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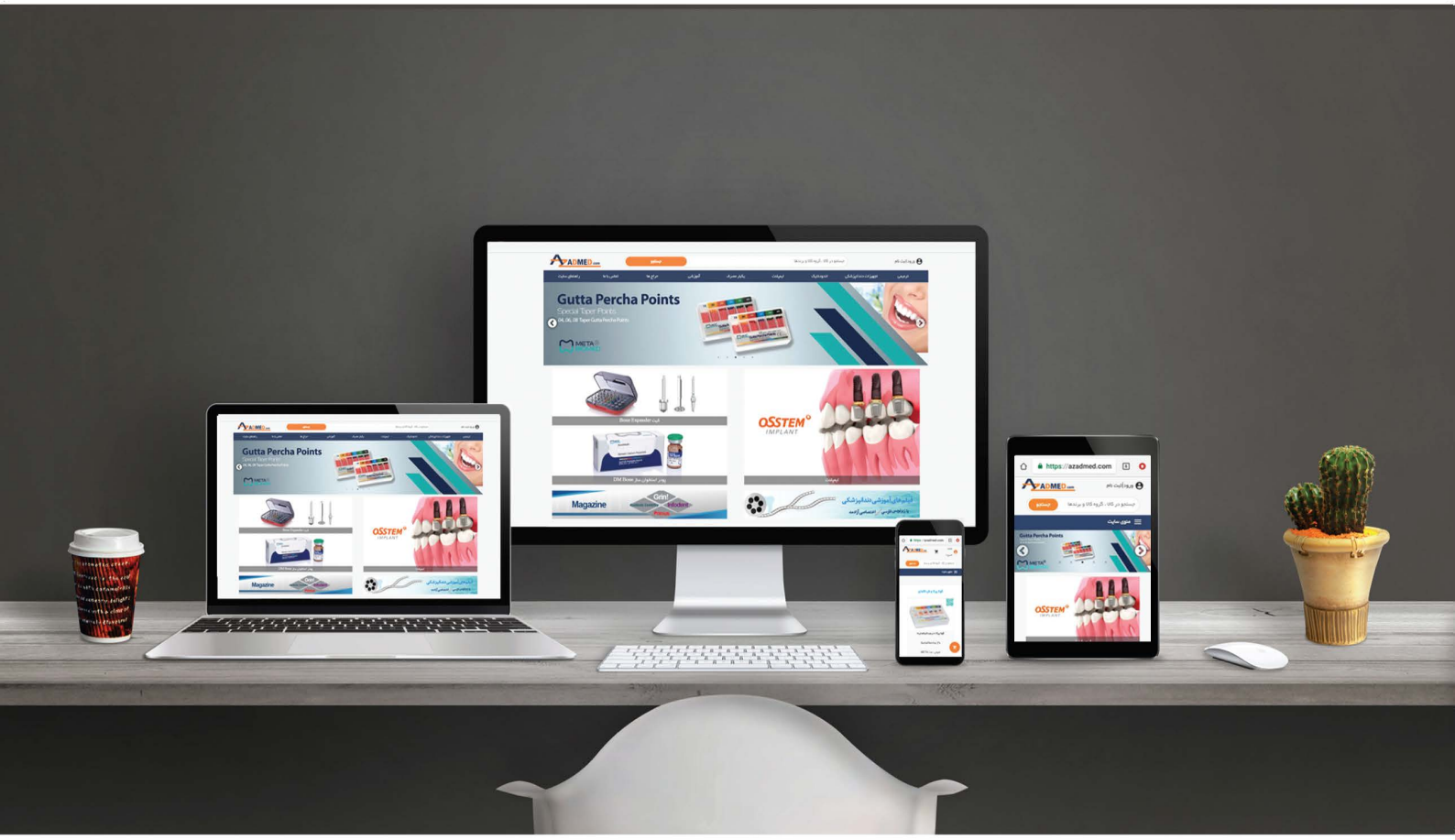

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Light to brighten the future

Kenji Yoshida

Dear readers of *laser* international magazine of laser dentistry,

We sincerely welcome all of you to Nagoya, Japan, on the occasion of the 15th Congress of the World Federation for Laser Dentistry from July 17 to 19 2016 in Nagoya, Japan.

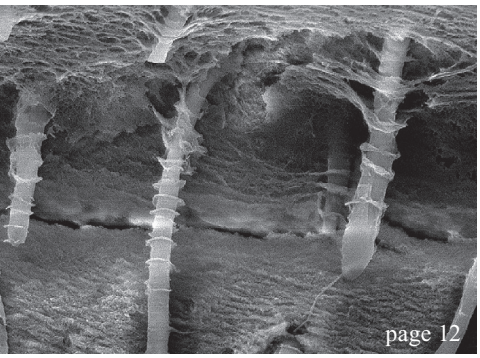
The WFLD is held every two years, and this is the third World Congress held in Japan, following the first congress in 1988 in Tokyo under the presidency of Professor Hajime Yamamoto, and the second congress in 2002 in Yokohama, hosted by Professor Isao Ishikawa.

Themed "Light to Brighten the Future", the congress aims at moving forward from existing laser dentistry and dental care as well as seeking the new developments through extensively incorporating light into diagnosis and treatment of patients. The congress features a varied programme, including lectures, a symposium, workshops, oral and poster sessions, exhibitions and seminars. Each programme will bring light to the future laser specialists in engineering and various medical fields, including dentistry. Presenters from all around the world will deliver their latest findings and scientific knowledge. It is our deepest aspiration that the congress will also be an opportunity for further advancement of academic research activities and clinical improvement, as well as herald the beginning of a new development of medical devices and expansion of the industry in Japan.

Apart from the scientific programme, opportunities for social activities, including a welcome-drink reception, Japan night and banquet during the congress. We hope the congress will be a place to acquire the latest information and knowledge and to extend your scientific networks for your future careers and research.

We are sincerely looking forward to seeing all of you at the WFLD2016 in Japan.

Kenji Yoshida
Chairperson, WFLD2016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Fluorescence-guided caries excavation of decayed teeth

An *ex vivo* study

Authors: ZA Martin Augenstein & Prof. Dr Matthias Frentzen, Germany

Introduction

The goal of caries excavation is the elimination of bacterially infected dentin to give the maximal conservation of healthy dental hard tissue as well as to maintain the vitality of the dental pulp.[1] Dentin layers near the pulp which can be remineralised—affected dentin—should be preserved in terms of an atraumatic therapy.[2,3] There are several techniques to determine the endpoint of the excavation clinically. One of these techniques is the examination of the hardness of the cavity floor using a dental probe. For this type of test, the dental probe must not infiltrate the material further; the "Crie dentaire" must be audible. However, this test is not objectifiable and does not correlate with bacterially infected dentin.[2] Additionally, Fusayama et al. observed that dentin areas close to the pulp show a significantly lower hardness than dentin of a chronical carious lesion.[2]

Fig. 1: SIROInspect® with filter glasses, accessory parts and charging station (Sirona Homepage, 2014).

Fig. 1

Studies with dye solutions, which are supposed to mark infected dentin, do not show unambiguous results either, since hypomineralised dentin areas and porosities are stained as well.[4] This often results in an overexcavation under clinical conditions, since even non-infected hypomineralised areas such as the dentino-enamel junction or healthy areas near the pulp are stained.[5,6]

A fluorescence-based optical method may be considered an alternative.[7] Optical phenomena in the tooth structure damaged by caries or the spectroscopic detection of metabolic products of a microbial infection of the dentin are used.[8,9] Examples for this procedure are the DIAGNOdent®-system,[10] intraoral camera systems with blue light excitation[11] as well as feedback controlled Er:YAG laser systems.[12] The previously-mentioned systems are difficult to implement in practice. The technology is very complex.

Devices which stimulate the dentin with a blue-light diode (405 nm) present an alternative; the examiner gives an evaluation with the help of filter glasses, making the fluorescence visible during the treatment of caries excavation. This treatment technique is called the FACE® method (Fluorescence Aided Caries Excavation).[7] The present study attempts to examine histologically under *ex vivo* conditions whether

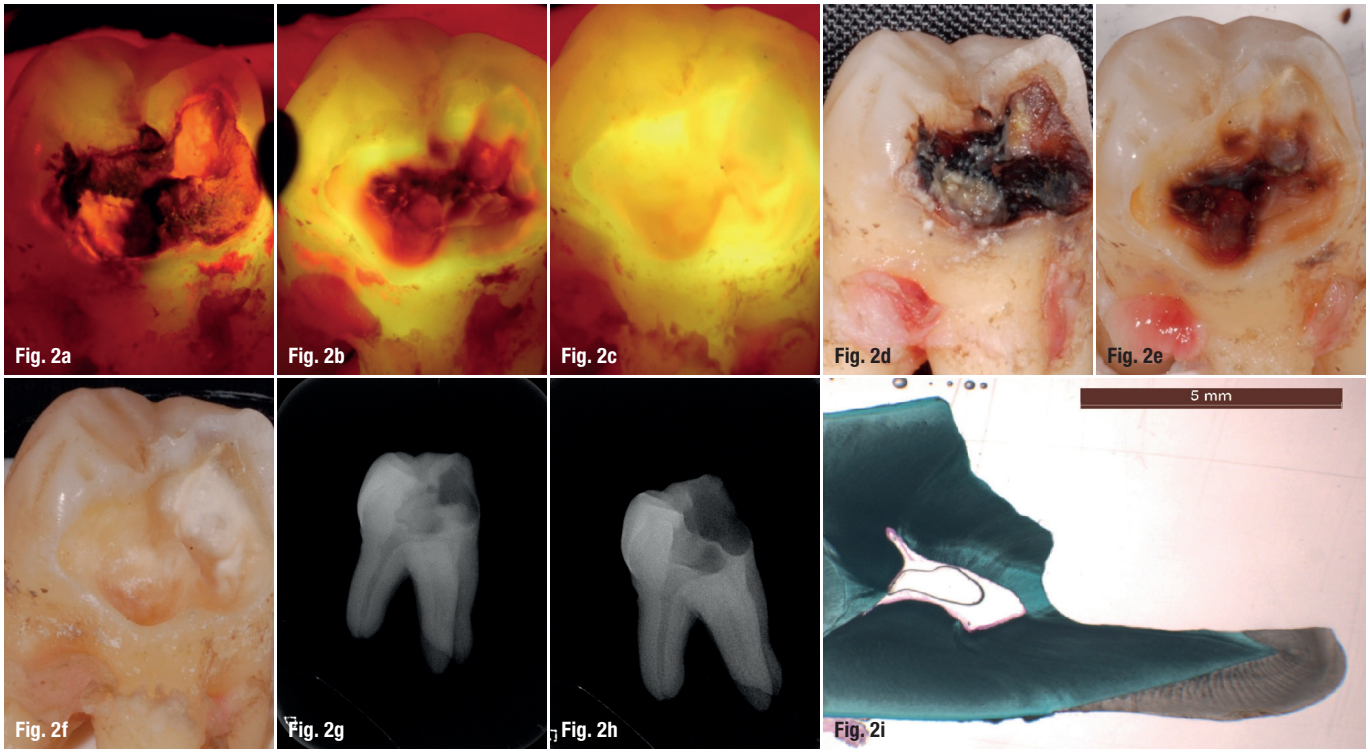

Fig. 2 a–i: Case example I—Documentation of a tooth sample in process of the examination; before excavation a daylight shot and a fluorescene shot (through a high-pass filter > 500 nm) of the cavitated decayed lesion were taken; intermediate steps **(b)**, **(e)** as well as the complete excavation **(c)**, **(f)** using the SIROInspect® were documented; additionally X-rays were taken after extraction and after the complete treatment **(g)**, **(h)**; the histological examination of the thin sections was evaluated microscopically **(i)**.

an atraumatic, complete excavation of bacterially infected dentin is possible.

Material and methods

In this study, 31 human teeth with carious lesions were examined. The indication for the extraction of the teeth was made independently from this trial. Patients gave their informed consent for the scientific use of the samples. All in all, 27 teeth were treated with the FACE®-System (SIROInspect®, Sirona, Bensheim, Germany) directly within two hours after extraction (Fig. 1); four untreated teeth served as reference for the histological evaluation.

The initial state was recorded by a photo as well as X-ray. After that, the teeth were fixed in a stage. Then the cavity was illuminated using the SIROInspect®-light probe (405 nm, 60–250 mW)

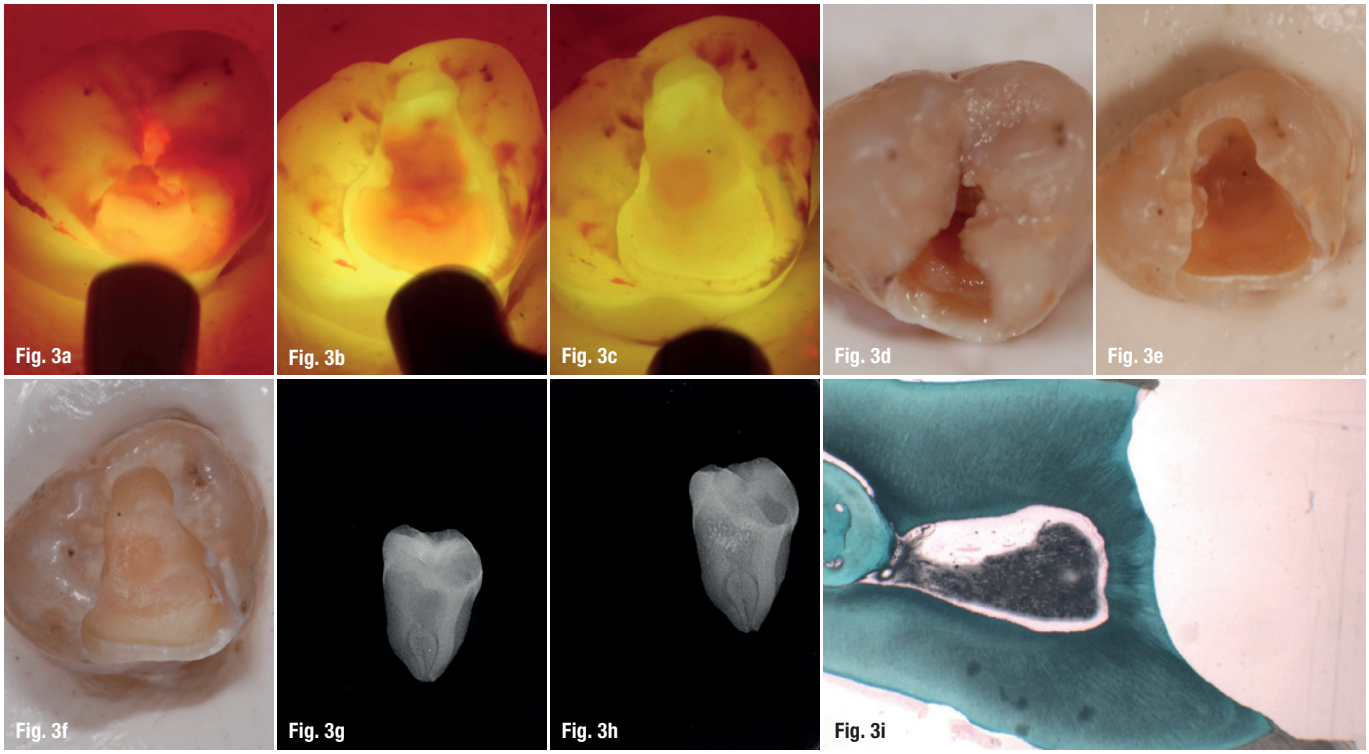

Fig. 3 a–i: Case example II— Documentation of a tooth sample in process of the examination; before excavation a daylight shot and a fluorescene shot (through a high-pass filter > 500 nm) of the cavitated decayed lesion were taken; intermediate steps **(b)**, **(e)** as well as the complete excavation **(c)**, **(f)** using the SIROInspect® were documented; additionally X-rays were taken after extraction and after the complete treatment **(g)**, **(h)**; the histological examination of the thin sections was evaluated microscopically **(i)**.

and was photographed through a high-pass filter which had the same properties as the filter glasses of the goggles (Figs. 2a, d, g and 3a, d, g). This filter system only lets waves with a wavelength larger than 500 nm pass. Subsequently, an access cavity was prepared with a diamond bur and the carious changed tissues were excavated with a carbide bur with 1,600 rpm using the laser system according to the manufacturer information until no more red fluorescent dentin was visible. The examiner used magnifying glasses to control the treatment. An X-ray and photographic documentation as well as a fluorescence image of the tooth were made according to the initial photographs (Figs. 2c, f, h and 3). The teeth were stored in isotonic saline solution during all steps of the examination. Before histological thin-section preparations were made, the teeth were stored in formalin solution (4 %) and stained with rhodamine fuchsine fast green. Overview pictures were made of all dental probes with a magnification of six times (Figs. 2i and 3i). The identification of histological caries zones (Fig. 4), until which an excavation was performed under the control of the laser system, was carried out at a magnification of 12 times and 18 times respectively. Untreated teeth with cavitated decayed lesions served as histological reference.

