Fig. 1

25th International Annual DGL Congress

Laser technology continues to fascinate

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When a dental society celebrates its 25th annual congress, this constitutes a significant events, as only a few societies are granted to prevail for a quarter of a century. If, moreover, a dental laser society celebrates its 25th annual congress, it is a remarkable event: compared to other European dental laser societies, the DGL assumes a unique position, both by being active for 25 years and by being soundly established as a member of the DGZMK (German Society for Dental and Oral Medicine).

Fig. 2

Therefore, DGL President and co-founder Prof. Dr Norbert Gutknecht insisted on organising this special anniversary congress. And it was not long until the well-earned success became visible: The lecture hall was brimming with more than 250 participants and many DGL associates and renowned speakers from Germany and abroad followed Prof. Dr Gutknecht's call to the Bavarian metropolis Munich.

The path towards laser dentistry

"Rocky and with small detours now and then"—the path towards laser dentistry (in Germany) can be described in those terms. Much like in implantology, the first impulses for this discipline derived from the daily practice and, another parallel to implantology, they were regarded with a sceptical eye and sometimes even criticised by universities. In spite of that, laser dentistry prevailed, mostly in the form of a renunciation of the "all-round laser", which can be applied universally in all fields of dentistry, and after defining lasers as an adjuvant, highly effective tool for

Fig. 3

Fig. 4

Fig. 1: A large audience presented at the two-day event on Munich's last Oktoberfest weekend.
Fig. 2: On Friday, 30 September, long-standing DGL members were awarded a certificate for their dedication, among them also Prof. Dr Norbert Gutknecht and Prof. Dr Mathias Frentzen.
Fig. 3: Parallel to the 25th anniversary congress, LASER START UP 2016 was held. Its scientific leader Dr Georg Bach opened the traditional education event on Friday.
Fig. 4: Dr Detlef Lutz and Dr Angela Wilke-Lutz were also among the awardees for long-standing membership.

special applications. The activities of RWTH Aachen University proved a special case of luck for the German laser users in dentistry, as Prof. Dr Gutknecht and Prof. Dr Angelika Lampert promoted scientific, evidence-based standards early on, thus providing credibility to the then-young discipline of laser dentistry.

These efforts were awarded with acceptance of the DGL by the DGZMK (German Society for Dental and Oral Medicine), which must be seen as one of the highlights of DGL's 25-year-old history.

The congress makers payed special tribute to this unique success story on the first congress day themed "From the origins of the DGL to new horizons".

DGL international

Almost 50 per cent of the speakers on this first congress day had travelled to Munich from abroad, which speaks for DGL's international attractiveness. As the DGL is among the world's oldest dental societies such as those in Japan and Brazil, the congress' list of speakers read like the Who is Who of international laser dentistry.

Dr Kenneth Luk from Hong Kong started the international contributions with his speech on the influence of different pulse durations on the microstructure of titanium implants. As is shown by the latest S3-Guideline "Periimplantitis" of the DGZMK and a number of implantological dental societies, the Er:YAG laser more and more forms the central part of laser applications in implantology.

The predominance of hard-tissue lasers (Er:YAG and Er,Cr:YSGG) in the scientific programme of the first congress day was noteworthy, with conservation forming the focal point of the contributions (Dr Riman Nasher, Sannaa, „Entfernung des Smearlayers mit dem Er,Cr:YSGG", Dr Ana Nogueira da Silva, Lissabon, „Composite auf laservorbereitete Zahnoberflächen" , Dr Berchem Kalender, „Präparation im Hartgewebe" and Dr Tamara Al. Karadaghi, Bagdad, „Dentinpermeabilität nach Laserbestrahlung").

Basic research

The influence of laser wavelengths which are able to remove dental hard tissue and bone tissue on implant surfaces was discussed controversially. A working group from Aachen, Germany, led by Prof. Dr Gutknecht and Dr Fahlstedt succeeded in arguing that Er;CR:YSGG laser light will not cause root surface changes even at an irradiation of 0.75 and 1 Watt. The second "hard tissue wavelength", the Er:YAG laser, was investigated by another working group led by Dr Luk, with an energy density of 10.6 J/cm^2 leading to irreparable damages of the implant surface.

