the subjective tolerance and acceptance of laser therapy in children needing both dental and soft tissue treatments.⁵³ The results show that the hard tissue therapy have been carried out without anaesthesia and with good collaboration of the patients in 90 per cent of the cases. While in the soft tissue therapy the acceptance has been presented in 62 per cent of the treated patients because of the more invasive nature of the procedure. The findings of this study show a total acceptance of 75 per cent of the treated cases. Hence, the comfort registered during the treatment contributes to a decrease of dental anxiety and makes laser techniques a very effective method in paediatric dentistry and a good treatment option for anxious patients. Fear of pain has been strongly linked to the development of dental anxiety and avoidance of dental treatment.⁵⁷

The application of Er:YAG lasers leads to a decrease of dental anxiety by eliminating the main component of the “vicious cycle of dental anxiety” which is pain, and the major stress trigger observing the “4S” rule which are high frequency vibrations. Thus, this technology offers new possibilities for an improved service of anxious patients in both children and their parents. Because nowadays many children may experience laser treatment as their first contact with dentistry, there is a possibility that a new generation of patients will grow up with a different attitude towards dentistry. Parents are also enthusiastic about being able to offer their children the advantages of laser care.⁵⁸

Phobic Patients

Dental phobia represents a severe type of dental anxiety, which is characterised by persistent fear of clearly discernible objects and situations and results in avoidance of necessary dental treatment or enduring treatment only with dread.⁴¹ Several studies report that 6–15

per cent of people avoid regular dental care because of dental anxiety and phobia.⁵⁹

The prevalence of general and specific phobias reduces with age.⁵⁹ The concept of the "vicious cycle" as mentioned previously is valid for adults and children and adolescents with dental phobia. Surprisingly, among different subtypes of phobias, the dental phobia is the most prevalent (3.7 per cent).⁵⁹ These findings should alert both researchers and dental practitioners with the objective to seek for ways of improving this condition. The Diagnostic and Statistical Manual of Mental Disorders distinguishes phobia from fear on the basis of the feared stimulus being avoided or endured with intense distress. Precisely those people report high dental fear, avoidance of visiting the dentist and significant social and functional impacts who meet the criteria for a dental phobia.⁴⁵

Er:YAG lasers can also be used in different paediatric soft tissue procedures, such as frenectomy, operculectomy, exposure of unerupted teeth, some oral pathological conditions including mucocoele, fibroma, haemangioma, herpes labialis and aphthous ulcers.^{3, 22, 60}

Conclusion

The clinical work with Erbium laser is minimally-invasive. Compared to the routine bur drilling where healthy tissue can also be removed, Erbium laser ablation has minimal penetration in hard dental structures. It prevents healthy hard tissues. It reassures bactericidal environment of the treated surfaces and prevents further carious development. Er:YAG is one of the best suited laser types for cavity preparation because of its efficiency, especially in dentin. In addition,

important pain reduction in comparison to bur-assisted preparation has clearly been demonstrated to make it possible working without local anaesthesia in most cases. Cavity preparation with Erbium laser has no smear layer and by using it a perfect marginal quality of the sealing material can be realised. Erbium laser can be used successfully in medically compromised children with special needs. As for the emotional side, Erbium laser has good acceptance and gives the opportunity for an attitude transference, providing right behaviour for prevention. Laser seems to be a promising solution for treatment on time and prevention. Reducing dental anxiety and forms of phobia by using laser therapy sometimes is the only possible way to prevent and treat paediatric patients.

The LiteTouch Er:YAG laser is suitable for minimally-invasive dentistry, and is an ideal tool for cavity preparation in both primary and permanent teeth and in soft tissue management in the field of paediatric dentistry.

Editorial note: A list of references is available from the publisher.

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Kurz & bündig

Bei der Anwendung weniger invasiver Prozeduren an der Zahnstruktur hat sich die moderne Zahnmedizin lange Zeit auf präventive Methoden und konservative Techniken konzentriert. Das Bewusstsein über die Notwendigkeit, Zahngewebe zu erhalten und eine patientenfreundliche Behandlung durchzuführen, ist mittlerweile selbstverständlich geworden. Eine operative Zahnbehandlung zieht weitere chirurgische und invasive Behandlungen nach sich. Wann immer möglich sollte jedoch Gewebe bewahrt und eine invasive Behandlung auf ein Minimum reduziert werden.

Für eine minimal-invasive Vorgehensweise eignet sich der Erbium-Laser. Verglichen mit dem routinemäßigen Bohrer, mit dem auch gesundes Gewebe entfernt werden kann, wird bei einer Erbium-Laser-Ablation nur minimal in die Hartzahnstruktur eingedrungen. Damit wird gesundes Hartgewebe bewahrt, das bakterizide Umfeld der behandelten Oberfläche sichergestellt und ein Schutz vor einer weiteren Kariesentwicklung gewährleistet. Verglichen mit einer bohrergestützten Präparation konnte bei der Laseranwendung eine deutliche Schmerzreduzierung beobachtet werden, was in den meisten Fällen eine lokale Anästhesie überflüssig macht.

Der Erbium-Laser lässt sich erfolgreich bei der Behandlung von Kindern mit „special needs“ anwenden und auch aus psychologischer Sicht stößt er auf große Akzeptanz. Der Er:YAG-Laser ist somit ein ideales Werkzeug für die minimal-invasive Zahnheilkunde und die Kavitätenpräparation sowohl bei Milchzähnen als auch im dauerhaften Gebiss und eignet sich hervorragend für das Weichgewebsmanagement im Bereich der Kinderzahnmedizin.

Conservative management of a large salivary calculus in the submandibular gland

Authors_Dr Habib Zarifeh, Dr Najwa Karam & Dr Nada el Osta, Lebanon

_Surgical management of salivary gland diseases has always been challenging because it carries a considerable risk of nerve damage, pain and complications. This case report presents an innovative ambulatory laser-assisted technique with the use of the Erbium laser (Er;Cr:YSGG, 2,780 nm) that could be an alternative method for removal of sialolithiasis.

_Introduction

Sialolithiasis is the most common disease of the major salivary glands. It affects 12 in 1,000 in the adult population. The great majority of salivary calculi (80 per cent) occur in the submandibular gland, mainly in the duct; 10 per cent occur in the parotid gland and the remaining 10 per cent in the sublingual and the minor salivary glands.¹ Calculi may be located in different positions along the salivary duct and gland. Submandibular stones close to the hilum of the gland tend to become large before they become symptomatic. Sialolithiasis occurs evenly on the right and left sides.² Males are affected twice more than females and there is a slight predilection for occurrence in males above the age of 40 years. Salivary calculi are usually unilateral and do not cause a dry mouth period.³ Clinically, salivary calculi are round or ovoid in shape with a rough or smooth surface and of a yellowish colour. They consist of mainly calcium, phosphate with smaller amounts of carbonates in form of hydroxyapatite, with minimal amounts of mag-

nesium, potassium and ammonia. This mix is distributed evenly throughout the calculus.⁴

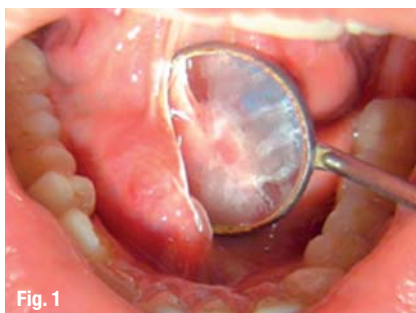
Sialolithiasis typically causes pain, discomfort and swelling of the involved salivary gland by obstructing the food related surge of salivary secretion. Calculi may cause stasis of saliva, leading to bacterial ascent into the parenchyma of the gland and therefore infection, pain and swelling of the gland. Long-term obstruction in the absence of infection can lead to atrophy of the gland with resultant lack of secretory function and ultimately fibrosis.⁴ Some may be asymptomatic until the stone passes forward and can be palpated in the duct or seen at the duct orifice. These can be managed conservatively by gentle massage. It may be possible that obstruction caused by large calculi is sometimes asymptomatic as obstruction is not complete and some saliva manages to seep through or around the calculus.⁵ Larger sialolithiasis may need to be managed by surgical removal of the stone itself when possible but if there is significant inflammation, the entire gland may need to be excised.⁶ Surgical management of salivary gland diseases has always been challenging because it carries a considerable risk of nerve damage, pain and complications. The development of additional conservative management techniques would be beneficial. This case report presents an innovative ambulatory laser-assisted technique with the use of the Erbium laser (Er;Cr:YSGG, 2,780 nm) that could be an alternative method for removal of Sialolithiasis.^{7,8,9}

_Patient

A fifty-year-old man consulted for possible implant placement in the left mandibular region. His medical history was unremarkable, his blood pressure and pulse rate were within normal limits, chest radiographs, electrocardiography, total blood count, urine sediment, liver and kidney function tests were also normal. Extra-oral examination revealed a palpable right sub-

Fig. 1 _Mass in the floor of the mouth.

Fig. 2 _Mandibular occlusal radiograph shows a submandibular salivary calculus.



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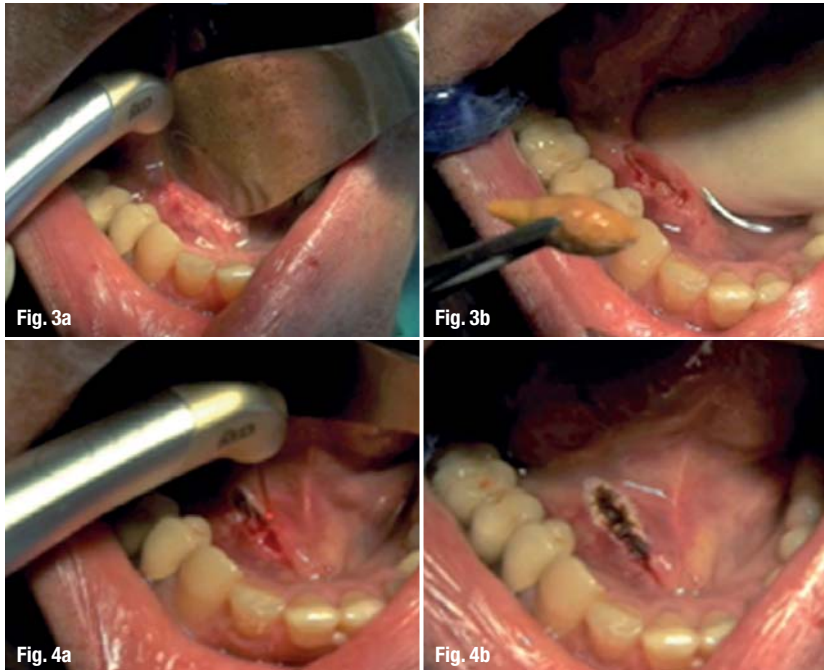
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Figs. 3a & b Laser incision in the floor of the mouth and removal of sialolithiasis.

Figs. 4a & b Laser bandage and post-op wound.

mandibular gland and bimanual intra-oral palpation of the floor of the mouth, in a posterior to anterior direction revealed a large, firm, non-tender swelling in the right anterior floor of mouth in the region of the submandibular duct. Intraorally, there was a large, asymptomatic, firm and non-tender swelling in the right anterior floor of mouth in the region of the submandibular duct (Fig. 1). The patient was unaware of swelling and only noticed it when it was pointed out by the dentist. A mandibular occlusal film and panoramic projection radiograph confirmed the diagnosis and showed a radiopaque structure in the right premolar region (Fig. 2). It measured approximately 1.5 cm along its greatest length.