Results

In 93 % of the teeth with cavitated caries lesions, red fluorescence were detected in the area of the lesion. Two samples did not show red fluorescent features, but only fluoresced in the brownish spectral range. These two teeth were also excavated until there was no more brownish fluorescence. The sections of these teeth did not show any abnormalities of structure in the periphery of the carious lesions.

The X-rays revealed a complete excavation for all teeth. 96 % of the teeth were identified histologically free from bacteria (Figs. 2 and 3). In 37 % of the samples, parts of sclerotic dentin were preserved. After the excavation using the laser system, carious dentin (microbiological contamination) was identified histologically only in one sample.

Discussion

In 2002, Lennon et al. already examined whether red fluorescence corresponds to bacterially infected dental hard tissue.[7] In his study, the FACE® method was compared to other methods of excavation. DNA labeling of the samples was assessed by means of CLSM (Confocal Laser Scanning Microscopy) as objective evidence. The study showed a sensitivity of 94 % and a specificity of 83 % for the FACE® method. The results of a conventional excavation method were distinctly below those values and the excavation method using carious detector dye were rated the worst with 65 % for sensitivity and a were only 17 % for specificity.[7] Another significant finding is that if there was a

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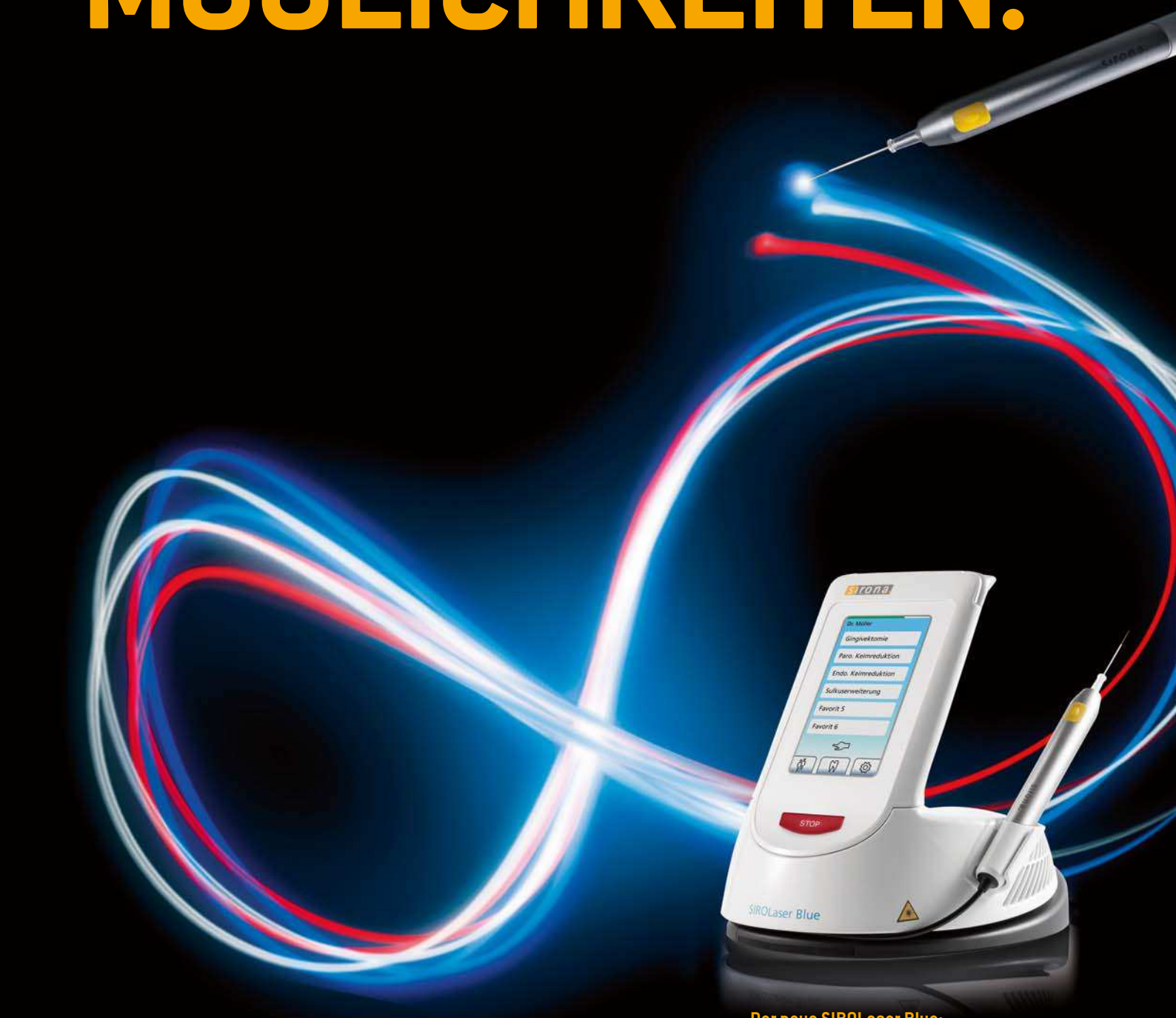

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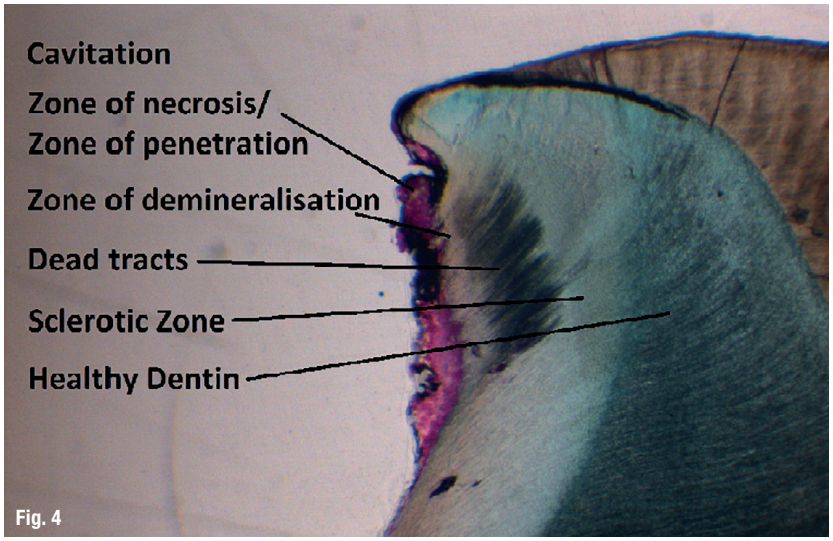

Fig. 4: 18x magnification; extended cavitation; histological image which served as reference for the determination of histological layers of caries.

lack of red fluorescence on the dental hard tissue, 95% of the tooth samples were documented clear from bacteria. This study confirms these results for the fluorescence guided carious excavation using SIROInspect®.

In addition, excavation using FACE® could be completed in a shorter period of time than the chemomechanical excavation or the use of Caries Detector®.[13] The cavity size did not increase and the number of remaining bacteria was significantly lower for the use of FACE®.[14]

In a comparative study, the FACE® method using a VistaProof camera was examined in contrast to the conventional excavation with a probe and the excavation using Caries Detector®.[15] While other treatment methods were often completed when the hard, healthy dentin was reached, in this study the FACE® method made it possible to selectively excavate bacterially infected dentin. These results coincide with the findings of the present study. After laser excavation, 96 % of the teeth were histologically caries-free and in 37 % of the samples, sclerotic dentin could be detected indicating a gentle excavation. Due to the small layer thickness of the sclerotic dentin in extended cavities, its conservation provides evidence of the method being tooth conserving.

Conclusion

The SIROInspect®-tool offers an easy, practicable system for the examiner to visualise carious hard tissue during the excavation. In addition, the easy handling of the system allows for a time-optimised excavation while minimising the risk of increasing cavity size under clinical conditions._

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Kurz & bündig

Das Ziel der Kariesexkavation ist die Eliminierung des durch Bakterien infizierten Dentins; gesundes Hartgewebe soll in größtmöglichem Umfang erhalten werden, um die Vitalität der Pulpa zu bewahren. Es gibt verschiedene Methoden, um den Endpunkt der Exkavation klinisch zu bestimmen. Dazu zählt u. a. die Untersuchung der Härte des Kavitätenbodens mithilfe einer Dentalsonde. Bei vollständiger Exkavation sollte der „Crie dentaire" deutlich hörbar sein. Alternativ wird die Möglichkeit einer Farbkodierung des Dentins beschrieben. Diese Tests sind jedoch nicht objektivierbar und zeigen nicht an, ob infiziertes Dentin vollständig entfernt wurde bzw. ob bereits eine Überexkavation im gesunden Gewebe vorliegt.

In der vorliegenden Studie wurden 31 menschliche Zähne untersucht, die kavitierte kariöse Läsionen aufwiesen. Die Indikation zur Zahnextraktion wurde unabhängig von dieser Studie gestellt; die Patienten stimmten der wissenschaftlichen Untersuchung der Zähne zu. Insgesamt 27 der 31 Zähne wurden mit Unterstützung des FACE®-System (SIROInspect®, Sirona/Bensheim) innerhalb von zwei Stunden nach der Extraktion exkaviert, vier der Zähne blieben unbehandelt und dienten als Referenzzähne für die histologische Evaluierung.

Nach Exkavation mit Unterstützung des FACE®-Systems konnten 96 Prozent der Zähne histologisch als kariesfrei eingestuft werden, bei 37 Prozent der Zähne wurde die Zone des sklerotischen Dentins im Rahmen der Kariesentfernung belassen, was auf ein schonendes Vorgehen hindeutet.

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Evaluation of a self-adhesive composite in dentin surfaces

Preparation with Er,Cr:YSGG laser

Authors: Dr Ana Catarina Nogueira da Silva, Prof. Paulo Ribeiro Melo, Prof. Sofia Arantes Oliveira & Prof. Norbert Gutknecht, Portugal, Germany

Introduction

Flowable resin composites appeared in the late 1990s, and they have properties like low modulus of elasticity and high wettability, which are very desirable for the clinical work.[1,2] The development of dentistry has eventually led to minimal invasive dentistry, with smaller preparations, giving the flowable resin composite an important role due to its flow characteristics and easy application.[3]

Self-adhesive flowable resin composites combine a bonding system and a flowable composite. This kind of material is an adequate tool to use in more difficult patients and children, because it allows a restorative procedure with less steps and less time in the dentist chair. The self-adhesive flowable resin composite used in this study was the Vertise™ Flow (VF) from Kerr, was released in the market in 1992, and has the OptiBond™ bonding mechanism to dentine.[4] This material has the characteristics described in the Table 1.

The GPDM (phosphate functional group) forms a chemical bond with the calcium ions on the tooth, and the prepolymerized filler present in the VF minimises the shrinkage and enhance properties of clinical handling. The VF does a micromechanical adhesion with the formation of a hybrid layer, which consists in resin impregnation with collagen fibres and dentin smear layer.[4]

Dentin is a mineralised subtract of the tooth which has an intricate three-dimensional frame, with tubules extending from the pulp to the dentino-enamel junction, intratubular and peritubular dentin. It has 70 % (by weight) of mineral, 20 % of organic component and 10 % of fluid. The composition of the organic matrix is 90 % of fibrillar type I collagen and 10 % of noncollagenous proteins like phosphoproteins and proteoglycans. Because of this complex structure, only a few structure-property relationships can be performed.[5,6]

Actually, the formation of a hybrid layer, with the monomers impregnation into the dentin partially demineralised, and its subsequent polymerisation seems to be the most successful method.[7,8] Erbium lasers cavity preparation results in the absence of smear layer, opened dentinal tubules and micro irregularities on the dentin in result of the removal of the intertubular dentin, outcoming in a dentin surface more suitable to adhesive procedures. The effect of laser on the collagen network is still not completely

Table 1: Self-adhesive flowable resin composite used in this study.

Self-adhesive flowable resin composite

ID	Material	Manufacturer	Compositions
VF	Vertise™ Flow	Kerr	GPDM, HEMA, prepolymerized filler, 1-µm barium glass filler, nanosized colloidal silica, nanosized Ytterbium fluoride

clear, but it is known that laser irradiation can develop microstructural alterations and micro rupture of collagen fibres.[9] The reported bond strengths of composite resin to dentine substrate prepared by erbium lasers have often been confusing and contradictory.[10]

The Er,Cr:YSGG laser has a wavelength of 2.79 µm. The ablation threshold in human dentin is 2.69 to 3.66 J/cm^2.[11] The laser frequency is the number of laser pulses per second.[12] Theoretically, an increase of the laser frequency would result in a smoother surface, which could reduce the gaps between the composite and the dental surface.

The main objective of this study was to evaluate the bond strength of self-adhesive flowable composite Vertise™ Flow in dentin surfaces prepared with Er,Cr:YSGG laser with two different settings.

The null hypotheses to test were: (a) the micro-shear bond strength of the restorations with Vertise™ Flow self-adhesive flowable composite is the same, in dentin surfaces prepared with bur and Er,Cr:YSGG laser; (b) micro-shear bond strength of the restorations with Vertise™ Flow self-adhesive flowable composite is the same, in dentin surfaces prepared with Er,Cr:YSGG laser with the settings 4.5 W, 50 Hz, 50 µs, 70 % air, 90 % water and with the settings 4.5 W, 75 Hz, 50 µs, 70 % air, 90 % water.

Materials and methods

The sample consisted of 15 non carious molars extracted by periodontal or orthodontic reasons. After extraction, the teeth were cleaned and stored in 0.5 % chloramine T at a temperature of about 4 °C to carry out the disinfection and preventing bacterial growth for no longer than three months until used in the experiment. Afterwards, the teeth were numbered by a person assigned, and distributed to the three groups (n=5) by another person assigned.

To obtain the samples for the electron microscopy, two from each group, the coronal occlusal third of the teeth and the roots were removed by bisecting the tooth transversely with a low speed diamond saw and copious supply of water. It resulted in approximately 2 mm thick dentin discs.

To obtain the samples to the Tensile Bond Strength (TBS) test, three teeth from each group were longitudinally sectioned into two parts where the proximal enamel was removed by a disk to expose the dentin.

Groups

The laser samples were submitted to an Er,Cr:YSGG laser (Waterlase iPlus—Biolase Technology Inc., Irvine, CA, USA), with two different settings , with the MZ8 tip, using the beam with an angle of 45° to the surface, with smooth movements in the horizontal and vertical, during twelve seconds in the dentin discs, and eight seconds in the teeth's proximal surface, where the area was smaller than the discs. The dentin samples from the control group were not submitted to any laser treatment:

Group 1: Control Group (n=10) Material: Vertise™ Flow (Kerr, Orange, CA, USA) (without laser surface treatment).

Group 2: Settings 4.5 W, 50 Hz, 50 µs, 70 % air, 90 % water (n=10) (Fig. 7) Material: Vertise™ Flow (Kerr, Orange, CA, USA).

Group 3: Settings 4.5 W, 75 Hz, 50 µs, 70 % air, 90 % water (n=10) (Fig. 8) Material: Vertise™ Flow (Kerr, Orange, CA, USA).

The Vertise™ Flow self-adhesive flowable composite was applied in the dentin surface from each sample, about 3 mm delimited by a tape of polyester (Mylar) and a silicone mold with 3 mm of diameter and 4 mm of high to the samples to the SBS test, directly to dentin in the discs used in the SEM, and lighted cured for 20 seconds with a LED curing light Bluephase C8 (Ivoclar Vivadent) 800 mW/cm^2.

Subsequently, the samples were placed in an incubator at 37 °C with 100 % humidity for 24 hours. Next, they were thermocycled 500 times in baths of 5 °C and 55 °C for 20 seconds at each temperature, to simulate the *in vivo* conditions in the oral cavity. At the end of thermocycling, the samples returned to the incubator for more than 24 hours.

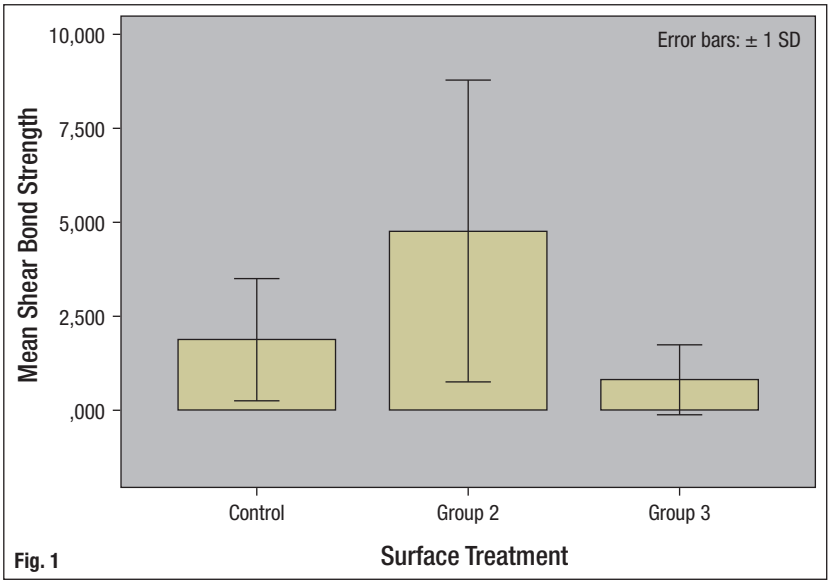


Fig. 1: Mean and standard deviation of the Shear Bond Strength (MPa) in the three groups.