A very active working group formed by DGL veteran Dr Michael Hopp (Berlin, Germany) attested that 445 nm diode lasers, Er:YAG lasers and CO_2 lasers played only a minor role in tissue damages following laser cutting, whereas Nd:YAG lasers and diode lasers of a wavelength of 810 and 980 nm caused pronounced damage zones with continued bleeding at the incision margins. Conclusion: healing included an (desirable) primary healing prompted by Er:YAG laser application as well as a defect healing caused by other laser types (which should be avoided).

News from the realm of wavelengths

Prof. Dr Matthias Frentzen (Bonn, Germany), who has been among Germany's most important members of the DGL, has been the society's general secretary for many years. He also has been doing research on the development short-pulse laser applications in dentistry, which is why he decided to contribute a concise overview to the congress speeches.

The audience proved receptive for Prof. Frentzen's main message: research and development of new ultrashort-pulsed lasers, which will replace the more complicated and less efficient excimer-lasers in the removal of dental hard and bone tissues, has been accelerated in such a way that soon high-performance and compact short-pulse laser sources will be available. The associated findings will have a positive influence on the further development of Er:YAG and CO_2 lasers.

Fig. 5

Fig. 6

Fig. 5: And the winner is … Eva Speck (DGL) and Sebastian Kiehne, Sales Manager Instruments at congress sponsor Dentsply Sirona, were happy to announce the winner of the SIROLaser Blue prize draw.
Fig. 6: The scientific congress was completed by an extensive industry exhibition.

Prof. Dr Andreas Braun (Marburg, Germany) has also been exploring new territory. He reported on the clinical application of the latest diode-laser wavelength. While until recently only diode lasers of a wavelength of 810–980 nm were available, a semiconductor laser of 445 nm has now been introduced to the market. This new diode laser wavelength from the blue spectre can promote the coupling of energy to pigmented tissue cells, thus ensuring a good surgical cutting at lower penetration depths and a reduced risk of damage to underlying tissues.

Dr René Franzen (Aachen, Germany) and colleagues introduced their research results on the 445 nm diode laser when applied endodontologically, attesting strong bactericidal properties to the blue wavelength in their in-vitro study.

Dr Ralf Borchers and Prof. Marcia Marques also dedicated their speeches to diode lasers, if under different circumstances. While Dr Borchers compared the effect of diode laser light when applied in cw and superpulse mode on soft tissues and noted significant advantages in the superpulsed diode lasers, Prof. Marques illustrated a special diode laser treatment: low-level laser therapy (low energy), which is mainly used to treat wound-healing disorders and pain.

The working group led by Prof. Dr Heinrich Wehrbein (Mainz, Germany) took up the cudgels for LLLT applications by noting a significantly reduced retention time and relapse rate after palatal expansion and LLLT application.

Parts of the first congress day as well as the complete second day were dedicated to indications of current laser dentistry. Let me say that much: it is simply incredible what has happened in this field during the last quarter of a century. The variety of laser-aided therapies is remarkable. In particular since those new forms of therapy are not just laser-aided applications in hard-tissue (tooth and bone) such as laser-aided endodontics and implantology (periimplantitis treatment).

The assiduous Aachen working group uses Er,Cr:YSGG laser to remove implants that cannot be saved. This approach is, according to the group, superior to conventional methods (Trepan) and guarantees best possible tissue protection. Although most of the scientific contributions at the 25th annual congress of the DGL concerned conventional approaches, there was a clear orientation towards new horizons: laser systems are being growingly employed in areas such as orthodontics (Dr Peter Kleemann, Luxembourg), oral and maxillo-facial surgery (Prof. Siegfried Jänicke, Osnabrück) and diagnostics (Dr Thorsten Kleinert, Berlin).

Dr Kleemann, a colleague from Luxembourg, presented laser-aided procedures in orthodontics with various wavelengths, thus showing a real cornucopia of laser applications with the suitable laser equipment.

Laser procedures in various specialized areas

If a certain procedure or technique, for example the dental laser, becomes an accepted dental discipline, it is inevitable that combination therapies are formed which will spread to other specialized areas. This phenomenon can be observed with laser dentistry. Hence, Prof. Frank Liebaug talked about the combination of laser and hyaluronic acid (he sees in this promising duet the chance to revolutionize periodontitis therapy). In addition, Dr. D. Moghtader presented his findings on laser-aided snoring therapy and went into questions of its legal legitimacy.

Looking back on the days spent in Berlin, one thing is certain: 25 years of DGL and a stimulating and multi-layered congress made travelling to the capital utterly worth it!_

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