Intervention

A diagnosis of the submandibular duct calculus was established and the decision to remove the stone using the Erbium laser (Er;Cr:YSGG, 2,780 nm)¹⁰ was made. The Er;Cr:YSGG, 2,780 nm has the possibility to be used in hard tissue and soft tissue by using long pulse duration of up to 600 ms with an appropriate amount of energy and an appropriate distance between the laser beam and the surface of the tissue. Thereby, the presence of

water particles layer of at least 1 mm can help with the selectivity of tissue ablation due to the explosive vaporisation phenomena. With pulse durations longer than the relaxation time of tissue, energy is lost to the interior of the tissue by conduction, increasing the energy needed to cause ablation. Topical anaesthetic gel (EMLA) was applied at site for five minutes and no injections were administered. The procedure consisted of locating the stone, isolating the duct from the surrounding tissues, introducing a button probe, ductal incision above the stone, sialolithotomy, and checking duct patency (Figs. 3a & b). The duct, together with the oral mucosa, was incised until the stone localised within the distal part of the Wharton duct in the floor of the mouth was visible using the Waterlase MD Er;Cr:YSGG laser at 2.5 W, 30 pps, S mode using the gold handpiece with the Z tip.¹¹ It was then removed and no bleeding occurred during this procedure due to laser hydrokinetic energy ablation. The closing of the connective tissue was controlled using the same 2,780 nm laser at 1.0 W, 0 per cent air, 0 per cent water, S mode (600 ms), using the gold handpiece with the Z tip, achieving the homeostatic effect¹² (also called laser bandage; Figs. 4a & b), no sutures were needed in this procedure eliminating by consequence the post-operative discomfort of the sutures in this particular sensitive site. The oral pathology report confirmed the pre-surgical clinical diagnosis (Fig. 5). No analgesics or antibiotics were required after the procedure. The patient was seen one week postoperatively to check salivary function of the gland (Figs. 6 & 7). The healing was uneventful and without any usual postoperative side effects such as scar formation, injury to the lingual nerves, swelling, pain, or inflammation since the Er;Cr:YSGG laser only cuts 5 to 10 cell layers deep and does not produce any histamine release, effectively blocking any inflammatory reaction.¹³ Wound healing was excellent and achieved rapidly.¹² Five years post-operative, no further abnormalities could be observed (Figs. 8a & b). On review, the right submandibular gland was palpable and clear saliva could be expressed from the duct. Patients should be seen in almost every six months to monitor the absence of recurrent lithiasis.

Discussion

There are various methods available for the management of salivary stones, depending on the gland

Fig. 5 The calculus shown to scale (1.5 cm).
Fig. 6 The laser bandage.
Fig. 7 One week post-operative.



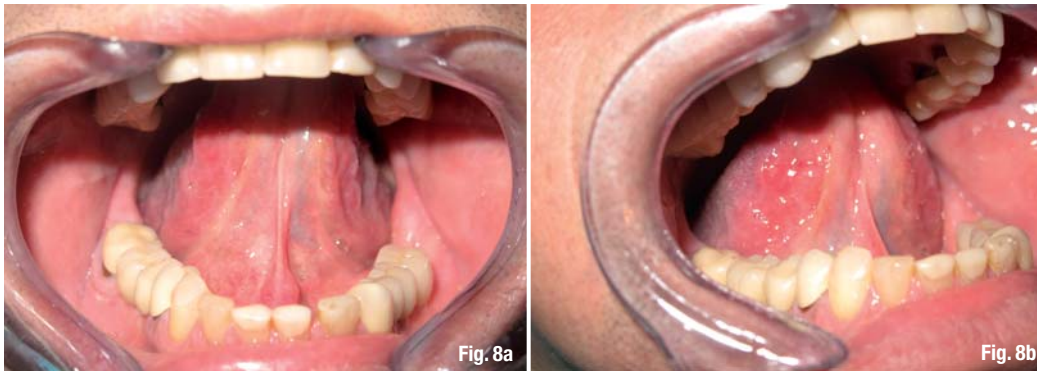


Fig. 8a & b Five years post-operative.

affected and the stone location.⁶ Surgical removal of the calculi is performed when located in the excretory duct near the opening. Er,Cr:YSGG laser has been widely used and replaced surgical interventions in selected patients. Its advantages are the relative absence of pain and the elimination of the need for an operation with its surgical risks. Er,Cr:YSGG laser use is a modern approach for the management of salivary calculi and treatment oral soft tissue lesions and should be considered as an alternative to conventional scalpel surgery. If the calculi are located in the gland itself, fragmentation can be performed by extracorporeal or endoscopic laser lithotripsy.

Conclusion

Patients should be educated regarding the mechanism of their underlying pathology and methods of

maintaining control over them by emphasising the value of hydration and excellent oral hygiene, which lessens the severity of the attacks and prevents dental complications. Once the diagnosis of a salivary gland stone is established attempts at removal by minimally invasive techniques should be considered.

Editorial note: A list of references is available from the publisher.

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Kurz & bündig

Sialolithiasis ist eine der häufigsten Erkrankungen in der großen Speicheldrüse, betroffen sind 12 von 1.000 Erwachsenen. Die Mehrheit der Speichelsteine (80 Prozent) treten in der Unterkieferspeicheldrüse auf, 10 Prozent in der Ohrspeicheldrüse und weitere 10 Prozent in Drüsen unter der Zunge und kleinen Speicheldrüsen.¹

Im Artikel wird der Fall eines 50-jährigen Mannes beschrieben, der eigentlich wegen einer möglichen Implantatplatzierung vorstellig wurde. Seine medizinische Geschichte war unauffällig, eine extraorale Untersuchung offenbarte jedoch eine spürbare Unterkieferdrüse auf der rechten Seite. Die beidhändige intraorale Abtastung des Mundbodens offenbarte eine große, feste, unempfindliche Schwellung auf der vorderen rechten Seite im Bereich des submandibulären Duktus (Abb. 1). Eine Aufnahme mandibulär okklusal und eine Panoramaschichtaufnahme zeigten eine radiopake Struktur im rechten Prämolarebereich (Abb. 2) mit einer Länge von 1,5 cm. Der diagnostizierte Speichelstein sollte mittels einer neuartigen, ambulanten lasergestützten Technik entfernt werden. Zur Entfernung der Sialolithiasis wurde der Erbium-Laser (Er,Cr:YSGG, 2.780 nm)¹⁰ verwendet.^{7, 8, 9}

Während der Behandlung wurde der Stein zunächst lokalisiert und der Duktus vom umgebenden Gewebe isoliert. Danach wurde eine Tastsonde eingeführt, ein duktaler Schnitt über dem Stein gemacht und eine Sialolithomie sowie eine Überprüfung der Duktusdurchgängigkeit durchgeführt (Abb. 3). Der Duktus zusammen mit der Mundschleimhaut wurde aufgeschnitten, bis der Stein sichtbar und dann entfernt wurde. Der Verschluss des Gewebes erfolgte ebenfalls mit dem Erbium-Laser (Abb. 4). Analgetika oder Antibiotika waren zur Nachbehandlung nicht mehr nötig. Der Bericht zur oralen Pathologie bestätigte die vorangegangene klinische Diagnose (Abb. 5). Eine Woche nach der Operation wurde die Funktion der Speicheldrüse überprüft (Abb. 6). Die Wundheilung erfolgte problemlos (Abb. 7 & 8). Insgesamt zeigt der Fallbericht, dass eine lasergestützte Behandlung einer Sialolithiasis eine Alternative zur konventionellen Chirurgie darstellt.

Laser-assisted osseointegration with a diode laser in Type I implant placement

Authors Dr Maziar Mir, Prof. Norbert Gutknecht, Dr Masoud Mojahedi, Dr Jan Tunér, Prof. Ramin Mosharraf & Dr Masoud Shabani, Germany, Sweden & Iran

_Implant placement is conventionally performed after healing of the extraction socket. However, with this method, undesirable outcomes can occur owing to the substantial period that elapses before clinicians can continue treatment, for example a reduction in bone level and the collapse of soft tissue. These unwanted results can compromise aesthetics in the anterior region significantly. Therefore, immediate (Type I) implant placement can be a golden opportunity to preserve the aesthetics. Fear of failure, especially in the case of an infected socket, is the greatest barrier to selecting Type I implant placement.¹⁻⁵

_Laser in implantology

Lasers have several applications in implantology, for example:⁶

- Recontouring of peri-implant soft tissue
- Sculpting of the emergence profile for prosthetic components
- Rising of surgical flaps
- Osseous recontouring
- Creation of parabolic tissue architecture
- Bone harvesting of block grafts
- Window preparation in sinus lift procedures
- Ridge splitting
- Debridement of extraction sockets for immediate implant placement.

Research reports show that the mineralisation of the socket may not be adequate after three months. Therefore, additional support to achieve the best bone density and better osseointegration after implant placement is needed, specifically in Type I implant placement.⁷ It appears that diode lasers have some potential benefits in helping clinicians to obtain the best results in implant placement into a fresh socket.

Fig. 1 Crown–root fracture.

Fig. 2 Diagnostic impression.

- Atraumatic uncovering of submerged implants to prevent crestal bone loss

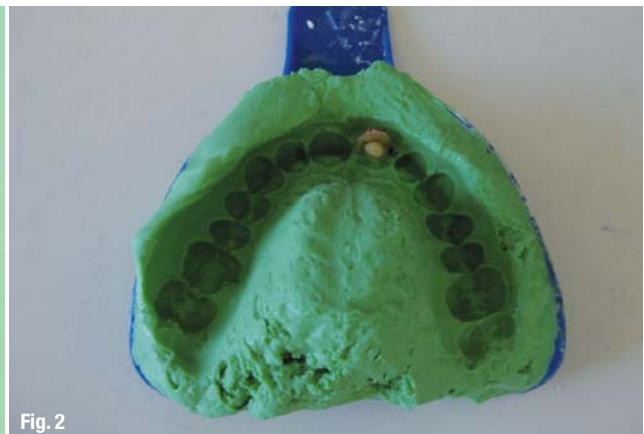
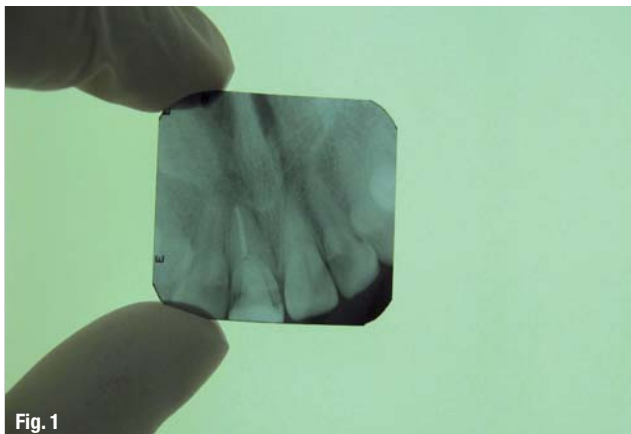




Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7

On the one hand, the high intensity of a diode laser can remove epithelial cells for 2 or 3 mm at the gingival crest and delay epithelial cell migration to the implant surface, preventing pocket formation around the implant and creating a sterile area for implant placement. On the other hand, a diode laser can often be set at a low output to perform biostimulation (low-level laser therapy, LLLT), accelerating the healing process. Laser-assisted osseointegration without the use of any bone substitutes is presented in this article.

Anamnesis and diagnosis

A 25-year-old female patient with the complaint of a right incisor fracture presented for treatment. The patient's medical history showed no systemic medical problems, no allergic reaction, no medicaments and no history of past surgical procedures, and thus it was not necessary to refer the patient for medical consultation.

An oral and maxillofacial examination of the patient found no temporomandibular joint or myofascial disturbances, as well as no functional or parafunctional habits, but a Class I occlusion and poor oral hygiene. As shown by the clinical findings, the tooth was infected and a crown-root fracture was obvious (Fig. 1). The apical area showed the orifice of a fistula, but there was no pain or swelling.

The radiographic examination showed a radiolucent lesion at the apical part of the involved teeth. The tooth was diagnosed as not worth preserving and thus the final decision was to perform an atraumatic extraction followed by dental implant placement (Fig. 2).

The consent form was completed and the patient's information was reviewed (examination sheet and radiograph, consent form, etc.). Thereafter, antibiotic prophylaxis was prescribed (penicillin V 500 mg, q.i.d., orally, starting one day before extraction).

Initial treatment

After the diagnosis, the treatment plan was to first extract the tooth and then accelerate wound healing

using a laser device. The surgical area was anaesthetised with infiltration of 1.8 ml of 2 per cent lidocaine with 1:100,000 epinephrine in order to perform an atraumatic tooth extraction. The controlled area was then defined and the laser warning signs placed properly to secure the operating room. Furthermore, eye protection was provided for the patient, as well as for the patient's guardian and the assistant.

Having extracted the tooth (Figs. 3 & 4), socket debridement and irrigation with normal saline were performed. The laser system was then calibrated in order to irradiate the treated area with a low-intensity laser (LLL) for acceleration of wound healing. The laser parameters were as follows: wavelength of 980 nm, output power of 1 W, irradiation time of 20 s, spot size of 3 mm, power density of 1.41 W/cm² at the end of the low-level handpiece, socket diameter of 8 mm, irradiation area of $\pi r^2 = 0.5024 \text{ cm}^2$, power density of 0.199 W/cm² at the target surface, dose of 3.98 J/cm², non-contact mode (1 mm from the orifice) and rotating at the orifice of the socket, single dose.

After the treatment, the patient was advised to keep the area clean and plaque free with gentle brushing, continue using the antibiotic and take over-the-counter analgesics as needed. The next visit was scheduled for one week after the initial treatment in order to perform the implant placement.