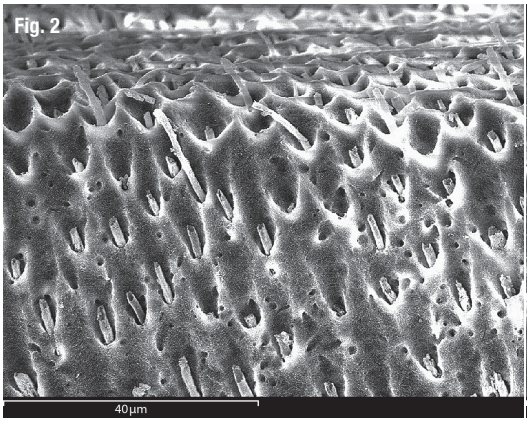


Fig. 2: SEM of the dentin surface without laser preparation (Control), showing the micromorphological aspects of the bonding region produced by Vertise Flow™. Note the regular surface and the wide dentinal tubules with resin tags (x1,500).

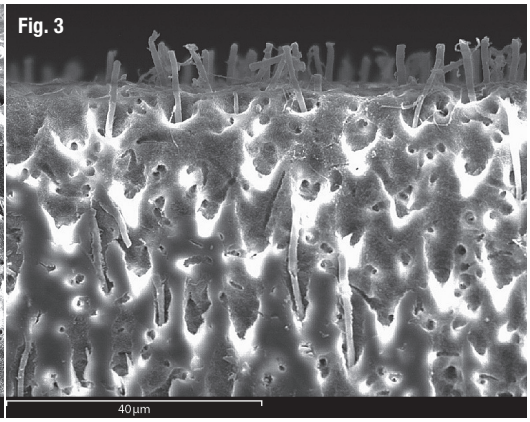


Fig. 3: SEM of the dentin surface without laser preparation (Control), showing the micromorphological aspects of the bonding region produced by Vertise Flow™. Note the sectioned resin tags in the dentin surface (x1,500).

Preparation of samples for scanning electron microscopy

The samples discs were split in half (MD) with a diamond blade mounted on the handpiece resulting in restored hemi-discs. The hemi-discs were prepared to be observed on the SEM. The observations were made using the electron microscope scanning—FE SEM (JEOL JSM 6301F) at 10–15 kV and were focussed in the area resin-dentin interdiffusion. The electron microscopy photomicrographs were taken in a variation of 300 x and 5,000 x magnifications.

Shear Bond Strength (SBS) test

The Shear Bond Strength was performed using the Instron device connected to a computer, (system developed at the University of California, San Francisco). Shear Bond Strength was tested at 1 mm/min.

Statistical analysis

The Shear Bond Strength values were analysed using the Shapiro-Wilk test to control the normality assumptions, because the number of the sample was lower than thirty. The homogeneity assumptions were controlled by the Levene test. Although the data were normally distributed, the Levene test rejected the homogeneity of the variances. Therefore, the Welch test was applied and the Games-Howell post-hoc test was used to compare pairwise, with a confidence interval of 95%.

Results

Shear Bond Strength test (SBS test)

All statistical analyses were performed using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA). Group 2 was the one with the highest Shear Bond Strength mean (4.76 ± 3.99 MPa), although the standard deviation is the highest, and the Group 3 had the lowest Shear Bond Strength mean (0.81 ± 0.93 MPa), as we can see in the graph (Fig. 1). This means of the Shear Bond Strength of the Control Group (1.87 ± 1.61 MPa), of Group 2 (4.76 ± 3.99 MPa) and of the Group 3 (0.81 ± 0.93 MPa), were not statistically different between each other ($p > 0.05$).

Scanning electron microscopy

Control Group

In these dentin samples we saw a regular surface, with resin tags in the surface of the dentin going through the open dentinal tubules. The resin tags appeared to be sectioned, showing an adhesive failure (Figs. 2 and 3).

Group 2

In the analysis of the samples of Group 2, a rougher dentin surface was noted, with several resin tags. It was possible to see a hybrid layer for-

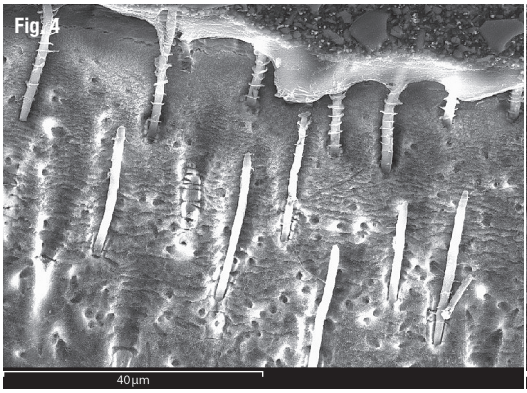


Fig. 4: SEM of the dentin surface pre-treated with Er,Cr:YSGG laser from Group 2, showing long resin tags with lateral branches (x1,500).

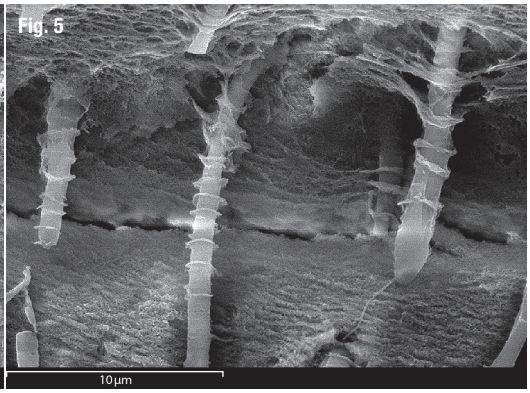
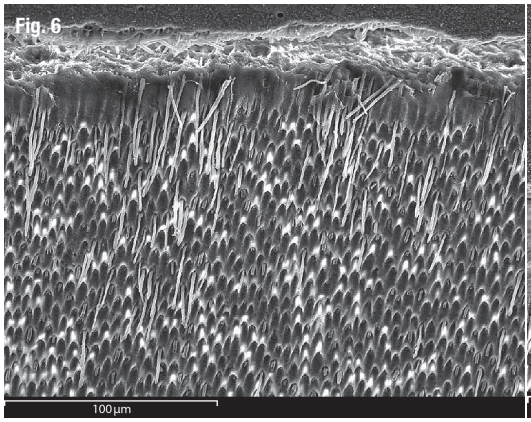


Fig. 5: SEM of the dentin surface pre-treated with Er,Cr:YSGG laser from Group 2, showing long resin tags with lateral branches. The formation of a gap along the interface was observed (x5,000).



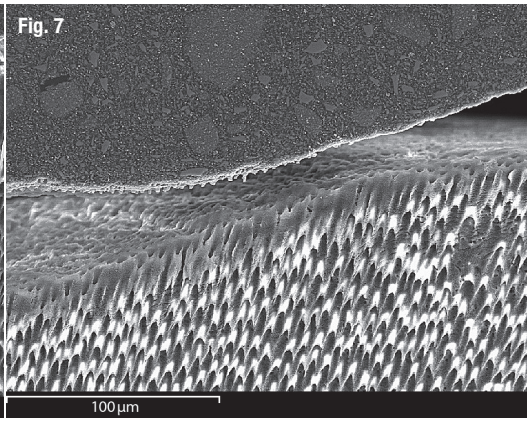


Fig. 6: SEM of the dentin surface pre-treated with Er,Cr:YSGG laser from Group 3, showing the micromorphological aspects of the bonding region produced by Vertise™ Flow. The formation of a gap along the interface was observed (x500).

Fig. 7: SEM of the dentin surface pre-treated with Er,Cr:YSGG laser from Group 3, showing the formation of a gap along the interface (x500).

mation in all the samples and the presence of resin tags with lateral branches. A gap along the interface between the VF and the dentin surface was seen in two of the samples (Figs. 4 and 5).

Group 3

In the dentin surface of the samples of Group 3, it was possible to observe what seems to be melted dentin, with a few open dentinal tubules, and a gap along the interface (Fig. 6). In a sample, it was not possible to observe resin tags in the dentinal tubules, there was almost no hybrid layer and a big gap along the interface between the VF and the dentin surface was observed (Fig. 7). The samples of this group seemed to have a smoother dentin surface than those in Group 2, but rougher than the samples of the Control Group (Figs. 6 and 7).

Discussion

There are already several studies about adhesion in dental surfaces prepared with laser, but mostly with Er:YAG and enamel, and fewer about self-adhesive flowable in dentin, especially with Er,Cr:YSGG laser. Several factors can influence the adhesion to dentin, such as the dentin substrate itself, the treatment and the dentin conditioning.[13,14] The adhesion to dentin was always a greater challenge because of the water and collagen content.[15] The dentin hybridisation is the accepted mechanism to explain the resin-dentin bond, which consists in demineralised dentin with infiltrated monomers and its polymerization.[8]

Several articles showed that dentin surfaces prepared with Er,Cr:YSGG laser appear with open dentinal tubules looking cuff-like, irregular and rough, and are without smear layer.[9] These features of lased dentin theoretically should have better conditions for adhesion.[15] The comparison presented by Beer et al., between dentin surface prepared with Er,Cr:YSGG laser and self-etch system and a dentin surface also prepared with Er,Cr:YSGG laser and etched with 37% phosphoric acid, showed better SBS with the first system.[16] The application of acid in the dental surface prepared with laser dissolves the intertubular dentin, altering the surface produced by laser, and leading to unknown dentin-demineralised depths, which could interfere with the monomers diffusion.[17–19]

Therefore, theoretically we do not need acid etching prior the adhesive to accomplish an adequate adhesion in lased surfaces. Despite the advantages of the dentin surfaces prepared with Er,Cr:YSGG in adhesion,[15] several studies have demonstrated a lower SBS when compared with surfaces treated with conventional methods.[9,15,20,21] However, this subject is still treated controversially.[22,23]

Group 2 presented higher mean values of bond strength (4.76 ± 3.99 MPa), followed by the Control Group (1.87 ± 1.61 MPa). A lower adhesion result was observed in Group 3 (0.81 ± 0.93 MPa). The high standard deviation presenting in Group 2 shows that probably there was more variability in the sample than expected. The age of the dentin samples could be a factor with an impact on the Shear Bond Strength,[24] that was not controlled in this study, and also the sample probably should be higher. None of the SBS differences between the three groups were statistically significant ($p > 0.05$), so neither of the null hypothesises were rejected.

The settings used in Group 2 resulted in a surface without smear layer, which was rougher than the Control Group. The absence of smear layer and open dentinal tubules promotes a better surface for adhesion, leading to a better infiltration of the resin tags, which were observed in the SEM micrographs of this study.[25] A study performed by Yazici et al., comparing the Shear Bond Strength of the VF in human dentin lased with Er:YAG and unlased surfaces, also showed better results in the lased ones.[3]

Moreover, the manufacturer of VF claims that the acidic phosphate group etches the dental sur-

face, creating a chemical bond with the calcium, probably enhancing the adhesion. According to Visuri et al., the main presence of peritubular dentin in the dentin surface treated with laser can explain why the SBS was better than that of the Control Group.[26] This surface results from a higher content of water in the intertubular dentin, leading to more ablation of this substract.[9] The mean of the SBS of the VF in Group 2 (4.76 ± 3.99 MPa) was lower compared to other studies performed by Altunsoy et al., and Yazici et al. in lased dentin with Er:YAG.[1,3]

One of the main reasons that could explain this difference is the use Er:YAG laser in these studies, and the different settings applied.[1,3] In all samples of Group 3, and in one of Group 2, a gap in the interface of the dentin surface and the VF was seen, probably due to thermocycling. According to El-Marhomy et al., the thermocycling influences the marginal gap of composite restorations,[27] because the hot water can accelerate the hydrolysis of the interface components and induce stress between the composite and the dental surface.[28] Despite these findings, the effect of thermocycling is still controversial because some studies showed no influence of thermocycling on gap formation.[29]

One of the objectives of this study was to compare the influence of the laser frequency on the SBS of the VF. The results showed that even if you get a smoother surface with the increasing of the laser frequency, as we can see in the SEM micrographs, the SBS is lower (0.81 ± 0.93 MPa) compared to Group 2 (4.76 ± 3.99 MPa) and Control Group (1.87 ± 1.61 MPa). These results concur with a study performed by Samad-Zadeh et al., in which the authors concluded that the SBS was higher in the laser-textured dentin substrate, with greater spacing patterns.[30]

Comparing the results of this study with other studies is always a challenge because different lasers and parameters influence the laser-tissue interaction, leading to different outcomes. All dental products on the market were produced to work in dental surfaces prepared by conventional methods like the bur. This study and all the studies referred to in this article tested those materials available in the market. The results should be used to develop new products, with a laser-treated dental surface in mind.

Conclusion

Although the bond strength of the Vertise™ Flow was influenced by the type of dentin surface and the laser parameters, the results of each group were not statistically different between each other ($p > 0.05$), showing no significant difference concerning dentin-surface treatment. The increase of only the laser frequency resulted in lower SBS. Additional studies should be carried out in order to reach a better adhesion of self-etch flowable composites in dentin surfaces prepared with Er,Cr:YSGG laser, possibly trying new laser settings._

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

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Kurz & bündig

Selbstklebende, fließfähige Harz-Composites verbinden ein Bondingsystem mit einem fließfähigen Composite. Diese Art Material ist ideal für den Einsatz bei schwierigen Patienten sowie Kindern, da es eine Restauration in wenigen Schritten mit einer kürzeren Behandlungsdauer begünstigt. In der vorliegenden Studie wurde das selbstklebende, fließfähige Harz-Composite Vertise™ Flow (VF) der Firma Kerr verwendet.

Das Hauptziel dieser Studie war es, die Bondingstärke des selbstklebenden, fließfähigen Composites Vertise™ Flow an Dentinoberflächen zu ermitteln, welche mithilfe eines Er,Cr:YSGG-Lasers in zwei verschiedenen Voreinstellungen präpariert wurden. Obwohl die Bondingstärke des verwendeten Composites durch die Dentinoberfläche und die Laserparameter beeinflusst wurde, unterschieden sich die Ergebnisse der verschiedenen Versuchsgruppen statistisch nicht voneinander ($p > 0.05$), sodass kein signifikanter Unterschied hinsichtlich der Behandlung der Dentinoberfläche festgestellt werden konnte. Ein Erhöhen der Laserfrequenz bewirkte eine niedrigere SBS (Shear Bonding Strength). Weitere Studien sollten durchgeführt werden, um eine verbesserte Adhäsion der selbstätzenden, fließfähigen Composites an Dentinoberflächen zu erreichen, welche durch Er,Cr:YSGG-Laser präpariert wurden. Dabei könnten weitere Laser-Einstellungen getestet werden.

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Smear layer removal with laser in drilled implant holes

A pilot study

Author: Dr Alireza Mirzaee, Iran

Introduction

Dental implants form a new opportunity window for individuals who have lost their teeth due to various reasons such as trauma, dental caries and periodontal diseases.[1,2] According to published papers, less than 8 % of dental implantation surgeries have failed.[3,4] Formation of smear layer after usage of dentistry tools or by bacterial flora surrounding the implant cavity may, however, result in implant fracture.[5–7]

Smear layer refers to a remainder of bone tissue after usage of dentistry tools which may challenge the success of relief, joints and penetration of materials to bottom layers such as the root canal. This layer includes different materials like bone and soft tissue lesions, blood cells and microorganisms. These lesions are not limited to inter-dental or bone septum, but may penetrate to bone tubules and do not solve related negative effects.[5,8] Formation of this layer defects the sealing process and creates an environment for growth of microorganisms and bacteria to bone tissue which may decrease the probability of deep cleansing and result in fracture of the implant.[5] Therefore, it is highly required to discover safe and inexpensive methods to remove this layer.

Laser is abbreviated from "Light Amplification by Stimulated Emission of Radiation" and is effectively used in dentistry interventions.[9] Various types of lasers have different impacts on bacteria, depending on type of radiation, conditions of radiation and bacterial density. Vercruyssen et al. conducted a study in which they applied pulsed Nd:YAG laser radiation on teeth root in *in-vitro* environment. The results indicated that density of *E. coli* and *Staphylococcus aureus* was significantly reduced and when the application of sodium hypochlorite was added to the treatment, the bactericidal effect was increased.[10] Meral et al. reported that Nd:YAG laser radiation exhibits various levels of lethality rates for different bacteria. As their results shown, the lethality rate for *Staphylococcus alpha* hemolytic was higher compared to *Staphylococcus nicira*.[11] In another study conducted by Lee et al. with diode laser applied on *Staphylococcus mutans* colonies with a thickness of 500 microns, a lethality rate of 97.7 % was observed. With increase in thickness of the bacteria colony, the lethality rate was reduced.[12]

Many types and categories of laser instruments are being introduced to the worlds of dentistry and medicine, but their application and effectiveness are yet to be evaluated and studied. Among these instrument, Er,Cr:YSGG laser is widely used for bone incisions and soft tissues surgeries in dentistry.[13] Compared to conventional mechanical drills, this particular type of laser exhibits minimised tissue damage and does not increase the tissue temperature to intolerable ranges.[14] The bactericidal effects of Er,Cr:YSGG laser is another important aspect of this type of laser. Schoop et al. observed in their research that Er,Cr:YSGG laser managed to remove the layer of bacteria from smear layer on the root.[15] Miller et al. stated that this type of laser has an appropriate impact in disinfecting the dental implant surface.[16] Since this type of laser has been accepted as a conventional disinfecting instrument,

operations for removing the smear layer show better results.[17]

As our researches indicated, none of the studies carried out an evaluation of the effects of radiation conditions of Er,Cr:YSGG laser on removing the smear layer of the bone cavity for dental implants that report optimum radiation conditions. Hence, the objective of the current study is to evaluate various conditions of radiation of this particular laser for the removal of smear layer from bone cavity in *in-vitro* conditions.

Materials and methods

This is a semi-experimental *in-vitro* study performed on bone cavities drilled on the femur of a bovine calf.

Bone preparation

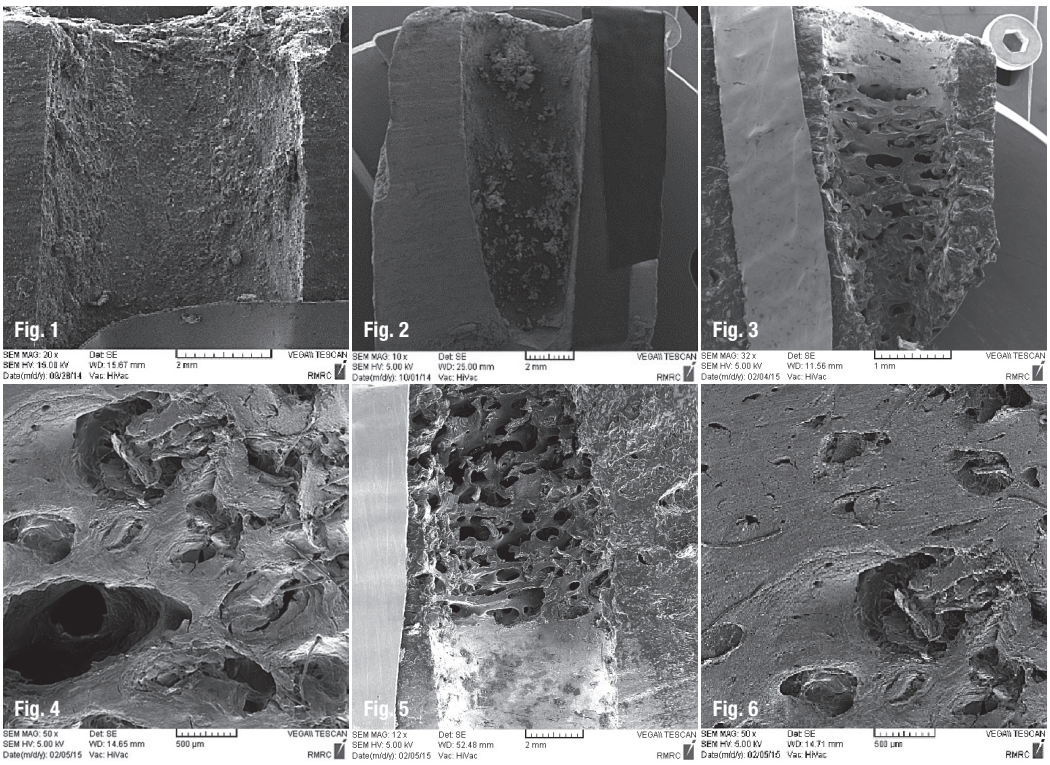
Initially, the femur bone of recently a slaughtered bovine calf was removed and kept in water of a temperature of 4 °C. Prior to the commencement of the tests, the bone surface was placed in ambient temperature for twelve hours to be completely dried and then all residues were removed from the bone surface using sand paper, then washed by tab water and again placed in ambient temperature for the next twelve hours. In the next stage, 102 holes were drilled with a depth of 15 mm on the femur bone on the basis of NEOSS system implant protocol for Pro Active Tapered implants with a diameter of 4.5 Ø, using Pilot Drill 2.2 Ø and a speed of 1,000 to 1,200 rpm.[18] The space between the holes is 2 centimeters. Then the holes were categorised in 17 six-member groups which include 16 direct radiation groups and one control group. Then the holes were washed with water and placed in ambient temperature for twelve hours to be used in the laser intervention.

Laser instrument

In this study we applied a radiation of an Er,Cr:YSGG laser instrument configured with 16 settings (Figs. 1–6) on the bone cavity. The exposure conditions include power configuration rage

Table 1: Number of drilled cavities with smear layer in 16 studied groups.

No.	Power (W)	Frequency (Hz)	Mode (H/S)	Air (%)	Water (%)	Tip	Time (S)
1	4.5	50	H	10	80	RFTP5	60
2	4.5	50	H	10	80	RFTP5	120
3	4.5	40	H	10	80	RFTP5	60
4	4.5	40	H	10	80	RFTP5	120
5	4.5	30	H	10	80	RFTP5	60
6	4.5	40	H	10	80	RFTP5	180
7	3	15	H	10	90	RFTP5	20
8	3	15	H	10	90	RFTP5	40
9	1.5	30	H	10	90	RFTP5	20
10	1.5	30	H	10	90	RFTP5	40
11	1.5	30	H	10	70	RFTP5	60
12	1.5	30	H	10	70	RFTP5	120
13	1.25	50	H	10	50	RFT2	60
14	1.25	50	H	10	50	RFT2	120
15	0.75	20	H	10	50	RFT2	60
16	0.75	20	H	10	50	RFT2	120



Figs. 1–6: SEM images of settings 13 to 16 and control group before intervention.

of 0.75 to 4.5 Watts with frequencies of 20 to 50 Hertz, an air percentage of 10 % and water cooling percentage of 50 to 90 with a radiation time ranged from 20 to 180 seconds. Before radiation on each cavity, the other cavities were covered with aluminum paper. Radiation was commenced by locating the laser fibre in each cavity. Time was also measured by watch on the basis of different settings. Laser radiation was accompanied with water spray as abolisher. Samples of the control group were also rinsed with tab water using a 10 cc syringe after drilling the related cavities.

SEM imaging

For provision of the SEM images, initially all cavities were cut in half and prepared according to the study conducted by Freitas et al.[18] In summary, after cutting the cavities, samples were submersed in 2.5 % glutaraldehyde solution in combination with 0.1 molar sodium cacodylate buffer solution with acidity degree of 7.4 for 12 hours and at a temperature of 4 °C. Then all samples were dehydrated using 25 % to 100 % ethanol solution; hexamethyldilslazane solution was used for 10 minutes for drying the samples. Paper filters were used at the time of airbrushing the samples; then samples were mounted in aluminum tubes using a silver-gold colloid adhesive. Cavities were imaged using SEM before and after exposure to radiation to evaluate the condition of smear layer qualitatively.

Statistical analysis

The data were qualified according to presence/absence of smear layer which were analysed using Mann-Whitney U-Test and SPSS 17 software.

Findings

The SEM images captured from cavities exposed to 16 settings of Er,Cr:YSGG laser are presented in Figs. 1–6. The images are captured from four settings after 100 % removal of smear layer.[1] Images are demonstrated on the basis of different settings. Series (a) of images are taken prior to application of radiation and series (b) show the results of application. Among the mentioned 16 settings, only the numbers 13 to 16 (Figs. 1–6) revealed an appropriate removal of smear layer. SEM images of settings 13 to 16 and control group are illustrated here.

Discussion

The main objective of this study is to evaluate the bactericidal effect of various settings of Er,Cr:YSGG laser radiation. According to the findings of the research, from a total of 16 settings, 1.5 and 3 Watt radiation condition, frequencies of 15 and 30 Hz and time of 20 and 40 seconds, a smear layer removal efficiency of up to 100 % was achieved in comparison to the control group.

Er,Cr:YSGG laser is a safe instrument with a high level of tissue adaptive capability; compared to conventional drills used for preparation of the bone bed of the implant, application of this instrument results in a much smaller temperature raise in the tissue, which is within the tolerance range of the tissue.[19] It seems that the application of this particular type of laser imposes mitochondrial osteoblastic function with no significant impact;[20] in other words, the osteoblastic function necessary for bone formation around the implant area is preserved using this method. Additionally, according to the findings of Secilmis et al., using power configurations of 1 and 2 Watts imposes minerals of hard tissue with not significantly change and superficial strength, connectivity capability is not reduced.[21] Additionally, histo-pathological evaluations indicate that various radiations of this laser with lesser powers do not trigger inflammatory response; the application of laser radiation does not elevate inflammatory response to ranges that affect the tissue healing process with negative effects.[22] Few studies are conducted on disinfection capabilities of Er,Cr:YSGG laser. Ishizaka et al. found that lower power used in Er,Cr:YSGG laser radiation preserved the smear layer removal performance. In their study, all three power configurations of 1, 3 and 5 Watts removed the smear layer properly; also, the performance was related to the diameter of the tip of the fibre and flatter tips proved to be more efficient in disinfection.[23] Yamakazi et al. did not find significant differences in the smear layer removal performance using power configurations of 1 to 6 Watts; however, in contrast to dry radiation, cooling the target at the time of radiation resulted in better performance of smear layer removal.[24]

Microorganisms are an important part of the smear layer that may have a specific role in reducing the success rate of dental implants. Several studies were focussed on the bactericidal effects of the Er,Cr:YSGG laser radiation. Generally, these studies did not focus on different settings of laser radiation, bur investigated tooth root canal and implant surface. Moreover, specific germs that participate in implant infection are similar to oral microbial flora and pathogens.[24,26] Gordon et al. studied 15 settings of Er,Cr:YSGG laser (175 to 325 mW and exposure times of 15 to 340 seconds) and their results were compared to the results of

application of 2.5 % hypochlorite solution for the removal of *Enterococcus faecalis* colonies from root canals. Their findings showed that the disinfection capability of the laser radiation is increased through the elevation of power and exposure time; as for their study, the best result was achieved by a power of 325 mW with an application time of 120 seconds without using water cooling. This setting managed to achieve a 99.7 % success in disinfection; disinfection processes using water showed better results compared to dry disinfection.[64]

Arnabat et al. evaluated the effects of laser radiation with power configurations of 1 and 2 Watts for application times of 30 and 60 seconds; they reported similar results in relation with power and time of the application in the removal of *Enterococcus faecalis*. In their study, 5 % sodium hypochlorite solution treatment had the best disinfection performance and 2 Watts for 60 seconds, and 1 Watt for 120 seconds respectively showed second and third best disinfection performances.[27] Various conventional chemical treatments are used as mouthwashes, dryer or disinfectants that sometimes are used as bactericides for the implant cavity. The most common agents are EDTA, Chlorhexidine and sodium hypochlorite. Difference in disinfection capability, restriction to some particular bacteria and cytotoxicity are among the limitations of such chemicals.[17,28,29] However, application of laser radiation can be considered as an alternative means for the removal of bacteria or a supplementary method used with chemical disinfectant agents.

Conclusion

In this study, findings were interpreted qualitatively to introduce best radiation condition. Despite the potential relation between application power and time to effectiveness, the removal of smear layer by laser showed no regular pattern. In our study, power configurations ranged from 0.75 to 4.5 Watts with various application times were studies featuring an application of 1.5 and 3 Watts of power achieved better results.

However, research was subject to some limitations; in the study we did not evaluate bacterial or fungus germs that contaminated the cavities. Other negative aspects of the study were *in-vitro* environment and lack of comparison of effects of laser application and effects of mentioned chemical treatment. Addressing such defects in future studies can result in more comprehensive results.

In the end, our findings indicated that the application of Er,Cr:YSGG laser with power configurations of 1.5 and 3 Watts accompanied by air brushing and water cooling, with application times of 20 and 40 seconds, result in the most effective removal of smear layer. These conditions lead to better results in comparison with higher powers and exposure times; as the exposure time is reduced, the probability of tissue damage diminishes._

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

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Kurz & bündig

Im vorliegenden Artikel vergleicht der Autor eine Vielzahl von Studien zur Reduktion der Schmierschicht in Implantatbohrungen durch Laserbestrahlung sowie konventionelle Desinfektionsmethoden mit den Ergebnissen seiner eigenen Forschung. Im Anschluss an die Auswertung von fast 70 Quellen der zeitgenössischen Literatur zum Thema sowie der eigenen Studienergebnisse gelangt der Autor zu dem Fazit, dass die Entfernung der Schmierschicht durch den Dentallaser keine regulären Muster aufweise. Obwohl potenziell eine Abhängigkeit zwischen Applikationszeitpunkt, -dauer und Effektivität bestünde, konnte in der vorliegenden Studie keine Relation zwischen diesen Faktoren nachgewiesen werden. Der Autor weist jedoch darauf hin, dass umfassendere Ergebnisse erreicht werden könnten, wenn zukünftige Studien weitere Faktoren in die Auswertung einschlössen. Hierzu zählen Bakterien- und Pilzkeime in den Kavitäten sowie das *in-vitro* Umfeld und Vergleiche zu verschiedenen Laseranwendungen und der chemisch-basierten Schmierschichtentfernung. Die Ergebnisse der vorliegenden Studie legen abschließend nahe, dass die Anwendung eines Er,Cr:YSGG-Lasers bei 1,5 und 3 Watt, in Kombination mit Airbrush und Wasserkühlung für eine Dauer von 20 bis 40 Sekunden am effektivsten sei. Mit der Reduktion der Anwendungsdauer verringere sich dabei die Wahrscheinlichkeit für Gewebeschäden.

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Please **send in your abstract until 30 June 2016**

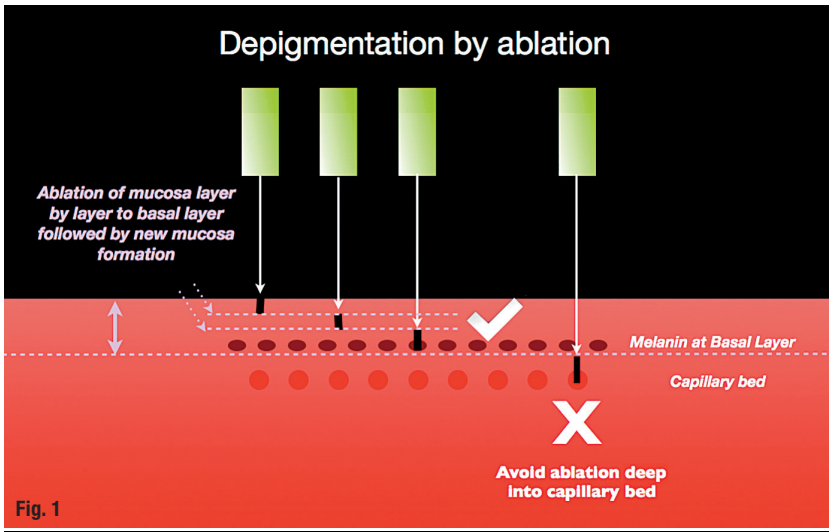
Non-ablative melanin depigmentation of gingiva

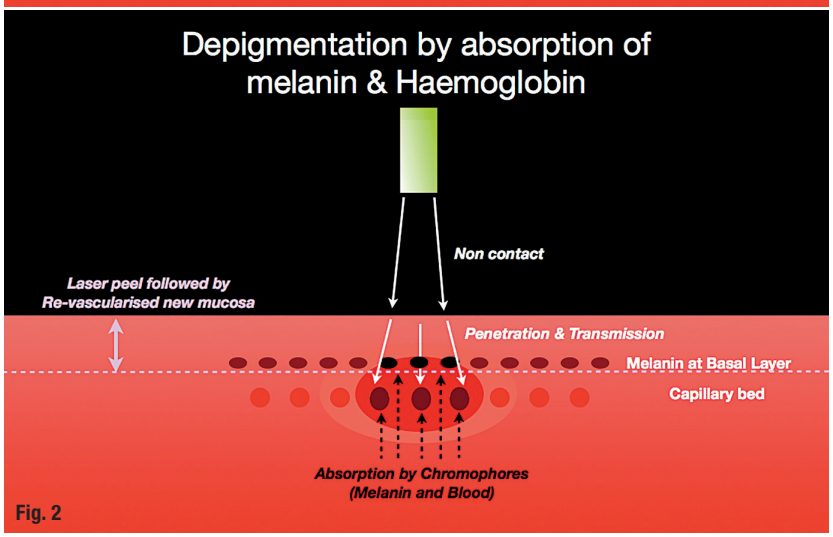
Author: Dr Kenneth Luk, Hong Kong

Introduction

Melanin depigmentation of gingiva using various laser wavelengths have been reported for over ten years.[1–5] Layer by layer, the mucosa is ablated to the basal layer of the epithelium where the melanocytes are located. The use of lasers have been compared with the use of scalpel and diamond bur (Fig. 1).[6–9] By incorporating the optical properties and absorption characteristics of 810 nm together with specific power parameters, a non ablative technique was developed (Fig. 2).[10,11]

Fig. 1: Depigmentation by ablation.
Fig. 2: Depigmentation by absorption of melanin and haemoglobin.