Implant placement

One week after the initial treatment, the implant was placed. After revision of the consent form and establishing safe laser delivery conditions, the surgical area was anaesthetised with infiltration of 1.8 ml of 2 per cent lidocaine with 1:100,000 epinephrine.

Fig. 3 Clinical view.

Fig. 4 Atraumatic extraction.

Fig. 5 De-epithelialization and implant site preparation.

Fig. 6 Implant placement without any bone substitutes.

Fig. 7 & 8 Two months after implant placement.



Fig. 8



Fig. 9



Fig. 10



Fig. 11

Fig. 9 Healing implant site two months after implant placement.

Fig. 10 Immediately after crown seating (ten weeks after implant placement).

Fig. 11 Six months after implant placement.

First, the laser system was recalibrated, which entailed cleaving of the fibre, aiming of the beam, and initiation of the fibre with articulating paper and test-fire of the laser, in order to create a hole at the socket orifice for starting the drilling and for de-epithelialisation of the attached gingiva for approximately 3 mm around the socket orifice. During the treatment, high-volume suction was used to evacuate the vapour plume and objectionable odours at the site of operation. The carbonised tissue was then removed with a micro-applicator brush soaked in a 3 per cent hydrogen peroxide solution.

The hole creation and gingival de-epithelialisation (Fig. 5) were performed with a 980 nm diode laser, with a power of 1 W, fibre of 400 μ , initiated fibre, continuous wave and in contact mode. After this procedure, the implant placement was performed (Fig. 6).

The laser parameters for the acceleration of the osseointegration were as follows: wavelength of 980 nm, output power of 0.1 W, irradiation time of 20 s, spot size of 3 mm, power density of 1.41 W/cm² at the end of the low-level handpiece, socket diameter of 8 mm, irradiation area of $\pi r^2 = 0.5024$ cm², power density of 0.199 W/cm² at the target surface, dose of 3.98 J/cm², non-contact mode (1 mm from the orifice) and rotating at the orifice of the socket.

Both the labial and palatal surfaces of the socket were irradiated at the same dose immediately after implant placement (the total dose for three sites in the first session was 11.94 J/cm²) and then twice weekly with the same protocol, but with an irradiation time of 15 s, consequently with a dose of 2.985 J/cm² (the total dose for three sites per session was 8.955 J/cm²). The LLLT was performed at intervals for two weeks.

Finally, a temporary bridge made of composite materials was fabricated and seated in order to preserve the aesthetics.

_Final result and follow-up

Excellent implant placement was observed with no bleeding, carbonisation or char. The primary stability of the implant was excellent. The patient did not experience any discomfort and was satisfied with the treatment.

The first visit after Type I implant placement was scheduled for two days after the procedure. The healing process was as expected in that the healing was progressing well and without any swelling or pain. LLLT was performed and the next visit was determined after two days for the next LLLT session two weeks later. Finally, after two months of follow-up, a suc-

successful treatment outcome was observed with excellent osseointegration and sufficient soft tissue to ensure the aesthetics at the site (Figs. 7–11).

Discussion

LLLT is used extensively in many dental practices.^{8,9} Laser–tissue interaction in LLLT is not photo-thermal.^{10, 11} This treatment is dose dependent^{12, 13} which means that the laser parameters have to be respected.¹⁴ The precise molecular mechanisms of LLLT are not well understood, but its clinical effects on pain control, inflammation reduction and wound healing have been well researched.^{15–17}

Diode lasers can be used for soft-tissue management in implantology.¹⁸ Our results in this case demonstrate that a diode laser can be applied in Type I implant placement in order to establish osseointegration successfully.

Gomes et al. have shown that LLLT enhances peri-implant bone repair, thereby improving stability and bone formation.¹⁹ De Vasconcellos et al. have reported that infrared LLLT may improve the osseointegration process in osteopenic and normal bone, particularly based on its effects in the initial phase of bone formation.²⁰

LLLT can promote implant stability and improve healing around the surgical site through increasing ATP synthesis and angiogenesis, reducing inflammation and increasing osteoblast proliferation.^{21–23} Furthermore, LLLT can improve the attachment of the fibroblast to implant surfaces²⁴ and promote osteoblast activity.²⁵

Conclusion

Based on the laser protocol applied in this study, the diode laser can be used in Type I implant placement with or without bone substitutes in order to achieve better osseointegration and implant stability.

Editorial note: A list of references is available from the publisher.

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Kurz & bündig

Konventionell wird eine Implantatplatzierung nach der Heilung der Extraktionsalveole vorgenommen. Mit dieser Methode kann es jedoch zu unerwünschten Resultaten kommen, wie einer Reduzierung des Knochenniveaus und einem Zusammenbruch von Weichgewebe, was auch die Frontästhetik sehr stark beeinträchtigen kann. Eine sofortige Implantatplatzierung (Typ I) kann dabei eine gute Möglichkeit sein, die Ästhetik zu bewahren.

Im Fallbeispiel wurde eine 25-jährige Frau mit einer Fraktur des rechten Schneidezahns vorgestellt. Die Anamnese offenbarte eine Okklusion der Klasse I sowie eine schlechte Mundhygiene. Der Zahn war infiziert und zeigte eine Krone-Wurzel-Fraktur (Abb. 1). Apikal war eine Fistelöffnung zu sehen, jedoch gab es keine Schmerzen oder Schwellungen. Eine radiologische Untersuchung zeigte eine strahlendurchlässige Verletzung im apikalen Bereich des betroffenen Zahns. Der Zahn wurde als nicht erhaltungswürdig diagnostiziert, und daher fiel die Entscheidung auf eine atraumatische Extraktion mit anschließender Implantatplatzierung (Abb. 2).

Nach der Zahnextraktion (Abb. 3 & 4) wurde die Wunde gesäubert und mit Kochsalzlösung ausgespült. Das Lasersystem wurde dann kalibriert, um den behandelten Bereich zur Beschleunigung der Wundheilung mit niedriger Intensität (LLLT) zu bestrahlen. Eine Woche später wurde das Implantat inseriert. Die Erstellung des Lochs und die gingivale Epithelisierung (Abb. 5) wurden mit einem 980 nm Diodenlaser durchgeführt. Im Anschluss wurde das Implantat platziert (Abb. 6). Abschließend wurde eine temporäre Kompositbrücke aufgesetzt, um die Ästhetik zu bewahren.

Nach einer zweimonatigen Follow-up-Periode mit regelmäßiger LLLT konnte ein erfolgreiches Behandlungsergebnis beobachtet werden mit einer exzellenten Osseointegration und ausreichendem Weichgewebe (Abb. 7–11).

Wie diese Studie zeigt, eignet sich ein Diodenlaser für eine Typ I-Implantatplatzierung mit oder ohne Knochenersatzmaterialien zur Erreichung einer besseren Osseointegration und Implantatstabilität.

Treatment of mucocele with the Er:YAG laser

A case report

Author_Foteini Papanastasopoulou, Greece

_Mucocele is a mucosal swelling due to a rupture of a salivary gland duct and accumulation of mucin in the surrounding soft tissue. It is a common lesion of the oral mucosa in children and young adults and often caused by local trauma. The size of the mucocele can range from 1 mm to a few centimetres and is asymptomatic. The most common area of appearance is the lower lip. Some mucoceles heal spontaneously after rupture. However, chronic lesions are treated by local surgical excision, cryotherapy and laser surgery.

The lesion was painless, fluctuant and round. The aetiology was an accidental bite of the lower lip three months ago. The presence of the swelling was causing difficulties in speaking and chewing for the patient. The medical and dental history was taken and the patient was examined clinically. The lesion was diagnosed as a mucocele (Fig. 1). The treatment of the mucocele was removal of the lesion. Removal with the use of an Er:YAG laser was the choice of treatment.

_Case report

A 13-year-old male patient visited the dental clinic with the complaint of a swelling on the lower

lip. The lesion was painless, fluctuant and round. The aetiology was an accidental bite of the lower lip three months ago. The presence of the swelling was causing difficulties in speaking and chewing for the patient. The medical and dental history was taken and the patient was examined clinically. The lesion was diagnosed as a mucocele (Fig. 1). The treatment of the mucocele was removal of the lesion. Removal with the use of an Er:YAG laser was the choice of treatment.

Figs. 1a & b_Clinical diagnosis.
Figs. 2a & b_Immediately after laser treatment.



Fig. 1a



Fig. 1b



Fig. 2a



Fig. 2b



and a pulse duration of $< 800 \mu\text{s}$ in soft-tissue mode, with a water spray (Level 5). The tip was 0.6 mm in diameter and 17 mm in length and was placed in contact with the tissue at a 50-degree angle. The procedure lasted for 3–5 minutes and no sutures were required (Fig. 2). Once the lesion had been removed, the incision site was pressed with sterile gauze and instructions were given to the patient to avoid acidic foods. No antibiotics were prescribed.

Clinical results

Postoperative clinical examination was performed a week later. The patient reported no postoperative pain or discomfort and had not used any analgesic medication. The wound healing of the lesion was good and without complications (Fig. 3). After a four-month follow-up, no recurrence or scar formation was observed (Fig. 4).

Conclusion

Laser surgery combines safety and effectiveness, which are beneficial for both patient and dentist. The comfortable and easy procedure without the need for sutures minimises patient anxiety and increases laser familiarisation in everyday clinical praxis. Additionally, the excellent wound healing and aesthetic outcome ensure the best treatment option for patients.

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Figs. 3a & b Healing after one month.

Fig. 4 Healing after four months.

Kurz & bündig

Unter einer Mukozele versteht man eine Schleimhautschwellung, die durch einen Riss des Speicheldrüsenkanals und eine Ansammlung von Mucin um das umgebende Weichgewebe verursacht wird. Eine solche Verletzung der Mundschleimhaut tritt besonders häufig bei Kindern und jungen Erwachsenen auf und kann oftmals auf ein lokales Trauma zurückgeführt werden. Einige Mukozelen heilen von alleine, bei chronischen Verletzungen kann eine lokale chirurgische Entfernung, Kältetherapie und Laserchirurgie Abhilfe schaffen.

Im vorliegenden Fall wurde eine 13-jährige Patientin behandelt, die mit einer Mukozele in der Unterlippe vorstellig wurde. Die Patientin hatte sich drei Monate zuvor auf die Unterlippe gebissen und die daraufhin resultierende Schwellung verursachte Schwierigkeiten beim Sprechen und Kauen. In einer drei- bis fünfminütigen Prozedur wurde die Verletzung unter Verwendung eines Er:YAG-Lasers entfernt. Das Nähen der Wunde oder eine Gabe von Antibiotika im Anschluss an die Behandlung waren nicht mehr nötig.

Die Untersuchung eine Woche nach der Operation zeigte eine gute Wundheilung ohne nennenswerte Komplikationen. Auch beim Follow-up nach vier Monaten wurde weder ein Rückfall noch eine Narbenbildung festgestellt.

Gerade solche kleineren Eingriffe sind eine gute Gelegenheit, den Laser in den Praxisalltag einzuführen. Die Laserchirurgie kombiniert Sicherheit und Effektivität, was sowohl für den Patienten als auch für den Zahnarzt von Vorteil ist. Die komfortable und einfache Prozedur macht eine Nahtlegung überflüssig und verringert Ängste aufseiten der Patienten. Zusätzlich stellt eine Laseranwendung durch die exzellente Wundheilung und das ästhetische Ergebnis eine gute Behandlungsoption für den Patienten dar.

Manufacturer News

Schneider Dental

Cutting-edge technology with comfort

Diode lasers in dentistry are more capable than most practitioners might think. However, the most important fact is that using the gadget should be intuitive and easy—despite multiple therapy possibilities. For little surgical interventions, the BluLase Mini by BluLase is the best way to perform.

The handy, pencil-shaped tool is light-weighted but full of energy: it has a maximum output power of 2.5 W in pulse mode, lower services of 0.7 W and 1.7 W are available as a continuous wave (CW) as well as 300 mW especially for photodynamic therapy. Only two buttons are sufficient to run the BluLase Mini, the feedback of the device takes place via a multi-coloured light-emitting diode, which informs the user about the set power. Thanks to the quick-change battery with a charging station, the BluLase Mini is continuously ready for use. Beside the classic diode laser indications, both BluLase 810 PDT and BluLase Mini were designed for the Photodynamic Therapy (PDT). A TBO-based dye



could be developed through extensive studies, which offers a high efficiency of laser wavelength of 810 nm. The focus in PDT lies on the endodontia, periimplantitis and periodontitis.