Another similar non-ablative technique described as microcoagulation was also reported using a 20 W 980 nm diode laser.[12] The 445 nm blue wavelength was introduced in the dental market in 2015. By using 320 µm uninitiated fiber delivering 1 W continuous wave of 445 nm, the same non-ablative procedure and result can also be realized.

Background with non-ablative technique

Diode laser at 810 nm is poorly absorbed in water, but it is well absorbed by pigment such as haemoglobin and melanin. The use of high power, short pulse duration concentrated the thermal energy on the surface over deep tissue thermal conduction with lower power and long pulse.[13,14]

The author has used the 810 nm wavelength (elexxion Claros 810 nm diode laser, elexxion AG, Singen, Germany) with the power parameters of 30 W, 20 kHz, 16 µsec giving an average power of 10 W. Under local anaesthesia, a non-initiated 600 µm fiber was used. The fiber was placed at a distance of 2 mm to 5 mm from the pigmented mucosa. Coagulation can be observed with immediate effect upon irradiation.

A constant movement must be performed in order to avoid thermal damage deep into the tissue. Water irrigation can be used as coolant

Figs. 3–6: Depigmentation on upper arch using 810 nm at 30 W, 20 kHz, 16 µsec, pre-op (Fig. 3), immediate coagulation (Fig. 4), three weeks post-op (Fig. 5), eight years post-op (Fig. 6).

during the treatment. There is no surface ablation of the pigmented mucosa but rather the haemoglobin and melanin absorbing the laser energy (Fig. 2). This technique (Figs. 3–6) showed a treatment time of two minutes compared to the ablative technique time up to 30 minutes in an area of first premolar to first premolar of one dental arch.

The wavelength of 445 nm is much better absorbed by melanin and haemoglobin than 810 nm (Fig. 7). Hence, a much lower power density may be used to produce the same effect.

Case outline

A 26-year-old female patient of Chinese ancestry presented with melanin pigmentation in 2007. Congenital melanin pigmentation of the labial gingiva was diagnosed. Depigmentation on the upper arch using 810 nm at 30 W, 20 kHz, 16 µsec was carried out. Eight years post-op showed mild relapse of pigmentation, but the patient was satisfied with the cosmetic appearance (Figs. 3–6). She now wanted the melanin pigment on her lower anterior segment to be removed (Fig. 8).

Purpose

Pigment removal in the requested sites was discussed using 445 nm diode laser. The same technique would be used and the patient consented to the treatment.

Material and method

SIROLaser Blue (Dentsply Sirona) with an emission wavelength of 445 nm was used at 1 W, CW delivered through a 320 µm fiber.

Procedure

Depigmentation technique is the same as described with the 810 nm wavelength (above). Under local anaesthesia, a non-initiated 320 µm fiber delivers the energy at a distance of 2 mm to the pigmented area with constant movement.

Figs. 7: Absorption Spectra of biological materials. (Courtesy of J. Meister)

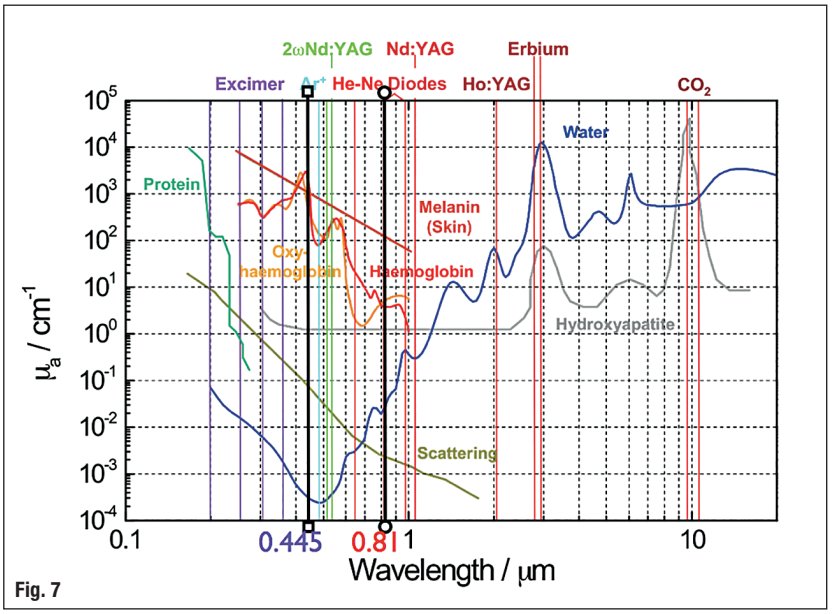


Fig. 7


Fig. 8


Fig. 9


Fig. 10


Fig. 11

Figs. 8–11: Depigmentation of lower arch using 445 nm at 1 W CW, pre-op (Fig. 8), immediate post-op (Fig. 9), one day post-op (Fig. 10), one day post-op laser peel between 31, 41 (Fig. 11).

Immediate change to pink colour without surface ablation of the pigmented mucosa was observed. The procedure took approximately 40 seconds to complete between lower left and right canine region.

Results

In this case, the mucosa turns pink without any signs of surface mucosal ablation except one spot between teeth 41, 42 (Fig. 9). Sub-surface coagulation of blood vessels gave a pink coloured appearance. There was very mild post-op discomfort for about one hour after loss of the anaesthetic effect. No analgesics were required as the discomfort feeling disappeared fast.

Laser peeling of mucosa between 31 and 41 was noted during photograph taking at one day post-op review (Figs. 10 and 11). The three day post-op photo taken by the patient showed that the laser peel disappeared with new gingival mucosa formation (Fig. 12). Two weeks post-op showed complete recovery of the gingival mucosa without melanin pigmentation (Fig. 13).

Discussion

There has not been much information on this new wavelength. From Fig. 7, the absorption coefficient for haemoglobin is estimated at $7x10^2/cm^{-1}$ and $10^3/cm^{-1}$ for melanin. Penetration depth for haemoglobin is calculated at 140 µm and 10 µm for melanin. The penetration depth of haemoglobin and melanin with 810 nm are 2 mm and 0.1 mm respectively. Furthermore, scattering curve showed less tissue scattering effect with 445 nm than 810 nm.

Fig. 12: Three days post-op (photo taken by patient on holiday).
Fig. 13: Two weeks post-op.


Fig. 12


Fig. 13

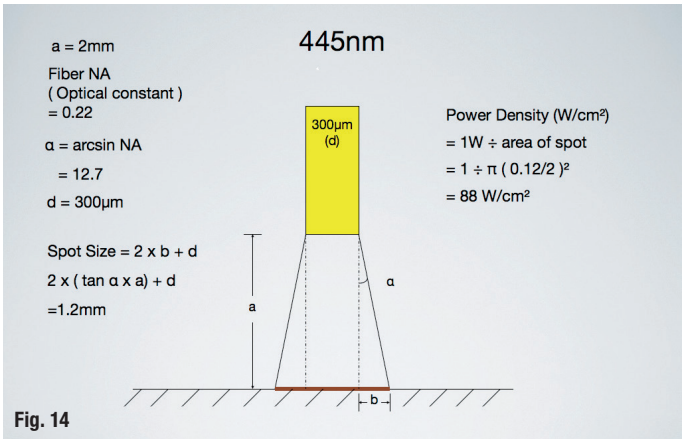


Fig. 14

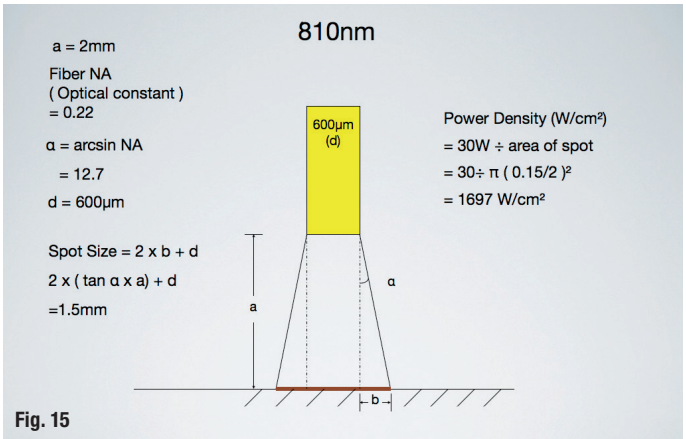


Fig. 15

In view of the low scattering effect together with high absorption of haemoglobin and melanin to 445 nm, 1 W CW was used. Power density of 88 W/cm² (Fig. 14) delivering at 88 J/cm² fluence at 2 mm distance was calculated. Although the power density of 1,697 W/cm² (Fig. 15) delivering 543 J/cm² fluence used by 810 nm is higher than 445 nm delivered, the eight years post-op showed stable gingival contour with no recession (Fig. 6). The understanding of the optical properties of the wavelength, power parameters and laser tissue interaction are important information for the clinician to achieve the desired treatment outcome.

Conclusion

The use of 1 W CW 445 nm blue diode laser is effective in non-ablative depigmentation of oral mucosa. This non ablative technique provide immediate aesthetic result with very short procedure time. To the author's knowledge, this is the first case presented using 445 nm for melanin depigmentation._

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

Dr Luk reports no potential conflicts of interest.

Fig. 14: Diagram 3.
Fig. 15: Diagram 4.

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Kurz & bündig

Seit mehr als zehn Jahren wurde bereits über eine Melanin-Depigmentierung durch Laser verschiedener Wellenlängen berichtet.[1–5] Schicht für Schicht wird die Mukosa bis hin zur Basalschicht des Epitheliums abgetragen, wo sich die Melanozyten befinden. Für diesen Prozess liegen Vergleiche zwischen Laser, Skalpell und Diamantbohrer vor (Abb. 1).[6–9] Durch die Nutzung der optischen Eigenschaften und Absorptionscharakteristiken der Wellenlänge 810 nm gemeinsam mit spezifischen Parametern wurde eine nicht-ablative Technik entwickelt, die als Mikrokoagulation beschrieben wurde.[12] Im Jahr 2015 wurde die Wellenlänge 445 nm auf dem Dentalmarkt vorgestellt. Durch Anwendung einer nicht initiierten 320 µm-Faser wird kontinuierlich eine Wellenlänge von 445 nm und 1 W abgegeben, sodass bei gleichem Vorgehen wie bei den konventionellen Methoden dieselben Ergebnisse erzielt werden können. Der SIROLaser Blue (Dentsply Sirona) mit einer Wellenlänge von 445 nm wurde im vorliegenden Fall mit 1 W CW und einer 320 µm-Faser verwendet. Die Depigmentationstechnik ist die gleiche, wie sie für eine Wellenlänge von 810 nm beschrieben wird. Unter Lokalbetäubung wurde die Bestrahlung, wie beschrieben, aus einer Entfernung von 2 mm zur pigmentierten Fläche mit konstanter Bewegung ausgeführt. Dabei wurde ein sofortiger Koagulationseffekt beobachtet. Die pigmentierte Mukosa wurde nicht direkt bestrahlt, und die gesamte Prozedur dauerte etwa 40 Sekunden, bis sie bei 1 W CW in der unteren linken und rechten Eckzahnregion beendet wurde (Abb. 8–11). Die Anwendung des blauen 445 nm-Diodenlasers bei 1 W CW ist eine effektive, nicht-ablative Depigmentationstechnik für die orale Mukosa. Sie ermöglicht sofortige ästhetische Ergebnisse bei einer kurzen Behandlungsdauer. Nach aktuellem Kenntnisstand des Autors handelt es sich beim vorgestellten Fall um den ersten Bericht zur Melanin-Depigmentation bei 445 nm.

Histological effects of NightLase® in the soft palate of rats

A pilot study

Authors: Aslıhan Üsümez, Tugba Unver, Emre Aytugar & Tugçe Kıran, Turkey

Introduction

Snoring is a common problem in adults that affects between 20–50 % of the population.[1–3] Although there is no exact definition of snoring, the term indicates a breathing sound that arises during nighttime or daytime sleep.[4] The sound of snoring is usually a consequence of the vibration of pharyngeal soft tissue (most commonly soft palate), so treatment focuses on reducing these vibrations.[4,5]

There are many types of surgical treatment procedures that have been defined up to now.[5–9] In addition to these surgical treatments, some non-surgical procedures are available.[10,11] Among the treatment options, the main goal is to find a simple, safe and effective procedure that benefits a speedy recovery and return to normal daily life.

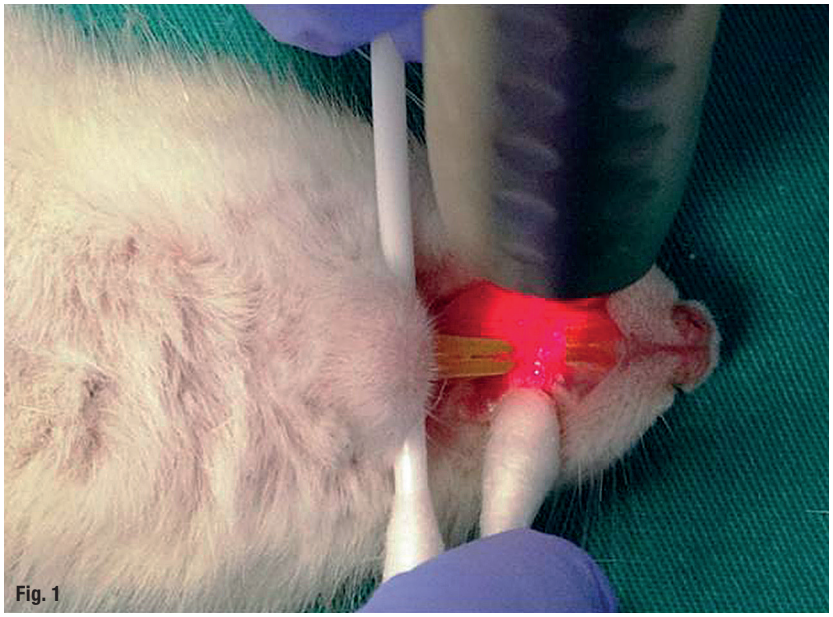

Fig. 1

Fig. 1: Application of the PS04 handpiece to the soft palate of the rat.

In the past, Nd:YAG laser irradiation was used for stiffening the soft palate using a low energy method as a less invasive alternative. Nd:YAG laser stiffening of the soft palate was reported to be simple, safe and effective for reducing the length of the soft palate in the canine model.[3] Recently a new laser irradiation tool was introduced in the market known as NightLase®, which claims to be a non-invasive and effective method for the treatment of snoring and sleep apnea. This treatment is reported to be a fast, safe and efficient method for decreasing the amplitude of snoring through the use of superficial Er:YAG laser light.[10] However, there is no information in the literature about the histological effects of this treatment model on living tissues. Therefore, this study aims to assess the effects of Er:YAG laser irradiation on the histological structures of the soft palate in rat models.

Materials and methods

Twenty adult female Wistar albino rats weighing 200 to 250 g were used in this study. Rats were randomised into two groups as an experimental (n=10) and a control group (n=10) following the approval of an animal use protocol by the Bezmialem Vakif University Animal Care Committee.

The rats were anaesthetised and Er:YAG laser energy (LightWalker AT, Fotona, Slovenia) was delivered with a snoring handpiece (PS04, Light-

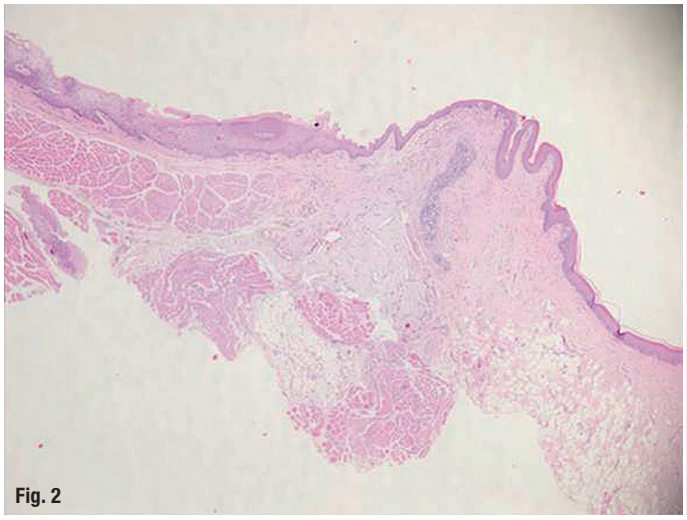
Fig. 2

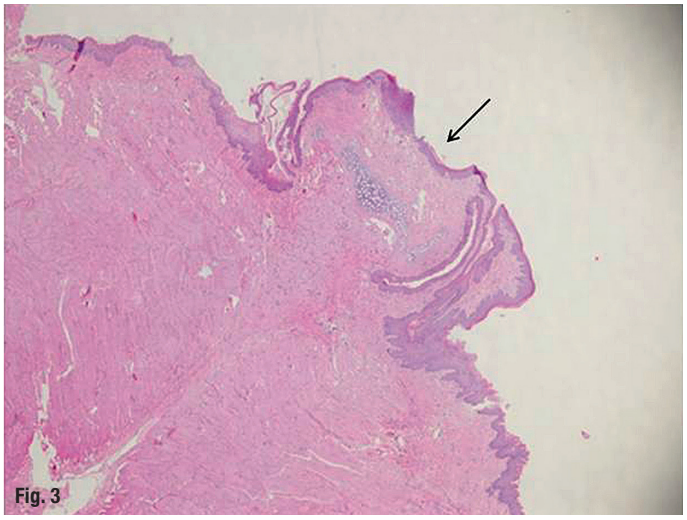
Fig. 3

Fig. 2: Normal mucosa of the control group.
Fig. 3: Acute shrinkage of the soft palate.

Walker AT, Fotona, Slovenia) in non-contact mode (1.15 W, 2 Hz, 1.57 J/cm^2, SMOOTH mode, Fig. 1). The surface of the soft palate of each rat in the experimental group was irradiated for two minutes. The laser beam was manually guided across the soft palate horizontally. The control group did not receive any treatment (Fig. 2).

The animals were sacrificed after 24 hours, one week, three weeks or five weeks. The soft palates of each rat were removed by excisional biopsy. The specimens underwent histological examination with an optical microscope (CX 31, Olympus, Tokyo, Japan) used for the examination (X4 and X10 zoom).

Sections were evaluated by an experienced pathologist without any knowledge of the type of animal group and inflammation; contraction was reported as grading from 1+ to 3+. Statistical analysis was done with Statistical Package for Social Sciences (SPSS) for Windows 10 and, where appropriate, Mann-Whitney U-Test and Spearman's rho, with P values less than 0.05 considered significant.

Results

The overlying mucosa of each rat in the experimental group was intact, with some superficial blanching, but carbonisation of the tissue was not observed. All animals recovered normally and tolerated normal intake of food and water within 1 ± 1.5 hours after reaction from the anaesthesia, without any complications thereafter. There was no exposed wound, bleeding or necrosis to be found when the soft palate was observed macroscopically after sacrificing the animals.

A noticeable contraction of the soft palate occurred immediately after laser application (Fig. 3). After the first 24 hours, contraction of the tissue was labeled as level 2.5. Shrinkage decreased gradually and was scored as 1.6 at the first week, 1.3 at the third week, but was still present at the end of fifth week at level 1.

Discussion

This study evaluated the contraction of the soft palate of rats after Er:YAG laser irradiation. Histologically, acute shrinkage was observed in the experiment (Fig. 3). Snoring is a problem that affects the majority of the population. A narrowed pharyngeal airway and extra vibratory tissue are what cause snoring,[5] and the general aim of treatment options is to expand the airway and eliminate the redundant vibratory structures. The optimal treatment would effectively decrease the sound of snoring while being simple and safe.[4]

Research on surgical approaches of snoring and sleep apnea has focused on causing less tissue damage. Haytaoglu et al. compared the effects of palatal implants and uvulopalatal flaps on snoring and sleep apnea management.[7] They reported that hospitalisation, preoperative laboratory studies and loss of labor make uvulopalatal flaps an expensive and non-preferred method for snoring and sleep apnea treatment, while palatal implants could be placed in shorter time under local anaesthesia with a lower rate of morbidity.

Wang et al. used Nd:YAG laser as an alternative to uvulopalatopharyngoplasty (UPPP) on an animal model and demonstrated the stiffening and elevation of the soft palate.[3] They reported that Nd:YAG laser seemed to be effective in palate shortening and stiffness of the canine, but it remained to be determined if it would produce the same effects in human subjects.

Traditional surgical and non-surgical treatments do not provide satisfactory consequences, and surgical methods are also associated with some significant risks such as pain, haemorrhage, infection and malfunction.[3,4] Er:YAG laser irradiation, on the other hand, is reported to be a non-invasive and more effective method available for treating snoring and sleep apnea.[10,14] The method uses Er:YAG laser energy, which causes a contraction of the collagen fibers and provides an opening of the airway to decrease snoring and apnea with a 90% success rate. No side effects have been reported after Er:YAG laser irradiation in the treatment of snoring.[10] Similarly, Dovsak et al. showed that Er:YAG laser treatment is a safe method and is easily tolerated by patients.[14]

In this study, mucosal contraction can be seen immediately after laser irradiation as a result of the thermal effect on the tissue. Due to the contraction of the pharyngeal soft tissue, the airway expanded and vibrations of the pharyngeal soft tissue were eliminated. Meanwhile, the mucosa remained intact, with no evidence of bleeding, severe inflammation, carbonisation, necrosis or any other complication.

Among the literature, this is the first study to evaluate the contraction of the soft palate from a histological basis after NightLase® application. The limitations of the current study include using a small number of animals because of animal-use protocols, which unfortunately makes it difficult to state predictive value. Another limitation is the need for sacrification of the rats for histological analysis, which made repetitive application of NightLase® impossible. Future studies with higher numbers of subjects and repetitive laser irradiation are needed to be able to draw more definitive conclusions.

Conclusions

The present study indicates that Er:YAG laser irradiation with a snoring handpiece (PS04) causes acute shrinkage of the mucosa. This contraction decreases gradually but is still present at the end of fifth week. This treatment option may be considered safe due to the absence of any carbonisation, necrosis or haemorrhage._

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

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Kurz & bündig

Schnarchen betrifft die Mehrheit der Bevölkerung. Verursacht wird es durch eine Verengung der Luftröhre und Vibrationen der umgebenden Gewebe. Schnarchbehandlungen zielen darauf ab, die Atemwege zu erweitern und Strukturen, die wiederkehrende Vibrationen begünstigen, zu eliminieren. Vor Kurzem wurde ein neues Gerät zur Laserbestrahlung vorgestellt (NightLase®, Fotona), welches eine nichtinvasive und effektive Methode zur Behandlung von Schnarchen und Schlafapnoe darstellen soll.

Die vorliegende Studie ermittelt den Effekt einer Bestrahlung durch Er:YAG-Laser auf die histologischen Strukturen des Gaumensegels bei Ratten. Insgesamt 20 ausgewachsene, weibliche Wistar-Albinoratten mit einem Gewicht zwischen 200 und 250 g wurden in dieser Studie untersucht. Die Ratten wurden randomisiert in zwei Gruppen (n = 10) eingeteilt, wovon eine Gruppe die Kontrollgruppe darstellte und nicht behandelt wurde. Die Tiere der zweiten Gruppe erhielten nach Anästhesie eine Laserbestrahlung (LightWalker AT, Fotona, Slovenia) durch ein spezielles Schnarch-Handstück (PS04, LightWalker AT, Fotona, Slovenia) im Non-Kontakt-Modus (1,15 W, 2 Hz, 1,57 J/cm², SMOOTH mode, Fig. 1). Dabei wurde die Oberfläche des Gaumensegels für zwei Minuten bestrahlt und der Laserstrahl manuell horizontal über das Gaumensegel geführt.

Die Auswertung der histologischen Ergebnisse lässt den Schluss zu, dass eine Er:YAG-Bestrahlung durch ein Schnarch-Handstück (PS04) ein starkes Zusammenziehen der Mukosa bewirkt. Dieses war auch fünf Wochen nach der Laserbehandlung noch messbar, wenn auch stark abgeschwächt. Da keine Karbonisation, Nekrose oder Blutung festgestellt wurde, kann diese Behandlung als sicher bewertet werden.

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Probing for alternatives

The prevention of dental fear

Author: Dr Anton Kasenbacher, Germany

The following video recently went viral as it illustrates how dental fear impacts both patient and dentist:

Literature

[1] Zahnarzt-Angst vor Behandlung: Wie stark fürchten Sie sich vor den folgenden zahnärztlichen Behandlungen? Statistische Erhebung der Toluna Germany GmbH i. A. der DEVK, April 2009.

[2] Kani, E.; Asimakopoulou, K.; Daly, B.; Hare, J.; Lewis, J.; Scambler, S.; Scott, S.; Newton, J. T.: Characteristics of patients attending for cognitive behavioural therapy at one UK specialist unit for dental phobia and outcomes of treatment. British Dental Journal 2015; 219(10): 501–506.

[3] Walther, W.: Der Einfluss von Präparationen mit Turbine und Schnellaufwinkelstück auf die menschliche Pulpa. Vergleichende histologische Untersuchungen. Inaugural-Dissertation, Albert-Ludwigs-Universität, Freiburg i. Br., 1984.

[4] Pantas, E.; Jöhren, H.P.: Zahnbehandlungsangst – eine prospektive Studie zur anxiolytischen Wirkung von Musik während der Zahnbehandlung. Deutsche Zahnärztliche Zeitschrift 2013; 68(5):288–295.

After scientists from the University of São Paulo have recently investigated a method to replace injection needles—one of the main triggers of dental anxiety—by a technique entailing less potential for dental fear, this article discusses the factor which is seen as the most prominent cause for dental phobia worldwide: the dental drill.[1]

In a study recently published by the *British Dental Journal*, 77 per cent of the patients surveyed stated to be very afraid of upcoming dentaldrill treatments.[2] Although the electrical dental drill, which was already patented in 1875 by US dentist George F. Green (US-Patent No. 171121 A) is seen as the gold standard for caries therapy and preparation procedures, most patient anxieties are related with this traditional dental tool, as its causing pain and tissue damages seems to be an inherent principle of its application.[3] For this reason, anaesthetic injections prior to treatment are inevitable in most cases.

Thus, in their prospective clinical investigation of dental fear, authors Pantas and Jöhren refer to a number of analyses which indicate that 75 per cent of the adult population are batteling dental anxiety. In 5 to 12 per cent of the patients, dental phobia is so pronounced that they refuse to be treated.[4] Moreover, some studies imply that about 95 per cent of all dental offices do not offer any strategies to prevent dental anxiety in the first place, according to Pantas and Jöhren.

Ultrashort pulsed lasers form an alternative to both fear-inducing dental drills (turbine, high-speed engine) and all dental lasers on the market so far. Applying pulse durations of less than 10 picoseconds and pulse energies of less than 50 µJ stop heat and shock waves from spreading towards the dental pulp, resulting in a pain-free dental treatment without any tissue damages. After 141 years

of technical advances in dental therapy, the arrival of ultrashort pulsed lasers has finally achieved complying to the Hippocratic principal of "primum non nocere" (First, do no harm)._

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Nachgebohrt – Zahnarztangst

Auf der Suche nach Alternativen

Autor: Dr. Anton Kasenbacher, Deutschland

[Picture: © alphaspirit]

Nachdem Forscher der Universität São Paulo jüngst eine Methode erforschten, um die von vielen Patienten gefürchtete Injektionsnadel, eine der Hauptursachen der weit verbreiteten Zahnarztangst, durch eine Technik mit weniger Angstpotenzial zu ersetzen, beschäftigen wir uns im vorliegenden Artikel mit der weltweit am häufigsten genannten Ursache für Zahnarztphobie: dem Dentalbohrer.[1]

In einer vor Kurzem im *British Dental Journal* veröffentlichten Studie gaben 77 % der befragten Patienten an, sehr ängstlich zu sein, wenn ihnen eine Behandlung per „dental drill" bevorstünde.[2] Obwohl der bereits 1875 vom amerikanischen Zahnarzt George F. Green patentierte elektrische Dentalbohrer (US-Patent No. 171121 A) bis heute als Mittel der Wahl für Kariestherapie und Zahnpräparation gilt, sind die meisten Patientenängste mit ihm verknüpft, da er prinzipiell bedingt Schmerzen sowie Gewebeschäden verursacht,[3] weshalb die Betäubungsspritze in der Mehrzahl der Fälle unumgänglich ist.

So zitieren die Autoren Pantas und Jöhren in ihrer prospektiven klinischen Untersuchung zur Zahnbehandlungsangst mehrere Analysen, die zu dem Schluss kommen, dass 75 % der Erwachsenenbevölkerung mit einer mittleren bis starken Zahnarztangst zu kämpfen haben, die bei 5 bis 12 % der Zahnarztpatienten so stark ausgeprägt ist, dass sie deshalb die Behandlung ganz vermeiden.[4] Darüber hinaus ginge, so Pantas und Jöhren weiter, aus einigen Studien hervor, dass etwa 95 % aller Zahnarztpraxen ihren Patienten keinerlei Techniken zur Angstvermeidung anbieten.

Eine Angst eliminierende Alternative zum Dentalbohrer (Turbine, Schnellläufer) sowie zu allen bis dato am Markt verfügbaren Dentallasern stellt erstmals der Ultrakurzpulslaser dar. Die Verwendung von Pulsdauern unter 10 Pikosekunden und Pulsenergien unter 50 µJ haben zur Folge, dass sich Wärme- sowie Schockwellen nicht mehr in Richtung Zahnpulpa ausbreiten mit dem Resultat einer schmerzfreien Zahnbehandlung ohne Gewebeschäden. Damit existiert nach 141-jähriger technischer Weiterentwicklung eine zahnmedizinische Therapie per Ultrakurzpulslaser, die endlich dem hippokratischen Grundsatz des „primum non nocere" (d.h. zuerst einmal nicht schaden) gerecht zu werden vermag._

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Dass die Zahnarztangst ein hochaktuelles Thema ist, das Arzt und Patient gleichermaßen betrifft, zeigt dieses kürzlich viral gegangene Video:

Literatur

[1] Zahnarzt-Angst vor Behandlung: Wie stark fürchten Sie sich vor den folgenden zahnärztlichen Behandlungen? Statistische Erhebung der Toluna Germany GmbH i. A. der DEVK, April 2009.

[2] Kani, E.; Asimakopoulou, K.; Daly, B.; Hare, J.; Lewis, J.; Scambler, S.; Scott, S.; Newton, J. T.: Characteristics of patients attending for cognitive behavioural therapy at one UK specialist unit for dental phobia and outcomes of treatment. British Dental Journal 2015; 219(10): 501–506.

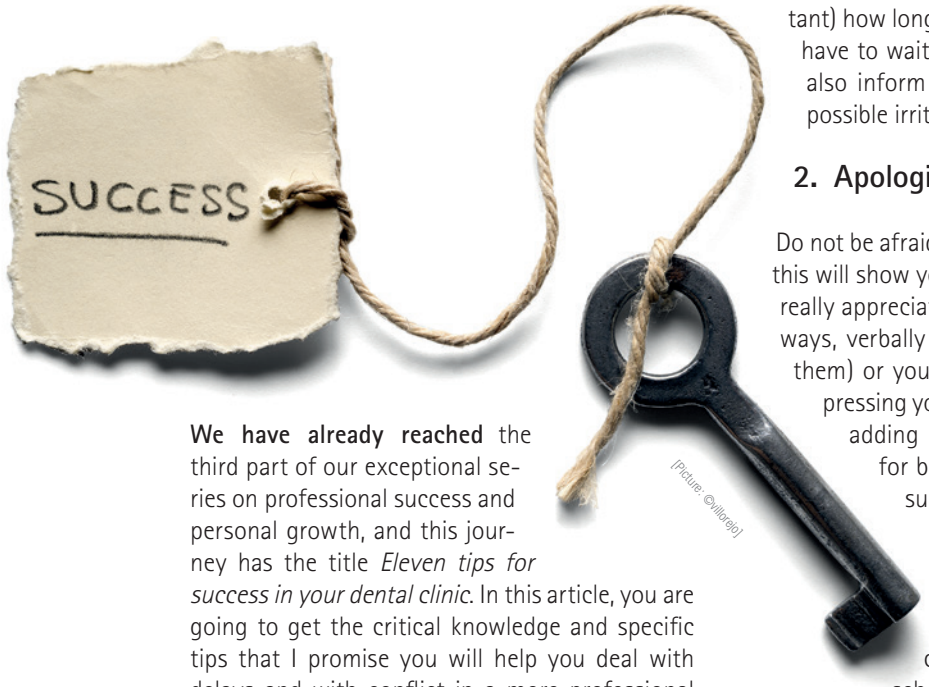
[3] Walther, W.: Der Einfluss von Präparationen mit Turbine und Schnellaufwinkelstück auf die menschliche Pulpa. Vergleichende histologische Untersuchungen. Inaugural-Dissertation, Albert-Ludwigs-Universität, Freiburg i. Br., 1984.

[4] Pantas, E.; Jöhren, H.P.: Zahnbehandlungsangst – eine prospektive Studie zur anxiolytischen Wirkung von Musik während der Zahnbehandlung. Deutsche Zahnärztliche Zeitschrift 2013; 68(5):288–295.