BluLase opines that even the best gadget cannot show its advantages without a professional instruction. Therefore, the sales and services were spun off exclusively to the dental company Schneider Dental in Pilsach, Germany. So instead of a mail sending the device is delivered personally and assembled locally, an extensive briefing by doctor and staff generally takes place before the handover. Additionally, the BluLase Academy by Schneider Dental offers trainings at regular intervals.

Schneider Dental/BluLase

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Fotona

Erbium laser with patented technologies

Fotona's booth at IDS allowed visitors to get a first-hand look at the company's award-winning LightWalker AT S dental laser. Renowned international dental laser experts were on hand around the clock at the company's booth to answer questions and demonstrate the laser's advanced capabilities, especially with difficult-to-treat conditions such as peri-implantitis.

The dental laser's state-of-the-art design, engineering and patented technologies have made it one of the world's fastest-cutting Erbium laser, outperforming even rotary burs in terms of speed and precision, while simultaneously offering a wide range of highly effective hard- and soft-tissue treatments. Typical procedures

with this laser are faster, easier to perform, less painful and require shorter healing times compared to conventional treatments.

The LightWalker AT system includes high-performance Er:YAG and Nd:YAG lasers, 20 W of power and Fotona's patented VSP and QSP pulse technologies for best possible performance and control during over a wide range of applications, from simple cavity preps to implantology and endodontics. LightWalker AT is also the first Erbium dental laser on the market with digitally controlled handpiece technology (X-Runner®), offering dentists new treatment possibilities and higher levels of precision.

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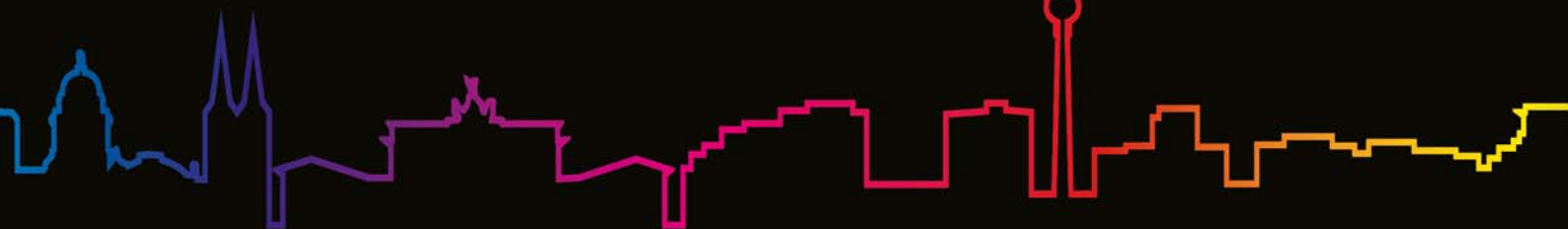




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The new BIOLASE: Practice growth 'assured'

Author_Sierra Rendon, USA

[PICTURE: ©SHUTTER_M]

— "The new BIOLASE."

You may hear or see that phrase this year and wonder, what exactly does that mean? In 2015, BIOLASE, a leader in the dental laser industry, has a new focus on placing customers first; new and improved products, such as the WaterLase iPlus and Epic X; and a new industry-first, ground-breaking Practice Growth Guarantee.

Orlando Rodrigues, Vice President and Chief Marketing Officer at BIOLASE, and Bill Brown, Marketing Director, spoke about the new products, concepts and future developments of the company.

its focus on any segment other than dental lasers. "We are essentially refocusing the direction of the company almost 180 degrees, one of our objectives we have now placed is that a minimum of 30 per cent of our revenue every year will come from new or improved products," Orlando Rodrigues, Vice President and Chief Marketing Officer, said.

This goes along with the company's new re-focus on placing customers first. "BIOLASE is not a business where we sell boxes and move onto the next customer," Rodrigues said. "Our commitment to the dental professional is the most important thing that we do."

New and improved products for the company include both the EPICMX and the WaterLase iPlus 2.0. "We just introduced a new diode laser, EPICMX, back in November, that is the result of a total focus on quality," Bill Brown, Marketing Director, said. "And [in February] in Chicago, we introduced the new WaterLase 2.0, which is a product upgrade offering significant improvements to uptime and functionality."

The other new concept BIOLASE is introducing is the Practice Growth Guarantee, which has never before been done in dentistry, Brown said.

— Lasers can make differences

Lasers can make a profound difference in the practice of dentistry. It is a market in need of improved clinical benefits, patient preference in terms of significant pain reduction and practice-growth opportunities for the company's primary audience, which is dentists. One of the first things down





“The **Practice Growth Assurance** commits to the dentists that **we are going to guarantee** them that they will **grow their practice.**”

The Practice Growth Guarantee

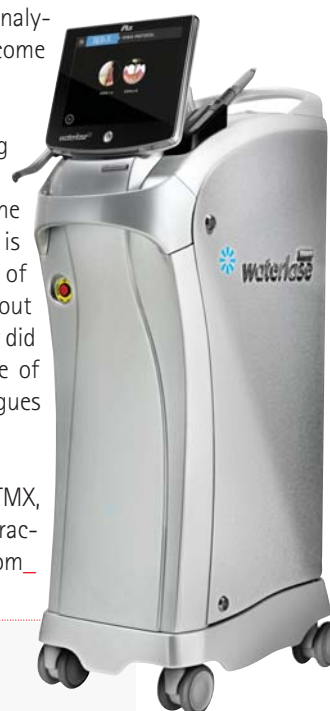
“The Practice Growth Assurance commits to the dentists that we are going to guarantee them that they will grow their practice by focusing on the seven core procedures that dentists have identified as the most important,” Brown said. “We assure them that we are going to work with them by providing practice-marketing materials and more training assistance, and with the increased ease of use of the WaterLase, it all works together to address that No. 1 need that we hear from dentists: growing their business. That is not to diminish the dentists’ focus on clinical outcomes and patient needs, but they are business people, and they want to build their practice.”

Practice growth could mean a number of different things, Brown said. It might mean more patients, it might mean more referrals or it might mean being able to treat many patients that before would’ve been

sent elsewhere. “We are partnering with the dentist and, in six months, if you have not grown your practice, we are going to come in and do an analysis and figure out why. And we will come back and give you more resources.”

BIOLASE believes that by enhancing patient experience, clinicians will automatically generate practice growth. “One of the things we are really focused on is making sure that dentists retain more of their patients and do not have to refer out anymore or not nearly as many as they did before because they are now capable of handling those procedures,” Rodrigues said.

For more information on the EPICTMX, the WaterLase iPlus 2.0 or BIOLASE’s Practice Growth Guarantee, visit BIOLASE.com



Kurz & bündig

2015 erfindet sich BIOLASE, einer der führenden Anbieter in der zahnärztlichen Laserindustrie, neu. Neu ist der Fokus des Unternehmens, der sich nun zuerst auf die Kunden richtet; neu und verbessert sind die Produkte, wie der WaterLase iPlus und der EPICTMX Diodenlaser; und neu ist eine noch nie vorher dagewesene Practice Growth Guarantee. Orlando Rodrigues, Vizepräsident und Chief Marketing Officer von BIOLASE, und Bill Brown, Marketing Director, sprachen über die neuen Produkte, Konzepte und die zukünftige Entwicklung des Unternehmens.

Das Unternehmen ist überzeugt, dass die Laseranwendung gerade auch für die Zahnmedizin viele Vorteile in der täglichen Anwendung bietet. Deshalb konzentriert sich das amerikanische Unternehmen nun ganz auf dentale Laser und den Zahnarzt selbst. Eines der Ziele ist es, mindesten 30 Prozent der jährlichen Gewinne aus neuen oder verbesserten Produkten zu generieren. Erst im November hat BIOLASE den Diodenlaser EPICTMX eingeführt und im Februar den WaterLase iPlus 2.0. Ein weiteres neues Konzept stellt das Unternehmen mit der Practice Growth Guarantee vor.

Mit dieser Garantie sichert BIOLASE seinen Kunden ein Praxiswachstum zu bei Konzentration auf sieben Prozeduren, die Zahnärzte als am wichtigsten identifiziert haben. Bei der Erreichung des jeweils individuellen Ziels zum Praxiswachstum unterstützt das Unternehmen die jeweilige Zahnarztpraxis mit Praxismarketingmaterial und Schulungshilfen sowie der erhöhten Benutzerfreundlichkeit des WaterLase. Die Garantie: Wenn sich nach sechs Monaten kein Erfolg eingestellt hat, führt das Unternehmen mit dem Kunden eine Analyse durch und stellt diesem weitere Ressourcen zur Verfügung.

Gain **power** at your **laser** clinics!

Process

Author _Dr Anna Maria Yiannikos, Germany & Cyprus

_Today, as a sequel of our previous articles we will introduce you to the last P of our 7 P's of Marketing Mix. With these series of articles my ultimate goal is to give dentists and dental professionals a basic guideline of the marketing options available which they can directly implement to their clinical routine. Starting with this easy strategy, I will teach you how you can implement these methods at your own clinic as well as understand their value and power and thus change your professional life.

The last P of the 7P's of Marketing Mix is Process. Actually, this refers to the process that our patients undergo before, during and after the treatment. Our ultimate goal is to add value to all the above three stages.

_Five factors

The above mentioned three stages are influenced by five crucial factors. The first factor is the culture of our patients. For example, Americans are more convinced about aesthetic dentistry than Cypriots and thus are more likely to undergo an aes-

thetic treatment. The second factor refers to our patients' social class. A patient from an upper social class might be more interested in a whitening treatment than a patient from a lower social class.

The third factor is the reference group. This means that our patients' decision to accept a treatment is influenced not only by psychological factors, personality and lifestyle, but also by the people around them, with whom they are interacting, and the various social groups to which they belong. The groups with whom they interact directly or indirectly influence our patients' decisions. If a patient for example knows a friend or a relative who has been treated with laser, he or she would be more attracted to do such kind of treatment than a patient who has no previous reference group.

The fourth factor refers to opinion leaders. There are three types of opinion leaders that are most commonly used: celebrities, experts and the 'common man'. For example, a patient might visit us because a famous star is one of our patients (celebrity), his GP referred him or her to us (expert) or he or she saw a testimonial from one of our pa-

services or products based on the need or on emotions—the so called internal motivation. On the other hand, we have the external motivation that we as dentists can offer to our patients by openly communicating the benefits of the laser treatment, for instance.

Decision making process

As I mentioned above, there are three stages that our patients go through during their decision making process to accept the treatment.

The first phase is the pre-purchase stage. In this phase, the patients are aware of their needs, they start to search for more information, through the internet, by asking friends or relatives and possibly visiting other colleagues of us. In this phase, our external marketing plays a very important role.

The next stage is the service-encounter stage. This second stage represents the moment when we are in direct contact with the patient; this has been termed as the 'moment of truth', which is our opportunity to influence the patient's perception of the service quality through our internal mar-



tients on our website / testimonial book ('common man'). Last but not least, there are psychological factors that determine our patients' behaviours. If they need the treatment, we have to ask ourselves: What is their perception, their attitude towards the treatment and finally, what are the patients' motives? Based on the Freudian theory, there is an existence of unconscious motives in the selection of

keting. The third and final stage is the post-purchase stage. It is the stage when the patients go to their houses, think about their treatment and evaluate us. In this stage, the patients' loyalty and intentions for referrals are created. They decide whether they are going to continue visiting us or not, whether we have met their expectations. They are either satisfied or we have not succeeded and



they are dissatisfied. Additionally, in this third stage cognitive dissonance might occur, a very normal situation in people, which is also known as doubt.

Furthermore, we can assure her that we would be next to her in the exceptional case of failure. Another possible way to reduce the cognitive dissonance is to remember our patient of the reference groups, e.g. people that have already been treated and are satisfied with us.

In the next issue of this magazine I will introduce a new series named "11 TIPS to gain desirable success in our dental clinics". Till then, you can always send me your questions and request further information and guidance at

dba@yiannikosdental.com or via our Facebook Account. Looking forward to our next trip of business growth and educational development!

For example, let's assume that Mrs. Smith has made ten veneers. She had chosen us after an extensive pre-purchase search and evaluation of alternatives. When she saw her new smile she was so excited! However, when she went home her next door neighbour said: "What on earth have you done! You have spent so much money just for your smile during this economic crisis!" So, Mrs Smith's level of dissonance could be very substantial indeed.

And then Mrs Smith comes to us full of anxiety about her decision. Some of which we can do in this moment is to reassure her of the success of the method she has chosen and that there are war-

contact



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Kurz & bündig

Im finalen Teil dieser Serie wird das letzte P im 7 P's of Marketing Mix vorgestellt: der Prozess. Dieser beschreibt die Entscheidungsfindung des Patienten für oder gegen eine weiterführende Behandlung und umfasst drei Phasen, nämlich vor, während und nach der Behandlung.

Diese Phasen werden von fünf Faktoren beeinflusst. Erstens dem kulturellen Hintergrund des Patienten: Ein Amerikaner ist für eine ästhetische Zahnbehandlung beispielsweise zugänglicher als ein Zypriote. Der zweite Faktor bezieht sich auf den sozialen Status: So interessiert sich ein Patient aus einer höheren sozialen Schicht vielleicht mehr für eine Zahnaufhellung als ein Patient aus einer niedrigeren. Ein dritter Faktor stellt die Referenzgruppe dar: Ein Patient, der bereits auf die Erfahrung von Bekannten oder Freunden zurückgreifen kann, wird sich eher für beispielsweise eine Laserbehandlung entscheiden als jemand, der keine solche Referenzgruppe hat. Der vierte Faktor umfasst die Meinungsbildner. Hier sind drei Gruppen zu nennen, die eine Patientenentscheidung beeinflussen: prominente Persönlichkeiten, Experten und der „Normalbürger“, letzterer trägt zur Meinungsbildung durch Bewertungen auf der Praxiswebsite oder mündliche Empfehlungen bei. Zu guter Letzt bestimmt auch noch die Psychologie über das Patientenverhalten. Hier können unbewusste Motive des Patienten zur Entscheidungsfindung beitragen.

Diese fünf Faktoren spielen eine wichtige Rolle im dreistufigen Entscheidungsprozess. In der ersten Stufe – vor der Behandlung – ist das externe Marketing der Praxis entscheidend; der Patient holt sich Informationen beispielsweise über das Internet oder durch Empfehlungen ein. In der nächsten Stufe entsteht der direkte Kontakt zwischen Patient und Behandler. Hier lässt sich der Entscheidungsprozess des Patienten durch internes Marketing, d.h. Servicequalität, beeinflussen. Die letzte Stufe beschreibt die Zeit nach der Behandlung, wenn der Patient die Praxis verlässt, über die Behandlung nachdenkt und entscheidet, ob er wiederkommt oder nicht. In dieser Stufe können Zweifel aufkommen. Hier kann der Behandler die Ängste des Patienten durch Zusage von Hilfe bei evtl. Problemen nach der Behandlung etc. und durch positive Referenzen beseitigen.

In der nächsten Ausgabe beginnt eine neue Serie. Hier wird die Autorin 11 Tipps geben, wie sich wünschenswerter Erfolg in der Zahnarztpraxis erzielen lässt.



PROFESSIONAL MEDICAL COUTURE



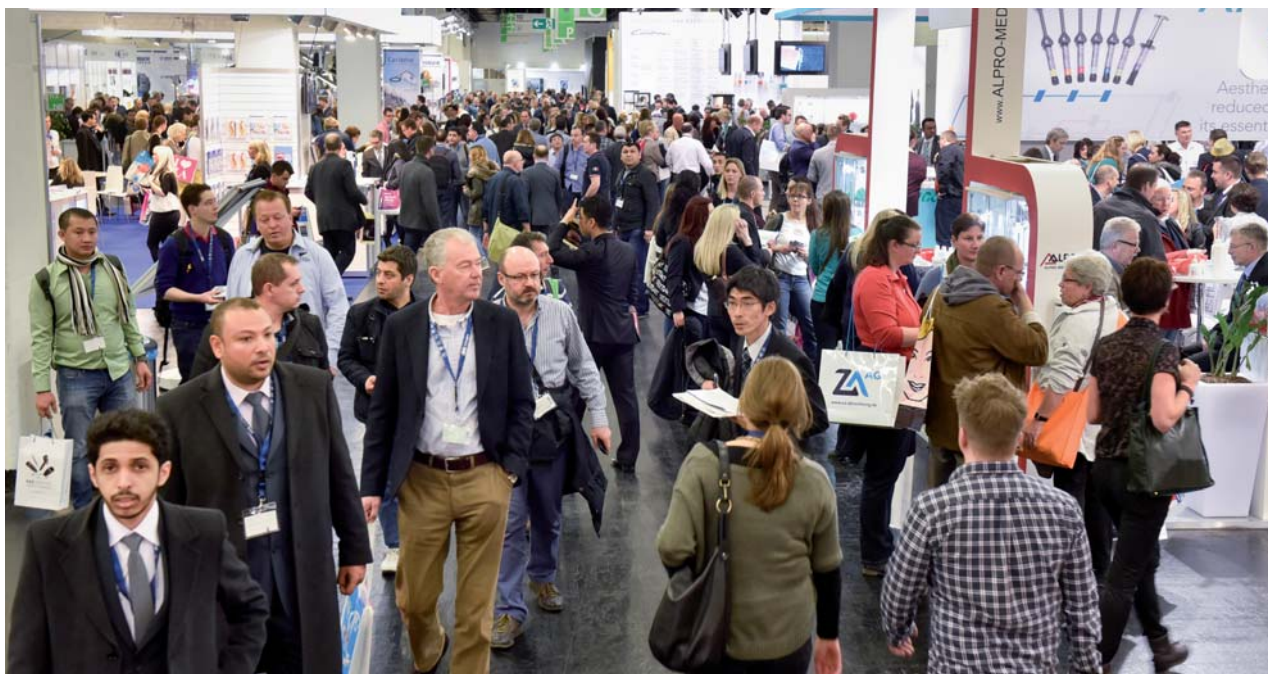
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Biggest IDS of all time in Cologne

Growth in the number of visitors, exhibitors and exhibition space

Author_Koelnmesse



After achieving a record result, the 36th International Dental Show (IDS) that was characterised by an excellent atmosphere closed its doors in Cologne after five days. Around 138,500 trade visitors from 151 countries attended the world's leading trade fair of the dental industry, which corresponded to an increase of almost eleven per cent compared to the previous event. IDS also achieved new records in terms of the number of exhibitors and the exhibition space sold. 2,201 companies (+6.9 per cent) from 56 countries presented a wealth of innovations, product developments and services on exhibition space covering 157,000 square meters (+6.2 per cent). With an over 70 per cent share of foreign exhibitors (2013: 68 per cent) and a 17 per cent increase in the number of trade visitors from abroad the level of internationality of the event was once again significantly increased. At the same time, the number of trade visitors

from Germany also increased markedly in comparison to 2013 (+4.3 per cent).

"We succeeded in making the International Dental Show in Cologne even more attractive, on both a national and international basis. It is thus the most successful IDS of all time," summed up Dr Martin Rickert, Chairman of the Association of German Dental Manufacturers (VDDI). "The quality of the business contacts between the industry and the trade as well as between the industry, dentists and dental technicians was extremely high. The number of orders placed at IDS rose once again and we are reckoning with sustainable impulses for the post-fair follow-up business," added Katharina C. Hamma, Chief Operating Officer of Koelnmesse GmbH. Furthermore she said: "In addition to the growth in the number of German trade visitors, the high international response once again underlines the char-

acter of IDS as the world's leading trade fair of the dental industry. The International Dental Show particularly recorded strong growth in the number of visitors from the Near and Middle East, the United States and Canada, Brazil as well as from China, Japan and Korea. The business in the South East European market, especially Italy and Spain, has also increased noticeably."

Strong interest in innovations

The trade and the users were extremely interested in innovative products and technologies. "In this respect, staged every two years, IDS fits in perfectly with the innovation cycles of the industry regarding the development and further development of products, materials and services," emphasised Dr Markus Heibach, Executive Director of VDDI. "This applies for both breakthrough innovations and further developments of existing products, but also for development progress in smaller phases that are however significant in terms of quality."

IDS 2015 focused on the intelligent networking of components for computer-controlled dentistry. Today, the world of digital systems in diagnostics and production encompasses the entire workflow from the practise through to the laboratory. The computer-controlled process chains are in the meantime complete and are putting their enormous flexibility to use.

Fantastic outcome of the trade fair and excellent mood

The hustle and bustle in the halls made the high attendance at IDS very apparent. By all accounts, representatives from all relevant professional groups—from dentists' surgeries, dental laboratories, from the dental trade, but also from the higher education sector—from all over the world had visited the exhibition stands. The exhibitors were especially pleased about the high level of internationality of the trade visitors. In terms of business, IDS was very successful for many companies, because orders were placed—by both national and international customers. Numerous companies were pleased to announce full order books. Aspects such as grooming contacts, customer bonding, winning over new customers or penetrating new foreign markets were at least equally important for the exhibitors. These goals were also achieved to complete satisfaction at the 36th International Dental Show. The exhibitors evaluated the quality of the visitors very positively. This finding is confirmed by the initial results of an independent visitor survey: 83 per cent of all of the visitors are involved in purchasing decisions at their company.

"The world meets up at IDS in Cologne," summed up Sebastian Voss, managing partner of Hager &



Meisinger GmbH. "More international customer contacts visited our stand this year than in 2013. Visitors from Latin America were particularly well represented, but also from Asia. "We were able to establish countless new contacts at IDS and also met up with our existing customers." Martin Dürrstein, Chairman of Dürr Dental AG, was also extremely satisfied: "The trade fair went very well for us, it was fantastic. We received a high number of particularly qualified trade visitors. We are totally satisfied with the fair, because we were able to welcome many new customers from Asia, Arabia, Latin America and South Africa."

Christian Scheu, Executive Director of Scheu-Dental GmbH also praised the further increased internationality of IDS: "In comparison to 2013, we were able to further increase the number of visitors at our stand, in particular visitors from abroad. The Asiatic region, for instance China and Korea, were especially well represented, but we also registered an increase in the number of customers from Southern Europe." As well as the high frequency of visitors at his stand, Axel





Klarmeyer, Executive Director of BEGO, also reported, "that the customers were well informed and that they showed great interest in new technologies."

Walter Petersohn, Vice President Sales of Sirona Dental Systems, was also pleased "about the vast numbers of international visitors, the buying interest and as always about the large number of attending German dentists and dental technicians." Michael Tuber, Executive Director of A. Titan also awarded IDS 2015 top marks. "This is the seventh time we have exhibited at IDS and we have optimally achieved the goal we set ourselves, namely further expanding our international sales network. The trade fair offers us the perfect platform for meeting up with our existing customers from all over the world, but at the same time, we were able to

establish many new customer contacts. This is why the International Dental Show is an absolute must for every American manufacturer from the dental industry."

IDS 2015 was also a success for Andrew Parker, CEO of Mydent International: "We met up with our international customers here in Cologne and were additionally able to make over 100 interesting new contacts to dental dealers. No other event in the world has such international appeal."

Satisfied visitors all round

The visitor survey revealed that over 75 per cent of the respondents were (very) satisfied with IDS. The fair's comprehensive spectrum of products and new products ensured that 81 per cent of visitors rated the product range as being (very) good. 74 per cent of the exhibitors were (very) satisfied in terms of reaching the goals they had set themselves for the fair. Overall, 95 per cent of the visitors questioned would recommend visiting IDS to business partners and 77 per cent also intend to visit IDS 2017. The International Dental Show (IDS) takes place in Cologne every two years and is organised by the GFDI Gesellschaft zur Förderung der Dental-Industrie mbH, the commercial enterprise of the Association of German Dental Manufacturers (VDDI) and is staged by Koelnmesse GmbH, Cologne.

The next IDS—the 37th International Dental Show—is scheduled to take place from 21 to 25 March 2017.

www.ids-cologne.de

Kurz & bündig

2015 war ein Rekordjahr für die nunmehr 36. Internationale Dental-Schau (IDS) in Köln: Rund 138.500 Fachbesucher aus 151 Ländern besuchten die Weltleitmesse der Dentalbranche, was einer Steigerung von fast elf Prozent im Vergleich zur Vorveranstaltung entspricht. 2.201 Unternehmen (+ 6,9 Prozent) aus 56 Ländern präsentierten auf 157.000 Quadratmetern (+ 6,2 Prozent) eine Vielzahl an Innovationen, Produktweiterentwicklungen und Services.

„Es ist uns gelungen, die Internationale Dental-Schau in Köln sowohl national als auch international noch attraktiver zu machen. Damit ist sie die erfolgreichste IDS aller Zeiten“, bilanzierte Dr. Martin Rickert, Vorstandsvorsitzender des Verbandes der Deutschen Dental-Industrie (VDDI). „Die Geschäftskontakte zwischen Industrie und Handel sowie zwischen Industrie, Zahnärzten und Zahntechnikern waren von hoher Qualität geprägt. Die Ordertätigkeiten auf der IDS sind erneut gestiegen und auch für das Nachmessegeschäft rechnen wir mit nachhaltigen Impulsen“, ergänzte Katharina C. Hamma, Geschäftsführerin der Koelnmesse GmbH.