Eleven tips for success in your dental clinic

Part III: CASCO and PEC

Author: Dr Anna Maria Yiannikos, Germany & Cyprus



[Picture: ©villorejo]

We have already reached the third part of our exceptional series on professional success and personal growth, and this journey has the title *Eleven tips for success in your dental clinic*. In this article, you are going to get the critical knowledge and specific tips that I promise you will help you deal with delays and with conflict in a more professional and efficient way! Now let's start with delays!

As dental practitioners, we work with patients that have special needs and difficulties, therefore sometimes we find ourselves in trouble due to inevitable delays. My question here is: How can we deal with them? However, most essential is, how can we control them? Be aware of the acronym CASCO, which stands for control, apologise, solution, change, and offer.

1. Control

You can control your delays by assigning to your assistant to remind you every five minutes for the next appointment that awaits you. She can become your personal alarm clock that will wake you up and remind you of your next appointment. You should also inform your "alarm clock" (aka assistant) how long exactly your next patient will have to wait in case of delays, so she can also inform him/her promptly and avoid possible irritability.

2. Apologise

Do not be afraid to say sorry to your patients, this will show your humane side and they will really appreciate it. You can do it in so many ways, verbally (immediately when you face them) or you can send them an email expressing your apologies. But please avoid adding annoying excuses, like 'Sorry for being late, but I had a difficult surgery' or 'I am so sorry, but it is not my fault as the previous appointment came 30 minutes late'. Do you think that our patients should care about our uncontrolled schedule? Or worse, the previous patient? Absolutely not! Please remember to avoid any excuses that will make them more angry or frustrated.

3. Solution

Give them a solution for their next appointment. For example, you can say, "I suggest that next time we can book you especially the first morning appointment to ensure no delays."

4. Change

Do not be afraid to make the change—and change the habit of having delays at your clinic and create a clinic with no or limited delays. Trust me, this will add value to your clinic's image—be aware that the best dentist is the one that respects his patients by being punctual.

5. Offer

Be ready to give them a complimentary treatment to show your apologies once more, they will really love that. Avoid phrases like "I will give you a free treatment", instead explain to them that 'this treatment is a gift from us'. You can combine two treatments without charging the second one. In this way, you will raise the value of the treatment for your patients. At the same time, explain the separate cost of each treatment and the benefits you just gave to your patients without mentioning the word free. For example, "I will now do a dental cleaning and in addition we will do a polishing session with the new air flow machine that would cost 50 Euros. You will like the results much more than the ones from the simple dental cleaning, your teeth will shine more and the stains between your teeth will disappear completely."

Now let's go to the sixth tip, which is as essential as the previous one and concerns how we can deal with conflicts. Unfortunately, there are times that we have to face problematic patients or unpleasant situations with our employees or our associates. How can we face these conditions? Apply PEC to successfully deal with them. PEC stands for:

1. Perception

Name it! Behave as an adult and get rid of fear and just say the problem. Think what the worst scenario is. By making this risk management process, you immediately acknowledge the fact that you could face it as well. Be ready to listen to the other party, ask them about their opinion, maybe their perception is completely different from yours.

2. Emotions

Deal with them and then start the conversation. You should not start a discussion in case you still feel angry about the person or the issue. Be well prepared and avoid to take anything personally.

Be ready to express your feelings, you might be surprised with the other party's unawareness of the problem. Remember to show your empathy with phrases like "I understand you", instead of "You are right". It is a pity to miss the wood for the trees!


[Pictur: ©Sergey Nivens]


[Picture: ©Pressmaster]

In the upcoming issue, we will analyze two brand new tips and practical solutions that will help you to reveal new opportunities and potential of your dental clinics. Until then, remember that not only you are the dentist in your clinic, but you are also its manager and leader.

You can always send me your questions and requests for more information and guidance via dba@yiannikosdental.com or via our facebook account. Looking forward to our next trip of business growth and educational development!_

3. Communication

A constructive communication is essential to build relationships. Therefore, speak your truth without hurt feelings, ask questions to reveal the issue, sit together to find a win-win solution and make the gesture! This means you can make a warm handshake, or you can hug the other party (based on the type of your relationship) showing your positive attitude to resolve the problem. Finally, always remember to be calm, express some humor, and be humane!

contact

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Kurz & bündig

Im ersten Teil der Serie „11 Tipps zum wünschenswerten Erfolg in Zahnkliniken" ging es darum, sich als Praxisinhaber intensiv mit den eigenen Fähigkeiten, Stärken und Schwächen auseinanderzusetzen. Der zweite Teil befasste sich im Anschluss mit der Suche nach dem idealen Praxismitarbeiter: Vier Schlüsselqualifikationen helfen dabei, den geeigneten Mitarbeiter auszuwählen, und fünf einfache Maßnahmen können dazu beitragen, diesen in der Praxis zu halten und zu motivieren.

Im nun vorliegenden dritten Teil geht es ganz um den Umgang mit den Patienten. Die Autorin zeigt den Lesern in fünf einfachen Schritten, wie sie ihr Terminmanagement optimieren können und auf unvermeidbare Verzögerungen und Wartezeiten reagieren: Dabei sollte die erste Maßnahme sein, die Terminabfolge stärker zu kontrollieren (control) und so Verzögerungen zu minimieren. Sollten diese trotzdem unvermeidlich sein, ist eine Entschuldigung beim Patienten (apologise) unabdinglich, gefolgt von einem individuellen Lösungsangebot (solution). In der Zukunft sollten lange Wartezeiten vermieden werden (change), um die Patientenzufriedenheit zu steigern und die positive Wahrnehmung Ihrer Praxis zu verstärken. Dazu können auch weitere Angebote an den Patienten beitragen (offer), wie zum Beispiel eine kostenlose Zahnreinigung.

Abschließend setzt die Autorin ihren Fokus auf den Umgang mit Konfliktsituationen: Hierbei zähle vor allem eine klare und realistische Wahrnehmung (perception). Beide Seiten sollen die Möglichkeit haben, Probleme direkt zu benennen und dabei auch gehört zu werden. Auch Emotionen (emotions) sollten offen geäußert werden, ohne jedoch aus der Diskussion einen Streit werden zu lassen. Bei allem gilt: Eine konstruktive Kommunikation (communication) ist essenziell für jede funktionierende Beziehung.

Seien Sie gespannt auf die nächste Ausgabe der *laser* international magazine of laser dentistry, in der Ihnen die Autorin weitere praktische Tipps für ein optimales Erfolgspotenzial Ihrer Praxis geben wird.

laser

international magazine of laser dentistry

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Laser education at its best

AALZ Mastership courses in Greece

Author: Dr Dimitris Strakas, Greece

Since 1991, when AALZ was originally founded, a vast number of dentists have been educated and certified as laser experts. It was in 2010 that a new branch of AALZ has opened its arms in Athens and Thessaloniki, providing courses in laser dentistry for Greek and foreign dentists.

Entering its 6th year of operation, AALZ Greece has already established its position as a leader in certified education for laser dentistry. A dozen of laser safety officer courses, many diode-orientated wavelength courses, four mastership/fellowship programmes and several one-day seminars with a variety of lectures have been offered and embraced by the Greek dental world.

Even in this difficult and challenging financial period, especially in Greece, but also in Europe, we are happy to say that this year's mastership/fellowship course 2015–2016 is a big success, reaching a number of 14 participants.

The course started on October 10 and 11, 2015, with Module I, covering the laser safety officer certification, the laser construction and handling part and the ILIAS system—introduction and understanding. Module I was repeated on January 23 and 24, 2016, since several more dentists have enrolled.

We had the honour and pleasure in both circumstances to host Mr Leon Vanweersch, who wel-

Fig. 1: Leisure times and Greek cuisine dinner.
Fig. 2: Prof. Norbert Gutknecht in action.
Fig. 3: The mastership/fellowship 2015–2016 group photo.
Fig. 4: Hands-on workshop with different wavelengths.


Fig. 1

Fig. 2


Fig. 3


Fig. 4

comed the participants as the general manager of the programme and gave them an introductory speech in order to make them understand the history, qualities and advantages of AALZ's educational programmes before introducing Module I's lecturers for AALZ Greece, Dr Dimitris Strakas and Antonis Kallis. It was also the first time that Prof. Norbert Gutknecht, although not present for these modules, also welcomed the participants with a video conference call.

Coming to Module II on February 7 to 10, 2016, the group was happy and eager to listen and learn as much as possible on diode lasers in dentistry by Prof. Norbert Gutknecht himself, covering the whole spectrum of therapeutic indications. Long and interactive days always included both fun and work, which is by all means necessary in order to be more productive. Module II ended with a hands-on course, in which participants learned the handling of diode lasers and the methodology behind each specific treatment. Last but not least, we had the opportunity to demonstrate diode and Nd:YAG laser therapies on some patients in our clinic.

For the successful hands-on we have to thank the companies that supported this and provided us with their units, giving the participants the opportunity to work with the full spectrum of diode wavelengths and Nd:YAG (445 nm, 660 nm, 810 nm, 930 nm, 980 nm, 1,064 nm). In alphabetical order we would like to thank: Biolase, Fotona, Sirona and Zolar.

All our participants are already impatient with regard to Module III, which is scheduled for June 5 to 8, 2016, and Prof. Gutknecht's lectures on Erbium family lasers. This year's mastership course is scheduled to be completed in Aachen on September 29 and 30, 2016.


[Picture: ©Anastasios71]

AALZ Greece's courses are taking place in the renovated "Excelixi" Convention Center at "Domotel Kastri Contemporary Hotel" in the Kastri district, Athens. Our participants are catered throughout the days of the courses and we will have dinner nights with them and our AALZ stuff, enjoying the weather and the famous Greek cuisine. For more info on AALZ Greece's courses, visit www.aalz.gr or contact via email on aalzgreece@gmail.com_

contact

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Kurz & bündig

Seit der Gründung des AALZ im Jahr 1991 hat eine große Anzahl von Zahnärzten die Ausbildung zum zertifizierten Laser-Experten durchlaufen. Weitere Standorte des AALZ wurden 2010 in Athen und Thessaloniki eröffnet und ermöglichen seitdem die Schulung griechischer Zahnärzte sowie Kollegen aus dem Ausland in der Laserzahnmedizin. In seinem sechsten Jahr hat sich das AALZ Griechenland mittlerweile als ein führender Anbieter für die Schulung von Laseranwendungen in der Zahnmedizin etabliert. Kurse zum Arbeitsschutz und Veranstaltungen mit Fokus auf Diodenlaser sowie vier Mastership-/Fellowship-Programme und verschiedene eintägige Seminare wurden von der griechischen Dentalwelt bisher sehr positiv angenommen. Selbst angesichts der aktuellen finanziellen Herausforderungen, die sich besonders für Griechenland in den letzten Jahren ergeben haben, hat sich auch in diesem Jahr die Mastership-/Fellowship-Kursreihe mit nunmehr 14 Teilnehmern als großer Erfolg erwiesen. Mit Eröffnungsreden von Herr Leon Vanweersch im Januar und einer Videokonferenz mit Prof. Norbert Gutknecht im Februar sowie einer gelungenen Mischung aus interaktiven, praxisnahen Veranstaltungen und einem ansprechenden Freizeitangebot ist die Kursreihe gut ins neue Jahr gestartet. Modul III wird sich im Juni 2016 unter der Leitung von Prof. Gutknecht auf Erbiumlaser konzentrieren. Die finale Veranstaltung der Reihe ist dann für den 29. und 30. September in Aachen geplant.

LASOTRONIX

SMART^{M} dental diode laser—Versatile and ingenious

LASOTRONIX—a Polish manufacturer—is launching a new diode based laser platform for dentistry, the SMART^{M} series with a variety of most effective wavelengths increasing a number of applications.

SMART^{M} is offered as a combination of two lasers in one package: 10 W at 980 nm wavelength for a wide range of applications in microsurgery, endodontics, periodontology and whitening as well as 400 mW at 635 nm wavelength for cold therapies like biostimulation and photoactivated disinfection.

Combining two wavelengths in one device made our dental laser unique and one of the most advanced in the world for all soft tissue procedures. SMART^{M} is equipped with a wide range of fibers, application end tips and an advanced user interface, which makes the unit one of the most versatile dental lasers known so far. It is also upgradeable in the field by other wavelengths if needed. If you want to join us and promote our unique innovation please kindly contact us.

LASOTRONIX
ul. Żytnia 1
05-500 Piaseczno, Poland
www.lasotronix.com

Fotona

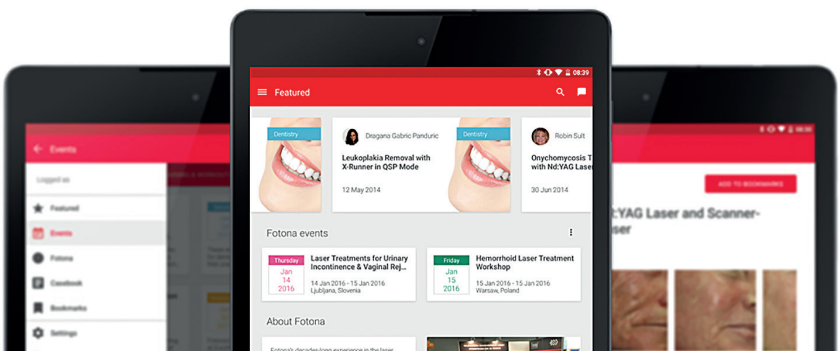
Mobile app for dentists now available

Fotona's mobile app has recently experienced a substantial growth of content, with more educational webinars and in-depth clinical reports about the latest laser procedures (with actual treatment settings). Users now enjoy access to over 180 videos, 100+ product and treatment presentations and 70 clinical cases by experts in various fields.

Users can download everything for offline use or alternatively bookmark selected content according to their needs.

The app also makes it easy to catch up on the latest news about industry events, see a calendar of upcoming trainings and workshops around the world, and keep track of relevant congresses and exhibitions where Fotona will be present. Users of the app also enjoy free access to all Laser & Health Academy publications (journals, magazines and compendiums).

All this is now available for the first time on the iPhone. The mobile app can be downloaded directly from either iTunes or the Google Play store.



Fotona
Stegne 7
1000 Ljubljana, Slovenia
www.fotona.com

Henry Schein

Recognition for ethical and socially-minded business practices

Henry Schein, Inc. (NASDAQ: HSIC) today announced its recognition by the Ethisphere Institute, a global leader in defining and advancing the standards of ethical business practices, as a 2016 World's Most Ethical Company®. This year marks the tenth anniversary of Ethisphere and the World's Most Ethical Companies designation. Henry Schein is one of 131 Ethisphere honorees, representing 54 industry sectors, 21 countries, and five continents.

Henry Schein has been recognized for the fifth consecutive year and is the only honoree in the Healthcare Products category, underscoring the Company's longstanding commitment to leading ethical business standards and practises.

"We are proud to be recognized by Ethisphere as one of the World's Most Ethical Companies alongside many of the world's most successful businesses," said Stanley M. Bergman, Chairman of the Board and Chief Executive Officer of Henry Schein, Inc. "Since 1932, our company has pursued the ideal of 'doing well by doing good'. As a result, we have created long-term economic and social value by maintaining exceptional ethical standards in our business practices and by cultivating a culture of caring."

Henry Schein
Corporate Headquarters, USA
135 Duryea Road
Melville
NY 11747, USA
www.henryschein.com

MEDENCY

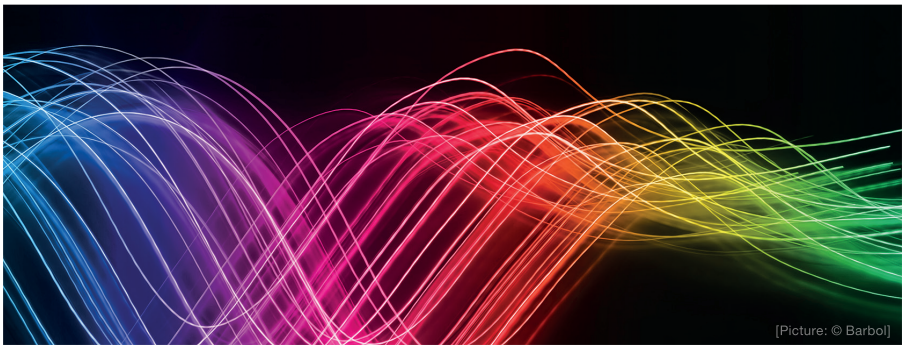
Debut at AEEDC 2016

Under the slogan "Technology, innovation, passion", this year's AEEDC saw the launch of MEDENCY, a recently founded Italian company that was built upon profound global expertise in the dental market, and dental lasers in particular. Especially in dental surgery, lasers offer numerous benefits, accelerating treatment and leading to significantly improved patient outcomes.

Over the past years, General Manager Alessandro Boschi, who is a distinguished laser dentistry expert and has collaborated with several major academies as trainer, evaluated business opportunities for the promotion of laser usage in day-to-day dentistry.