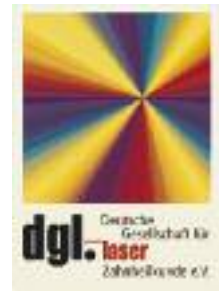
Im Vordergrund der IDS 2015 stand die intelligente Vernetzung von Komponenten für die computergestützte Zahnheilkunde. Die Welt der digitalen Systeme in Diagnostik und Fertigung umspannen heute den gesamten Workflow von der Praxis bis ins Labor. Die computergestützten Prozessketten sind inzwischen komplettiert und spielen nun ihre enorme Flexibilität aus. Eine Besucherbefragung ergab, dass mehr als 75 Prozent der Befragten mit der IDS (sehr) zufrieden waren. Das umfassende Produktspektrum und zahlreiche Produktneuheiten sorgten dafür, dass 81 Prozent das Ausstellungsangebot mit (sehr) gut bewerteten. Mit der Erreichung ihrer Messeziele zeigten sich 74 Prozent (sehr) zufrieden. Insgesamt würden 95 Prozent der befragten Besucher Geschäftspartnern den Besuch der IDS empfehlen und 77 Prozent planen, die IDS auch 2017 zu besuchen. Der Termin für die nächste Veranstaltung steht bereits fest: Die 37. Internationale Dental-Schau findet vom 21. bis 25. März 2017 in Köln statt.

Return address

Deutsche Gesellschaft für Laserzahnheilkunde e.V.
c/o Universitätsklinikum Aachen
Klinik für Zahnerhaltung
Pauwelsstraße 30
52074 Aachen, Germany

Tel.: +49 241 8088164
Fax: +49 241 803388164
Credit institute: Sparkasse Aachen
IBAN: DE56 3905 0000 0042 0339 44
BIC.: AACSD33

Membership application form



Name/title: _____
Surname: _____
Date of birth: _____
Approbation: _____

Status: ☐ self-employed ☐ employed ☐ civil servant ☐ student ☐ dental assistant

Address: Practice/office/institute (delete as applicable)

ZIP/city: _____ Street: _____
Phone/fax: _____ Email: _____
Private/place: _____ Street: _____

Due to an association agreement of DGL and DGZMK, an additional reduced annual fee for DGZMK is charged (85 EUR p.a. if you are not yet a member of DGZMK). The contribution collection is made by the DGMZK office, Liesegangstr. 17a, 40211 Düsseldorf. You will be addressed hereby.

With the application for membership I ensure that

- ☐ I am owing an own practice since _____ and are working with the laser type _____ (exact name)
- ☐ I am employed at the practice _____
- ☐ I am employed at the University _____

I apply for membership in the German Association of Laser Dentistry (Deutsche Gesellschaft für Laserzahnheilkunde e.V.)

Place, date

Signature

Annual fee: for voting members with direct debit €150

In case of no direct debit authorisation, an administration charge of €31 p/a. becomes due.

DIRECT DEBIT AUTHORISATION

I agree that the members fee is debited from my bank account

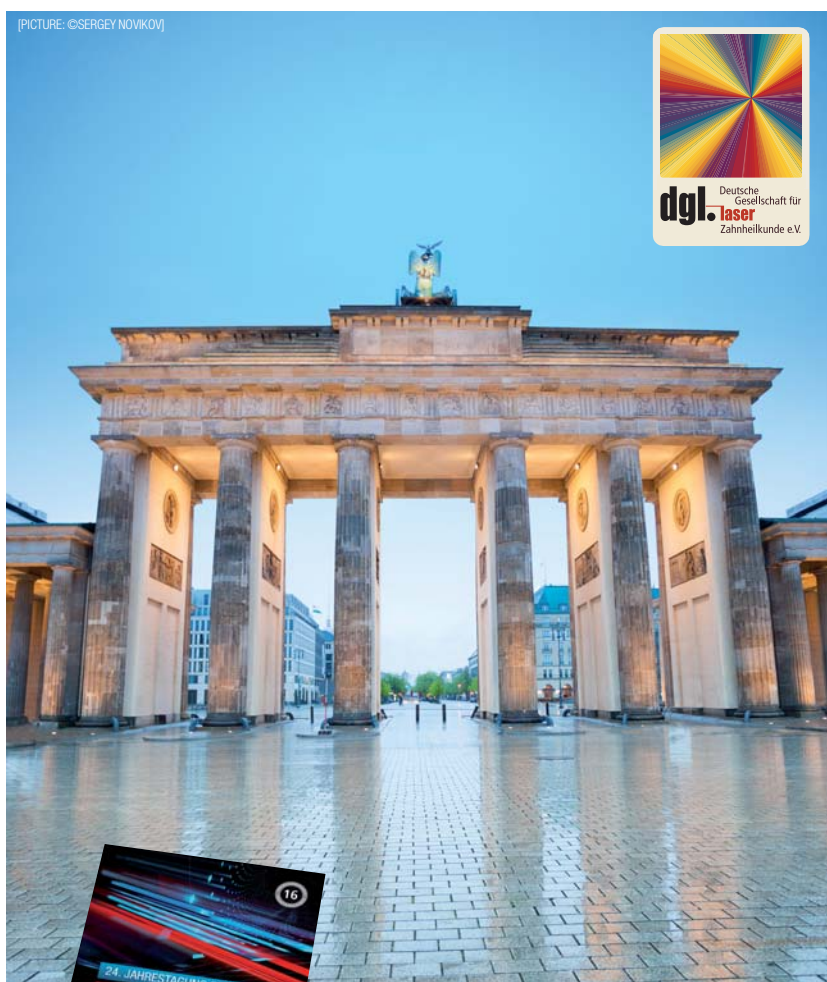
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BIC: _____ Credit institute: _____

Signature of account holder

This declaration is valid until written notice of its revocation

The DGL invites to its 24th International Annual Meeting

[PICTURE: ©SERGEY NOVIKOV]



[PICTURE: ©MAXGER]

from 27 to 28 November 2015 in the Hotel Palace in the city of Berlin. The event is held in collaboration with the 3rd Oral Hygiene Day, the 12th Annual Meeting of the DGKZ, and the 7th International Congress of Aesthetic Surgery and Cosmetic Dentistry (IGÄM) and the 4th Nose, Sinus & Implants.

The programme schedule enables the involved companies to offer active participation in the congress, i.e. in the form of workshops. By combining the various meetings, the request of many exhibitors will be met by providing access to a high number of participants. The expected attendance is around 400 participants.

The congress president and scientific director of the 24th International Congress of the DGL and LASER START UP is Prof. Dr Norbert Gutknecht of the RWTH Aachen University Hospital.

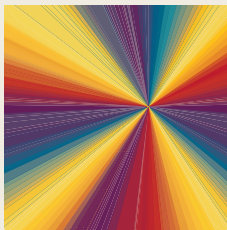
The objective of the LASER START UP Congress is to introduce dentists to the use of lasers in dentistry and in this context to give an overview of the relevant lasers for dental applications and the respective manufacturers. The focus group of the annual meeting of the DGL is expert users of laser technology from at home and abroad, from the dental offices and the universities.

The laser market can currently be viewed as very positive—this is reflected in a wide range of modern and highly efficient new laser systems. The effort to further integrate laser dentistry into the individual disciplines, such as implantology, periodontics or endodontics, the acceptance of lasers in dentistry will be even more successful.

The joint conference of the 24th International Annual Meeting of the DGL and LASER START UP is

For further information please visit www.dgl-online.de and www.oemus-media.de





Call for papers

DGL | German Society for Laser Dentistry
24th International Annual Congress

27 to 28 November 2015 in Berlin, Hotel Palace, Germany

Abstract (max. 250 words in Times New Roman, 11 pt.)

[illegible]

Session:

- (1) Scientific session
- (2) Case presentation

Presentation:

- (1) Lecture
- (2) Poster presentation
- (3) Video presentation

Abstract:

Please arrange the text in the order of:

- **Purpose:** Give a brief overview of the topic and in this context state the main objective of the study.
- **Material and Methods:** Describe the basic design, subjects and scientific methods.
- **Results:** Give main results of the study including confidence intervals and exact level of statistical significance, whenever appropriate.
- **Conclusion:** State only those conclusions supported by the data obtained and whenever appropriate, the direct clinical application of the findings (avoid speculations).

Authors:

The name of the person presenting the paper should be marked by an asterisk.
Please include a copy on CD!

Presentation:

Only via computer/beamer

For more information:

Prof. Dr Norbert Gutknecht, Universitätsklinikum Aachen,
Klinik für ZPP/DGL, Pauwelsstraße 30, 52074 Aachen, Germany
Tel.: +49 241 8088164, Fax: +49 241 803388164
E-Mail: sekretariat@dgl-online.de

Please send in your abstract until 30 June 2015

Er:YAG laser irradiation

Effects on bacteria communication

The Biofilm Research Laboratory, Institute of Dental Sciences in collaboration with the Department of Endodontics at the Hebrew University-Hadassah School of Dental Medicine in Jerusalem, Israel, has been researching "Laser irradiation effects on cell-to-cell communication" since the incorporation of the LiteTouch Er:YAG laser in the University. The research findings suggest a possible effect of laser irradiation on bacteria's quorum sensing cascade, essentially disrupting cell-to-cell communication and bio-film formation. As far as has been known yet this is a novel discovery, which had not been documented before. The research team is led by renowned key opinion leaders and users of the LiteTouch Er:YAG laser such as Idan Redenski, BSc,



Sharonit Sahar-Helft, DMD, Adam Stabholz, DMD, Reuven Aharoni, PhD, and Doron Steinberg, PhD.

"This previously undetected interaction between Er:YAG laser and bacteria opens a new field of clinical applications for the LiteTouch," Claudia Yoel, Marketing projects Manager at Syneron Dental Lasers, said.

Following a presentation of this research at IADR, the Hebrew University team won in the first place of the European IADR Robert Frank Award. The International Association for Dental Research (IADR), headquartered in Alexandria, Virginia, US, is a non-profit organisation with nearly 11,000 members worldwide.

Growing and ageing population drives

Australian's dental industry

IBISWorld, an independent research firm, has recently updated its report on the dental service industry in Australia. It found that ageing and the country's growing population have driven the industry over the past five years, particularly as the oral care of older people has increasingly improved and they have retained their natural teeth. The report further indicates that the dental services industry has grown over the past five years owing to a considerable increase in individual expenditure on dental services. According to IBISWorld industry analyst David Whytcross, growing private health insurance coverage has also benefited the industry, as patients are willing to visit their dentist more regularly and undergo procedures that are more expensive. Therefore, industry revenue is expected to rise through the 2014–2015 period to reach A\$9.4 billion. Similar trends are expected over the next five years, as a growing number of older Australians will require dental work and owing to a greater willingness to take up



[PICTURE: ©RUSLAN GUZOV]

private health insurance extras to subsidise out-of-pocket dental costs. Furthermore, policy interventions have affected the industry. Whytcross explained that initiatives such as the Medicare Chronic Disease Dental Scheme and the Medicare Teen Dental Plan enabled many patients who could not afford to pay for dental care to maintain their oral health by entitling them to dental visits to public clinics and the provision of vouchers for private clinics.

Dental plaque can be used for

Disease prediction and treatment

Researchers from Canada have suggested that dental plaque, a bacterial biofilm formed on dental surfaces, can be used to predict, identify and treat diseases. In a recently established laboratory, they collect and analyse plaque samples to screen for biomarkers that correlate with certain oral and systemic conditions, such as diabetes.

In particular, the researchers scan for the 16S rRNA gene, which is unique to each bacterial type, yet present in all bacteria and can thus be used to distinguish individual species. Plaque analysis only takes a few hours, and the results help the scientists determine disease risk and shed light on the effectiveness of a specific treatment rapidly. The research is being conducted at the recently formed Oral Microbiome and Metagenomics Research Laboratory at the University of Toronto's Faculty of Dentistry. It is



currently focused on plaque as a source of microbiological biomarkers for disease, but aims to study biomarkers for inflammation, for example. In the future, the laboratory's work could also benefit head and neck cancer patients undergoing radiation therapy, which often damages oral mucosa and salivary glands, the researchers believe. With the development of plaque transplantation therapies, for instance, healthy plaque samples could help stabilise bacterial content in the mouth and effectively protect teeth without the use of chemicals, operations or other invasive procedures.

After 50 years US need to

Lower fluoride in drinking water

US health authorities have updated their guidelines for fluoride in drinking water and now recommend an optimal fluoride concentration of 0.7 mg/l. As Americans today have greater access to fluoride in the form of toothpaste and mouthrinse and owing to the increasing incidence of fluorosis due to excess fluoride, the Department of Health and Human Services sought to replace its recommendations that were issued in 1962.

Since the early 1960s, the practice of adding fluoride to public drinking water systems has grown steadily in the US. Nearly all water fluoridation systems in the US have used fluoride concentrations ranging from 0.8 to 1.2 mg/l. With the recent update, however, this will be reduced by 0.1–0.5 mg/l, and fluoride intake from drinking water alone will decline by approximately 25 per cent. The total fluoride intake will be reduced by about 14 per cent. According to the department's report issued on April 27, the new optimal concen-



tration of 0.7 mg/l was chosen to maintain caries prevention benefits, but reduce the risk of dental fluorosis. Today, nearly 75 per cent of Americans who are served by public water systems receive fluoridated water. In 2012, the Centres for Disease Control and Prevention estimated that approximately 200 million people in the US were served by 12,341 community water systems that added fluoride to water or purchased water with added fluoride from other systems.

Dental researchers to complete

HIV test for use in developing world



After having achieved promising results in the first test phase, researchers in New York, USA, have received a new grant from the National Institutes of Health to complete the development of a rapid blood and saliva test for HIV/AIDS. They believe that the time- and cost-saving device will particularly benefit people in remote geographic areas with only limited access to advanced diagnostics. In total, the

project received a \$1.5 million Small Business Innovation Research Phase II grant, which will be used to develop a commercial-ready fully automated system that can simultaneously detect HIV/AIDS antibodies and viral RNA from the AIDS virus in a single specimen.

The primary aim of the project is to simplify HIV testing and eliminate the need for multiple patient visits to health providers. The grant was awarded to Rheonix, a New York-based company specializing in the design of automated, customizable molecular diagnostic devices. In collaboration with dental experts at the New York University College of Dentistry, the company successfully performed an initial test of its Rheonix CARD cartridge system. The system, which is the size of a smartphone, is a disposable card that acts as a receptacle for blood or saliva samples. The card is then placed on an instrument that carries out all of the required steps in processing the sample. According to the researchers, the entire testing process takes less than one hour and the device is mobile and can be battery operated.

BBC Research reports

Healthy Growth for the medical laser market

During the next five years, the medical laser market should enjoy healthy growth, bolstered by growing consumer demand for elective laser procedures. Combined with advances in medical laser technology, along with development of new applicators and tool holders that will widen the range of applications, this industry should rebound impressively from the economic downturn.



The global market for medical laser devices was at nearly \$3.7 billion in 2013. This market is expected to increase from more than \$4.1 billion in 2014 to nearly \$7.8 billion in 2019, with compound annual growth rate (CAGR) of 13.6 per cent over the five-year period from 2014 to 2019.

BCC Research examines the medical laser devices industry in its report, Global Markets and Technologies for Medical Lasers. The report addresses the global market for lasers used in diagnostic, therapeutic, and cosmetic applications during the period from 2013 through 2019. It addresses the market in its entirety as well as in selected regional and country markets.

**SAVE
THE DATE**

27. und 28. November 2015
in Berlin
Hotel Palace

24. JAHRESTAGUNG DER DGL

LASER START UP 2015



www.dgl-jahrestagung.de



www.startup-laser.de

Faxantwort

+49 341 48474-290

Bitte senden Sie mir das Programm zur/zum

☐ 24. JAHRESTAGUNG DER DGL ☐ LASER START UP 2015

am 27. und 28. November 2015 in Berlin zu.

Name/E-Mail-Adresse

Praxisstempel

laser 2/15



Prof. Dr. Norbert Gutknecht
Editor-in-Chief

Wellenlängen

Liebe Kolleginnen und Kollegen,

so wie das Sonnenlicht aus den unterschiedlichsten Wellenlängen besteht und auch nur in dieser Zusammensetzung unterschiedlicher Wellenlängen die vitalen biologischen Anforderungen bedienen kann, so müssen auch zukunftsorientierte Laseranwender verstehen lernen, dass die Anwendung einer Wellenlänge zwar sehr wichtig und gut sein kann, dieselbe Länge aber nicht alle biologischen und therapeutischen Anforderungen erfüllt. Die Laserzahnheilkunde der Zukunft wird deshalb mit der gezielten Kombination von Wellenlängen assoziiert sein.

Mit der Auswahl der richtigen Wellenlänge ist der Erfolg oder Misserfolg einer Laserbehandlung untrennbar verbunden. Je besser die biophysikalischen Kenntnisse des Laseranwenders sind, desto gezielter wird er diejenige Wellenlänge auswählen, mit der die beste Gewebeinteraktion ausgelöst werden kann. Da wir in unserer Mundhöhle mit den unterschiedlichsten Gewebetypen konfrontiert sind, und dies zum Teil auf engstem Raum, wie beispielsweise in der parodontalen Tasche, kann es notwendig werden, zwei voneinander verschiedene Wellenlängen in die Behandlungsplanung einzubeziehen.

Das Wissen um die Wirkungsweisen verschiedener Wellenlängen wird zunehmend von Lasergeräteherstellern aufgenommen, um nicht nur das Indikationsspektrum ihrer Geräte zu vergrößern, sondern auch bestimmte Behandlungsabläufe durch die Kombination zweier oder mehrerer unterschiedlicher Wellenlängen zu optimieren. Aus diesem Grund wird die Kombination und Anwendung unterschiedlicher Wellenlängen eines der Schwerpunktthemen des diesjährigen internationalen Jahreskongresses der Deutschen Gesellschaft für Laserzahnheilkunde e.V. (DGL) sein und sowohl in Vorträgen, Workshops als auch in der Industrieausstellung ihren Niederschlag finden.

Für die vor Ihnen liegenden Sommermonate wünsche ich Ihnen jedoch erst einmal viel Freude bei dem Genuss der unterschiedlichen Wellenlänge des Sonnenlichts.

Herzlichst Ihr

Prof. Dr. Norbert Gutknecht
Präsident der DGL



Manufacturer News

Schneider Dental

Spitzentechnik mit Komfort

Diodenlaser in der Zahnmedizin können oft mehr, als der erste Eindruck vermittelt. Dabei muss die Bedienung des Geräts intuitiv und einfach sein, trotz zahlreicher möglicher Therapien. Für kleinere Eingriffe bietet BluLase ganz aktuell den BluLase Mini an. Das handliche Gerät im Stiftformat lässt sich bequem mitführen, bietet jedoch trotz seines geringen Gewichts eine maximale Ausgangsleistung von 2,5 W im Pulsbetrieb, niedrigere Leistungen von 0,7 W und 1,7 W stehen als Dauerstrich (CW) zur Verfügung sowie 300 mW speziell für die photodynamische Therapie. Die Bedienung des BluLase Mini wird mit zwei Tasten vorgenommen, die Rückmeldung des Geräts erfolgt über eine mehrfarbige Leuchtdiode, welche den Anwender über die eingestellte Leistung informiert. Durch die Schnellwechsel-Akkus mit Tischladestation ist der BluLase Mini permanent einsatzbereit.

Neben den klassischen Diodenlaser-Indikationen ist der BluLase Mini insbesondere für die Photodynamische Thera-

pie (PDT) konzipiert. Durch umfangreiche Studien konnte ein Farbstoff auf TBO-Basis entwickelt werden, welcher bei der Laserwellenlänge von 810 nm eine hohe Effizienz bietet. Schwerpunkte der PDT sind die Endodontitis, Periimplantitis sowie Parodontitis.

BluLase vertritt die Auffassung, dass auch das beste Gerät ohne professionelle Unterweisung nicht seine ganzen Vorteile ausspielen kann. Aus diesem Grund wurde der Vertrieb sowie der Service exklusiv an die Firma Schneider Dental in Pilsach ausgliedert. Anstelle eines Postversands wird das Gerät in der Regel persönlich in die Praxis geliefert und vor Ort montiert, eine umfangreiche Einweisung von Arzt und Personal erfolgt grundsätzlich vor der Übergabe. Darüber hinaus werden im Rahmen der BluLase-Academy durch Schneider Dental in regelmäßigen Abständen Schulungen angeboten.



Schneider Dental/BluLase

Muscherstraße 8

92367 Pilsach, Deutschland

www.schneiderblulase.com

AD

**VERÖFFENTLICHEN
SIE IHR
FACHWISSEN**

Werden Sie Autor für *laser* –
international magazine of laser dentistry

Kontakt:
Georg Isbaner
Redaktionsleiter
g.isbaner@oemus-media.de

Fotona

Erbium-Laser mit patentierten Technologien

Während der IDS konnten sich Besucher am Stand von Fotona einen eigenen Eindruck vom preisgekrönten dentalen Laser LightWalker AT S machen. Internationale Experten aus dem Bereich der Laserzahnmedizin standen rund um die Uhr zur Beantwortung von Fragen zur Verfügung und demonstrierten die erweiterten Funktionen des Lasers – besonders bei schwer zu behandelnden Erkrankungen wie Periimplantitis.

Das state-of-the-art Design, die Bauweise und patentierten Technologien haben den Laser zu einem weltweit am schnellsten schneidenden Erbium-Laser gemacht. In puncto Schnelligkeit und Präzision übertrifft er damit sogar rotierende Bohrer. Gleichzeitig bietet das Gerät ein großes Spektrum effektiver Hart- und Weichgewebsbehandlungen. Typische Prozeduren mit diesem Laser sind schneller, einfacher auszuführen, weniger schmerzvoll und benötigen eine kürzere

Heilungszeit, verglichen mit konventionellen Behandlungen.

Das LightWalker AT-System enthält leistungsstarke Er:YAG- und Nd:YAG-Laser, 20W und Fotonas patentierte VSP- und QSP-Pulstechnologien für eine bestmögliche Leistung und Kontrolle während einer Vielzahl von Anwendungen, beginnend bei einfacher Kavitätenpräparation bis zur Implantologie und Endodontie. LightWalker AT ist auch der erste Erbium-Laser auf dem zahnmedizinischen Markt mit einer digital kontrollierten Handstück-Technologie (X-Runner®), der den Zahnärzten neue Behandlungsmöglichkeiten und eine bessere Präzision ermöglicht.



Fotona d.d.

Stegne 7

1000 Ljubljana, Slowenien

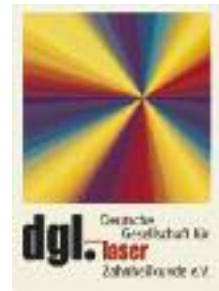
www.fotona.com

Antwort:

Deutsche Gesellschaft für Laserzahnheilkunde e.V.
c/o Universitätsklinikum Aachen
Klinik für Zahnerhaltung
Pauwelsstraße 30
52074 Aachen

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E-Mail: sekretariat@dgl-online.de
Bank: Sparkasse Aachen
IBAN: DE56 3905 0000 0042 0339 44
BIC: AACSD33

Aufnahmeantrag



Name/Titel: _____

Vorname: _____

Geb.-Datum: _____

Approbation: _____

Status: ☐ selbstständig ☐ angestellt ☐ Beamter ☐ Student ☐ ZMF/ZAH

Adresse: Praxis/Dienststelle/Institut (Unzutreffendes bitte streichen)

PLZ/Ort: _____ Straße: _____

Telefon/Fax: _____ E-Mail: _____

Privat/Ort: _____ Straße: _____

Aufgrund des bestehenden Assoziationsvertrages zwischen der DGL und der DGZMK fällt zusätzlich ein reduzierter Jahresbeitrag für die DGZMK an (85 € p.a., falls Sie noch nicht Mitglied der DGZMK sind). Der Beitragseinzug erfolgt durch die DGZMK-Geschäftsstelle, Liesegangstr. 17a, 40211 Düsseldorf. Sie werden hierfür angeschrieben.

Mit der Stellung dieses Aufnahmeantrages versichere ich, dass ich

☐ seit dem _____ in der eigenen Praxis mit einem Laser des Typs _____ arbeite. (genaue Bezeichnung)

☐ in der Praxis _____ beschäftigt bin.

☐ in der Abt. der Universität _____ beschäftigt bin.

Ich beantrage die Aufnahme in die Deutsche Gesellschaft für Laserzahnheilkunde e.V.

Ort, Datum vollständige Unterschrift

Jahresbeitrag: Für stimmberechtigte Mitglieder bei Bankeinzug 150,00 €.