The results of this analysis are displayed in his newly founded company MEDENCY. "Our flagship product PRIMO combines state-of-art diode laser technology with innovation and the experience of MEDENCY in the dental sector. Owing to its intuitive interface, the device is easy to use," Boschi said. In addition to its products, the company offers a full range of strategy and planning—from product design development to clinical testing, governmental regulatory approval, and manufacturing quality systems certification.

MEDENCY Srl
Piazza della Libertà 49
36077 Altavilla – Vicenza, Italy
www.medency.com


[Picture: © Barbol]

Laser vibrometry initiates

Breakthrough in scaler research

By recording a scaler operating under the microscope at 10,000 times the speed of regular filming, they found tiny water bubbles forming at the end of the scaler, a process known as cavitation. According to them, the area of cavitation near the free end of the tips increased with greater power and with the amplitudes of displacement at the tips.
The formation and collapse of water bubbles create significant forces that could disrupt biofilm without touching the tooth's surface, paving the way for new instrument designs that are less invasive, the researchers said in the paper. For the study, a Satelec P5 Newtron Scaler with Satelec tips 10P, 1 and 2 operating at medium and high speeds was recorded at up to 250,000 frames per second in a water tank. The tip displacement was then recorded using scanning laser vibrometry. It is the first time that both methods have been applied to study cavitation around ultrasonic scalers. The study, titled "High speed imaging of cavitation around dental ultrasonic scaler tips", was published online on March 2 in the *PLOS One* journal.

Steady growth in the

Dental laser market

In addition to oral surgery, dental lasers are used for a variety of applications. Owing to the increasing demand in this sector, among other influences, the worldwide market for the devices will grow by a compound annual growth rate of 5.2 per cent over the next five years and is expected to exceed US$ 200 million (£ 144 million) by 2020, a new report has predicted.
According to the report, this growth will primarily be driven by the Asia Pacific market as clinicians and patients in this region are increasingly becoming aware of the benefits of laser devices. Other developments contributing to the growth of laser use include the rise in the number of aesthetic procedures on the continent and the ageing population.
The report, which was conducted by market research provider Marketsandmarkets and published by ReportBuyer in Charing, Kent, last week, analysed industry trends and the market shares of top players in the field. It also provides insights into the markets for dental lasers across various regions, exploring new distribution channels, new client bases and different pricing policies.

Source: www.dental-tribune.com


[Picture: ©everything possible]

Laser technology explores

Nanostructures with living cells

Using Laser Technology, Aleksandr Ovsianikov from the Vienna University of Technology wants to create microstructures with embedded living cells. The behaviour of cells strongly depends on their environment. If they are to be researched and manipulated, it is crucial to embed them in suitable surroundings. Aleksandr Ovsianikov is developing a laser system, which allows living cells to be incorporated into intricate taylor-made structures, similar to biological tissue, in which cells are surrounded by the extracellular matrix. This technology is particularly important for artificially growing biotissue, for finding new drugs or for stem cell research. Ovsianikov has now been awarded the ERC Starting Grant from the European Research Council (ERC) of approximately 1.5 million Euros. Interdisciplinary cooperation is crucial for this project, which connects engineering, material science, biology and chemistry. Born in Lithuania, Ovsianikov obtained his PhD in Hannover, Germany. Now he has been working at the Vienna University of Technology for two years.

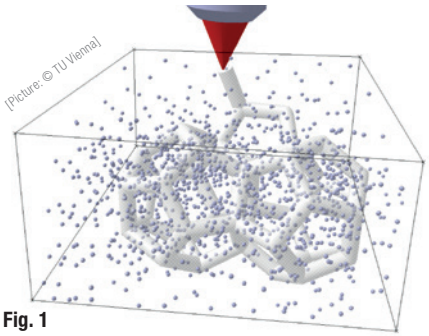

[Picture: © TU Vienna]

Fig. 1

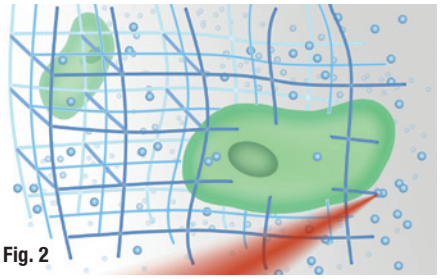


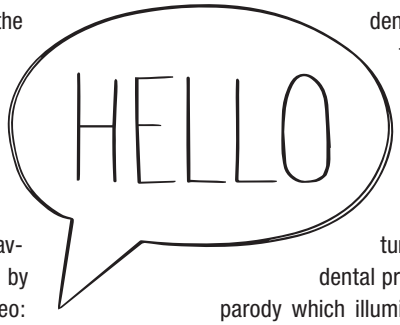
Fig. 2

Fig. 1: A laser hardens the liquid material exactly at the focal point. – **Fig. 2:** A three-dimensional grid can be produced, which keeps the cell in place.

Source: www.tuwien.ac.at

Hello from

The Dentist's side



Hardly ever is a visit at the dentist's seen as a fun event. While many are aware of the patient's side, only few take into account the dentist's view. A dental clinic from Houston, Texas, now endeavours to overcome this bias by a very special music video: they have adapted Adele's super hit "Hello" in favour of dentists worldwide. Friendly reminders remaining unheard, missed check-up appointments and the omnipresent danger of being bitten—as most people are usually seated on rather than in front of the dental chair, taking the dentist's perspective is difficult. The dental clinics New Teeth Dental Side has now turned the tables by recording a new version of Adele's "Hello", which features all aspects of the daily dental practise. The result is a funny parody which illuminates the special relationship between dentist and patient.

The following video recently went viral as it illustrates how dental fear impacts both patient and dentist:

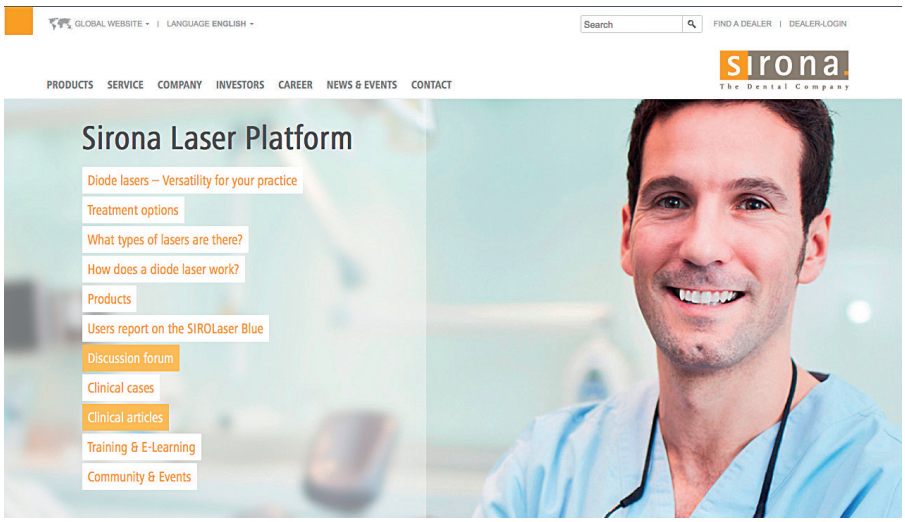
[Picture: © Kostenko Maxim]

Dentsply Sirona introduces

Online knowledge-sharing platform

The development of blue laser technology has vastly increased the possible applications of diode lasers in dentistry and, at the same time, created greater awareness of laser dentistry. The international "Sirona Laser Platform" from Dentsply Sirona, which was introduced at the beginning of March, is meant to acquaint dentists with the different areas of laser dentistry in a lively way. Dentists who wish to take advantage of this opportunity can receive free access to the knowledge-sharing platform of the global market and technology leader in the dental industry via the link www.sirona.com/en/sirolaser.

The information available on the platform is very diverse and encompasses the various types of lasers in the market, the differences between diode and traditional lasers and how they work. Additionally, a corresponding forum is included in this platform as well. This gives participants a place to exchange knowledge and information on all things related to laser dentistry with other colleagues.



Big Data tool to

Test new medicines

Australian scientists have developed a tool to map the effects of new medicines already on the market, potentially saving millions of health practitioners from prescribing medicines with lesser-known yet serious side effects. Lead researcher Dr Nicole Pratt, a senior research fellow at the University of South Australia's School of Pharmacy and Medical Sciences, has been working with the Asian Pharmacoepidemiology Network (AsPEN) to develop a mathematical algorithm that charts the temporal relationship between a new medicine and reports of adverse side effects around the globe. The rapid detection tool is able to quickly analyse large population datasets of up to 200 million people, containing information about the time a patient is prescribed a new medicine (captured at the point of purchase) and recorded hospitalisation events. "We look at the link between starting a new medicine and a hospitalisation event and determine whether there is an association between those two events", said Pratt. At the time a new medicine is first released onto the market less than 50 per cent of the side effects are known.

Source:
www.theleadsouthaustralia.com.au

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Bitte senden Sie mir das Programm zur/zum

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am 30. September und 1. Oktober 2016 in München zu.

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laser 1/16

Kenji Yoshida

Mit Laser die Zukunft ausleuchten

Liebe Leser von *laser* international magazine of laser dentistry,

wir heißen Sie alle herzlich zum 15. Kongress der World Federation for Laser Dentistry vom 17. bis 19. Juli 2016 in Nagoya, Japan, willkommen.

Der WFLD-Weltkongress findet alle zwei Jahre statt und wird nun zum dritten Mal in Japan gehalten. Damit schließt sich der 16. WFLD-Kongress an die erste Veranstaltung im Jahr 1988 in Tokyo unter der Präsidentschaft von Prof. Hajime Yamamoto und den zweiten Kongress 2002 in Yokohama unter Prof. Isao Ishikawa an.

Unter dem Motto „Light to Brighten the Future" (Licht, das die Zukunft erhellt), will der Kongress bestehende Kenntnisse in der Laserzahnmedizin und der Zahnheilkunde erweitern und neue Entwicklungen begünstigen, indem Laserstrahlung konsequent in der Diagnose und Therapie angewendet wird. Dafür wartet der Kongress mit einem abwechslungsreichen Programm auf, welches Vorträge, ein Symposium, Workshops, Posterpräsentationen, Ausstellungen und Seminare beinhaltet. Jeder Programmbestandteil wird die Laserspezialisten aus den verschiedenen technischen und medizinischen Bereichen, einschließlich der Zahnmedizin, sprichwörtlich erleuchten. Internationale Referenten werden ihre neuesten wissenschaftlichen Erkenntnisse vortragen. Es ist uns ein ernstes Anliegen, den Kongress als ein fortschrittliches Forum für wissenschaftliche Forschung, klinische Arbeit und der sowohl nationalen als auch internationalen Medizingeräteentwicklung zu begreifen.

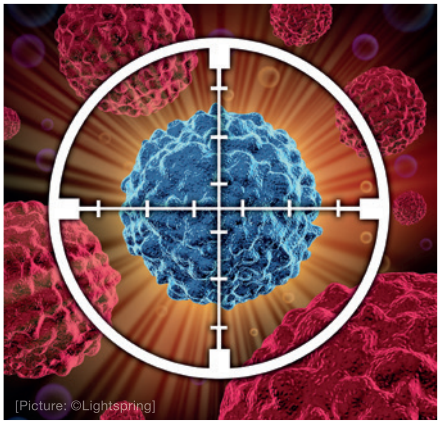
Das wissenschaftliche Programm wird durch ausgewählte Veranstaltungen, einschließlich eines Willkommensempfangs sowie eines japanischen Abendessens und Banketts, ergänzt. Wir hoffen, dass der Kongress damit nicht nur Raum für wissenschaftliche Weiterbildung, sondern auch für die Erweiterung Ihres beruflichen Netzwerks und damit Ihrer Karriere- und Forschungsmöglichkeiten bietet.

Wir freuen uns darauf, Sie zu WFLD2016 in Japan begrüßen zu dürfen.

Kenji Yoshida
Chairperson, WFLD2016

Laserfluoreszenzverfahren gegen

Rückfälle bei Mundkrebs



Wie in einer Studie[1] festgestellt wurde, erleiden Patienten, deren Mundkrebs mit einer fluoreszenzgestützten Tumorresektion (FV-Surgery) entfernt wurde, seltener Rückfälle als Patienten, die auf herkömmliche Art und Weise operiert wurden.
Für die Studie untersuchte ein Team der Universität von British Columbia in Vancouver 246 Patienten. Diese hatten entweder ein Plattenepithelkarzinom von bis zu vier Zentimeter oder eine hochgradige Läsion. 154 Patienten wurde mit FV-Surgery behandelt, 92 „normal" operiert. Es zeigte sich, das bei den 92 Prozent der Patienten mit Plattenepithelkarzinom, die mit FV-Surgery behandelt wurden, nach drei Jahren eine wesentlich niedrigere Rückfallrate vorlag – 6,5 Prozent gegenüber 40,6 Prozent bei den herkömmlich operierten Personen. Diese Operationsmethode scheint dank präziserer Resektion daher bedeutend Erfolg versprechender für die Patienten.

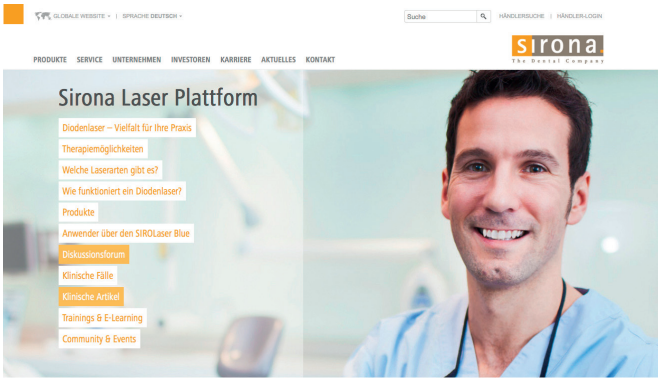
[1] Fluorescence Visualization-Guided Surgery for Early-Stage Oral Cancer. Catherine F. Poh, Donald W. Anderson, J. Scott Durham, Jiahua Chen, Kenneth W. Berean, Calum E. MacAulay, Miriam P. Rosin, JAMA Otolaryngol Head Neck Surg. Published online January 14, 2016. doi:10.1001/jamaoto.2015.3211

Quelle: doctorslounge.com

Online-Plattform zum

Austausch über Laserzahnheilkunde

Die Entwicklung der blauen Lasertechnologie hat die Einsatzmöglichkeiten von Diodenlasern in der Zahnheilkunde deutlich erweitert. Um Zahnärzte anschaulich an die verschiedenen Bereiche der Laserzahnheilkunde heranzuführen, hat Dentsply Sirona Instruments Anfang März die internationale „Sirona Laser-Plattform" eingeführt. Interessierte Zahnärzte erhalten kostenfreien Zugang zu der Plattform des globalen Markt- und Technologieführers in der Dentalindustrie über den Link www.sirona.com/de/sirolaser.
Das Informationsangebot ist breit gefächert: Besucher finden zum Beispiel Informationen dazu, welche Arten von Lasern es gibt, was Diodenlaser von klassischen Lasern unterscheidet und wie genau sie funktionieren. Zudem werden die verschiedenen Anwendungsgebiete von Dentallasern mittels Bild- und Videomaterial verständlich aufgezeigt. Erfahrungsberichte zum neuen SIROLaser Blue, klinische Fallbeispiele und die Möglichkeit, anstehende Trainings zu den einzelnen Produkten einzusehen, komplettieren das Informationsmaterial. Abgerundet wird die Plattform durch das zugehörige Forum. Hier haben interessierte Teilnehmer die Möglichkeit, sich rund um die Laserzahnheilkunde mit anderen Kolleginnen und Kollegen auszutauschen.



ZWP erscheint

Noch moderner und noch besser

Mit der ersten Ausgabe 2016 erscheint die ZWP Zahnarzt Wirtschaft Praxis und das Supplement ZWP spezial im 22. Erscheinungsjahr in einem komplett neuen Layout:
Rot als Gestaltungsfarbe rückt noch stärker in den Fokus. Gleichzeitig wurde das Magazin farblich zurückgenommen, die Seiten sind klar und übersichtlich. Dabei steht Rot für Kraft, Leidenschaft, Tatendrang, Mut und Durchsetzungsvermögen – Kernwerte und Antrieb für unsere Arbeit in 21 Jahren ZWP Zahnarzt Wirtschaft Praxis.

E-Paper

Angefangen bei der neuen Wort-Bild-Marke, die Klarheit und Stringenz, Stabilität und Modernität symbolisiert, wird das neue reduzierte Farbkonzept neben dem Cover auch im Innenteil des Heftes fortgeführt. Die neue Gestaltung, insbesondere auch die Auswahl der Schriften, unterstreichen den modernen Charakter und erhöhen zugleich die Lesbarkeit bei gleichbleibender Textmenge. Offenes und modernes Design, der bewusste Verzicht auf ablenkende Gestaltungselemente und die vereinfachte Darstellung geben dem Inhalt der ZWP mehr Raum und vermitteln Information und Bild in einem hohen ästhetischen Maß.

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