Sofern keine Einzugsermächtigung gewünscht wird, wird ein Verwaltungsbeitrag von 31,00 € p.a. fällig.

EINZUGSERMÄCHTIGUNG

Ich bin einverstanden, dass der DGL-Mitgliedsbeitrag von meinem Konto abgebucht wird.

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BIC: _____ Geldinstitut: _____

Unterschrift des Kto.-Inhabers

Diese Erklärung gilt bis auf schriftlichen Widerruf

Die DGL lädt ein zur 24. Internationalen Jahrestagung



PICTURE: ©MAPICS

Der Lasermarkt kann derzeit in vielerlei Hinsicht auf eine außerordentlich positive Bilanz verweisen. Nicht zuletzt spiegelt sich dies in einem breiten Angebot an modernen und sehr effizienten Lasern wieder. Mit dem Bestreben, die Laserzahnmedizin künftig stärker in die einzelnen Fachgebiete wie Implantologie, Parodontologie oder Endodontologie zu integrieren, wird es noch besser gelingen, dem Laser den ihm gebührenden Platz innerhalb der modernen Zahnmedizin zu erkämpfen.

Der Gemeinschaftskongress, bestehend aus der 24. Internationalen Jahrestagung der DGL und LASER START UP, wird vom 27. bis zum 28. November 2015 im Hotel Palace in Berlin gemeinsam mit dem 3. Mundhygienetag, der 12. Jahrestagung der DGKZ, dem 7. Internationalen Kongress für Ästhetische Chirurgie und Kosmetische Zahnmedizin (IGÄM) und dem 4. Nose, Sinus & Implants stattfinden.

Die Programmstruktur bietet den beteiligten Firmen aktive Mitwirkungsmöglichkeiten, z. B. in Form von Workshops. Mit der Zusammenlegung verschiede-

ner Kongresse wird dem Wunsch vieler Aussteller nach Bündelung der Aktivitäten im Interesse hoher Teilnehmerzahlen entsprochen. Es werden insgesamt rund 400 Teilnehmer erwartet.

Die Kongresspräsidentschaft und Wissenschaftliche Leitung der 24. Internationalen Jahrestagung der DGL und des LASER START UPs liegt in den Händen von Prof. Dr. Norbert Gutknecht, Uniklinik Aachen.

Ziel des LASER START UP-Kongresses ist es, Zahnärzte an den Einsatz des Lasers in der Zahnmedizin heranzuführen und in diesem Zusammenhang einen Überblick über die für den Dentalbereich relevanten Laser und die entsprechenden Anbieter zu geben. Im Fokus der DGL-Jahrestagung stehen versierte Laseranwender aus dem In- und Ausland, aus der Praxis und den Universitätskliniken.

Weitere Infos gibt es unter www.dgl-online.de oder www.oemus-media.de.





27.–28. November 2015 in Berlin, Hotel Palace

[illegible]

- (1) Vortrag
- (2) Poster-Präsentation
- (3) Video-Präsentation

Computerprojektor (PowerPoint)

Bitte **bis spätestens 30. Juni 2015**

Er:YAG-Laserbestrahlung beeinflusst

Kommunikation zwischen Bakterien



Wissenschaftler des Biofilm Research Laboratories am Institut für Zahnwissenschaft und des Endodontologischen Instituts der Hebrew University-Hadassah, School of Dental Medicine in Jerusalem, Israel, haben eine bemerkenswerte Entdeckung gemacht: Die Bestrahlung mit einem Er:YAG-Laser wirkt sich nicht nur wesentlich auf die Kommunikation zwischen Zellen einer Population aus, sondern scheint auch einen Effekt auf die Kommunikation innerhalb von Bakterien zu haben, welche die Zellkommunikation sowie die Anordnung des Biofilms wesentlich stören. Für die Untersuchungen wurde der Lite-Touch Er:YAG-Laser der Firma Syneron Dental Lasers verwendet.

„Diese bisher unbekannte Interaktion zwischen Er:YAG-Laser und Bakterien eröffnet ein neues Feld in der klinischen Anwendung des Lite-Touch-Lasers“, sagte Claudia Yoel, Marketingmanagerin von Syneron Dental Lasers.

Für ihre Forschungsergebnisse wurde das Team der Hebrew University mit dem Robert Frank Award der europäischen International Association for Dental Research (IADR) ausgezeichnet. Die IADR mit Hauptsitz in Alexandria (Virginia), USA, fördert und unterstützt weltweite Forschungen in der oralen Gesundheit.

Quelle: Syneron Dental Lasers

Studie belegt:

Kaugummi könnte Ohrwurm unterbinden



90 Prozent der Bevölkerung hat mindestens ein Mal in der Woche ein Lied im Ohr – den typischen Ohrwurm. Doch 15 Prozent davon empfinden den dauerhaften Rhythmus als unangenehm und sogar störend. Eine neue Studie der University of Reading fand nun heraus, dass Kaugummi dabei helfen könnte, die ungewollten Töne loszuwerden. Denn von den insgesamt 98 Probanden dachten diejenigen, die nach dem Hören der gängigen Lieder Kaugummi kauten, weniger oft an den Song als die Gruppe, der keiner zur Verfügung stand. Darüber hinaus reduzierte der Kaugummi außerdem die Häufigkeit, mit der die Teilnehmer den Song „hörten“ um ein Drittel. Frühere Forschungen haben bereits bewiesen, dass sich allein das lautlose Singen oder das Bewegen der Kiefer auf das Kurzzeitgedächtnis sowie die Melodie in der Erinnerung auswirken. Dr. Philip Beaman, Studienleiter an der University's School of Psychology and Clinical Language Sciences, sieht im Kaugummi zusätzliches Potenzial, unerwünschte oder aufdringliche Gedanken zu reduzieren.

„Unseren „inneren Monolog“ durch einen komplexeren Ansatz des Kaugummikauens zu zerstreuen, könnte auch anderweitig eingesetzt werden.“ Um zu prüfen, ob er gegen Symptome wie Zwangsstörungen oder ähnliche Erkrankungen helfen könnte, seien aber laut Beaman weitere Forschungen nötig.

[PICTURE: ©AARON AMAT]

Umfrage belegt:

Fast jeder dritte Patient bucht Arzttermine online

Patienten schätzen die Möglichkeit, Arzttermine online zu buchen. Fast jeder dritte Internetnutzer hat dies in der Vergangenheit bereits getan (29 Prozent). 84 Prozent derjenigen, die noch keinen Arzttermin online gebucht haben, können sich dies jedoch künftig vorstellen. Dies sind die zentralen Ergebnisse einer online-repräsentativen Umfrage unter 1.000 Internetnutzern des Marktforschungsinstituts Research Now im Auftrag von jameda.



Die Möglichkeit, Arzttermine online zu buchen, wird von Männern und Frauen gleichermaßen genutzt (jeweils 29 Prozent). Unterschiede gibt es jedoch hinsichtlich des Alters. Am größten ist der Anteil derjenigen, die Arzttermine bereits im Internet gebucht haben, mit 38 bzw. 33 Prozent unter den 26- bis 35-Jährigen und den 36- bis 45-Jährigen. Am geringsten ist er unter den über 56-Jährigen. Von ihnen hat immerhin jeder Fünfte bereits online einen Termin vereinbart (19 Prozent).

Die Zufriedenheit mit der Online-Terminbuchung ist überaus groß, wie die Ergebnisse belegen. Fast alle, die bereits einen Arzttermin im Internet vereinbart haben, würden dies auch künftig wahrscheinlich oder auf jeden Fall wieder machen (98 Prozent).

Als häufigsten Grund für die Online-Terminbuchung gaben Patienten an, dass sie so auch abends oder am Wochenende einen Arzttermin vereinbaren könnten und daher nicht auf Sprechstundenzeiten angewiesen wären (60 Prozent). Zudem schätzt jeder Zweite die Möglichkeit, die Warteschleife am Telefon dadurch umgehen zu können (46 Prozent).

Medizinisch notwendige

Zahnaufhellung ist umsatzsteuerfrei

Der Bundesfinanzhof (BFH) hat in einem aktuellen Urteil bestätigt, dass Zahnaufhellungen (Bleaching), die ein Zahnarzt zur Beseitigung krankheitsbedingter Zahnverfärbungen vornimmt, umsatzsteuerfreie Heilbehandlungen sind. Im konkreten Fall hatte sich eine Plöner Zahnarztpraxis mit Unterstützung der Zahnärztekammer Schleswig-Holstein gegen den Bescheid des zuständigen Finanzamtes gewehrt. Darin waren sämtliche Bleaching-Leistungen der Praxis im Rahmen einer Umsatzsteuer-Sonderprüfung auch für zurückliegende Fälle als umsatzsteuerpflichtig eingestuft worden. Die Finanzbehörde hatte nicht unterschieden, ob es sich um rein kosmetische Aufhellungen oder die Beseitigung krankheitsbedingter Verfärbungen handelte. Da sich das Finanzamt auch von den Stellungnahmen der Zahnärztekammer wenig beeindruckt zeigte, klagte der Zahnarzt vor dem schleswig-holsteinischen Finanzgericht. Trotz dezidiert und fachlich fundierter Urteilsbegründung mochte das Finanzamt



das Urteil jedoch nicht anerkennen und ging in Revision, sodass der Fall schließlich vor den Bundesfinanzhof landete. Dieser gab dem Zahnarzt in letzter Instanz Recht.

Das Urteil: Die Zahnbehandlungen, die jeweils eine Verdunkelung des behandelten Zahnes zur Folge hatten, waren medizinisch indiziert und damit umsatzsteuerfrei. Die als Folge dieser Zahnbehandlung notwendig gewordenen Zahnaufhellungs-Behandlungen waren ästhetischer Natur, aber – im konkreten Streitfall belegt – auch medizinisch erforderlich.

Die Steuerbefreiung gilt also nicht nur für Leistungen, die unmittelbar der Diagnose, Behandlung oder Heilung einer Krankheit oder Verletzung dienen, sie umfasst auch Leistungen, die erst als (spätere) Folge solcher Behandlungen erforderlich werden, auch wenn sie ästhetischer Natur sind.

Patienten weiterhin

Zufrieden mit den Zahnärzten

Patienten vertrauen ihren Zahnärzten im Vergleich zu anderen Facharztgruppen am meisten. Dies ist eines der Ergebnisse des jameda-Patientenbarometers 1/2015, das jameda zweimal im Jahr erhebt. Die Zahnärzte erhalten von ihren Patienten auf einer Schulnotenskala von 1 bis 6 für die Kategorie „Vertrauensverhältnis“ die sehr gute Note 1 (1,46). Damit befinden sie sich in dieser Kategorie wie auch schon im Vorjahr (1,45) auf dem ersten Platz im Fachärztevergleich.

Durchschnittlich benoten die Patienten das Vertrauensverhältnis zu ihren Ärzten mit der guten Note 1,93. Großes Vertrauen bringen die Patienten neben den Zahnärzten auch ihren Urologen (1,78) und ihren Allgemein- und Hausärzten (1,92) entgegen. Das Vertrauensverhältnis zu den Augenärzten bewerten die Patienten hingegen mit einer nur befriedigenden 2,52, das zu den Hautärzten mit einer 2,55.

Die Gesamtzufriedenheit, in die auch die Kategorie „Vertrauensverhältnis“ mit einfließt, mit Deutschlands



Zahnärzten bleibt weiterhin sehr hoch. Im ersten Halbjahr 2015 erhalten die Zahnärzte eine Durchschnittsnote von 1,4 (2013: 1,4, 2014: 1,39) und liegen demnach mit Abstand auf dem ersten Platz. Wie schon in den Vorjahren folgen auf Platz 2 die Urologen (1,73) und auf Platz 3 die Allgemein- und Hausärzte (1,88). Schlusslicht bilden wie schon im letzten Jahr die Hautärzte mit 2,48.

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Stichwort: ZWP Designpreis 2014
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www.oemus.com

Printed by

Silber Druck oHG
Am Waldstrauch 1, 34266 Niestetal, Germany

laser international magazine of laser dentistry
is published in cooperation with the World
Federation for Laser Dentistry (WFLD).

WFLD Headquarters

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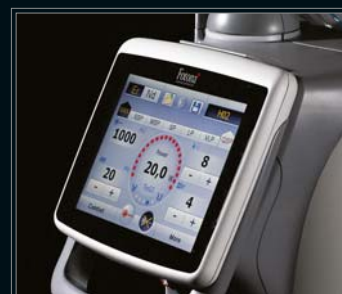


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