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EAO 25th Annual Scientific Meeting Paris • 29 September–1 October, 2016



Interview

today international spoke with Prof. Daniel Wismeijer about problems that implantologists are still facing in using digital technologies and the future of computer-guided implant surgery. » **page 6**



Osstell symposium

Yesterday, experienced clinicians discussed how to address challenges in implant treatment using implant stability quotient (ISQ) technology. » **page 8**



Dental products in focus

The 25th annual scientific congress of the EAO will be an excellent opportunity to see the most up-to-date technologies and achievements in the field of dental implantology. » **page 24**



A feast for excellence in dental implantology

Anniversary meeting of the European Association for Osseointegration begins in Paris

■ The area around Porte Maillot in Paris in France saw more activity than usual on Thursday, when the 25th annual scientific meeting of the European Association for Osseointegration (EAO) began here yesterday morning at the Palais des Congrès de Paris. While the official congress programme commenced only after lunch, many attendees used the morning to visit the accompanying trade exhibition to learn about the latest innovations and solutions in the fields of osseointegration and implant dentistry.

Over 110 sponsors—the most ever in the relatively short history of the meeting—are exhibiting their latest products and services in Paris, including a number of industry heavyweights. MIS, for example, is showcasing its VCONCEPT, which was introduced at the company's third Global Conference in May as a comprehensive approach intended to provide clinicians with all the tools necessary for a successful and complete rehabilitation process. A new restorative concept is also being presented by Nobel Biocare with the On1. Ac-

cording to the company, the On1 Base connects to the implant at the time of surgery and remains in place throughout the healing process, the prosthetic work and the lifetime of the restoration. In this way, it brings the connection for restorative components to tissue level so that, unlike with conventional two-stage healing and temporary abutments for bone level implants, the biological seal created by the soft tissue remains undisturbed for optimised healing. The focus of ACTEON's presentation is the Implant Center 2 surgical unit, which

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gives clinicians access to both ultrasonic and rotating technologies for total independence in increasingly diverse clinical areas. At Straumann's booth, attendees are invited to

discover brand-new data on the SLActive surface that demonstrates incredible performance in the most challenging conditions, the company said.

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Around 3,500 dental professionals from all over the world are expected to attend the three-day meeting, which is being held in partnership with the Société-Française de Parodontologie et d'Implantologie Orale, the French society of periodontology and oral implantology. Boasting one of the largest memberships of a dental society in France, it will be presenting an overview of its objectives and history in a special session on Saturday morning.

Continuing its successful tradition of inviting a guest country from outside Europe, the EAO is holding today a special session organised with the Japanese Society of Oral Implantology. Chaired by Prof. Sato Hirobun from the Fukuoka Dental College and Dr Yataro Komiyama, the Director of the Brånemark Osseointegration Center in Tokyo, it will present the latest research from one of the most established markets for dental implantology in Asia and worldwide.

In addition, attendees will be able to learn about the latest clinical developments and processes at satellite industry symposia and hands-on sessions that will be held throughout today and tomorrow at the centre. New this year is the "7 minutes to convince" session that will feature a series of short films by researchers presenting a new approach or exceptional idea that might change the field of implant dentistry in the future, and attendees will be able to vote for the best one. More research

will also be presented during the oral communications sessions and at the poster area located on Level 2.

This year is the first time since 2004 that the EAO is holding its annual scientific congress in Paris. It follows two successful editions in Stockholm in 2015 and Rome in 2014. Among this year's speakers are over 100 of the world's leading experts in the field. Furthermore, 645 scientific abstracts were accepted for the meeting, an unprecedented number in the event's 25-year history.

For the latest information about the EAO congress in Paris, impressions, interviews and the latest product launches at the congress, please visit www.dental-tribune.com. As in the four previous years, Dental Trib-

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* Congress chairman Dr David Nisand

une International will be publishing two issues of its *today* show newspaper during the event in Paris. In addition, daily e-newsletters covering the most important news of the day will be sent to DTT's international audience. ◀

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Two breakthroughs in piezoelectric surgery

■ On the first day of the EAO congress, an expert panel discussed current research and benefits of piezoelectric surgery in implantology. In the fully packed symposium sponsored by ACTEON, Dr Angelo Trödhan began by presenting his clinical experience of expanding alveolar ridges with widths of only 1 mm using the Piezotome device. Dr Philippe Bousquet spoke about the new orthodontic bone stretching technique that permits conservation of infra-occluded ankylosed teeth or severely malpositioned implants. In an interview, *today international* spoke to both speakers about these new techniques in the field of piezoelectric surgery.

today international: Dr Trödhan, in your presentation, you introduced the flapless Piezotome-enhanced crest splitting and widening technique (FPeCSWT) for implant placement in the lateral atrophic alveolar crest. What were your major aims when developing the technique?

Dr Angelo Trödhan: Before piezoelectric surgical devices had been developed, there was no means of cutting bone without resulting bone loss and with ultimate precision. Instruments like oscillating saws and diamond-coated discs were extremely difficult to handle and a substantial amount of bone was lost in the cutting procedure owing to these instruments coarse means of working. Furthermore, the perfect geometry necessary for the task of vertical alveolar crest splitting was unachievable with these instruments and only very experienced maxillofacial and oral surgeons were able to perform this surgery with predictable



results. With these older instruments, crest splitting was limited to alveolar crest widths of greater than 3 mm. Since my research group explores new applications of piezoelectric surgery, we aimed to create piezoelectric devices that allow precise and easy use even for crests of only 1 mm in width in the hands of less experienced oral surgeons with the least trauma to the patient and the lowest risk of failure.

In your presentation, you stated that 70 per cent of your patients lacked adequate alveolar crest width. How does FPeCSWT help in this respect?

Dr Trödhan: For a sustainable dental implant in the molar region, an alveolar crest at least 6 mm wide is necessary to receive a 4 mm diameter implant. As an oral surgeon, one can choose to widen the alveolar crest by transplanting autologous bone blocks to the narrow crest, which is a very traumatic and challenging procedure and has the risk of failure in many cases. In contrast, with FPeCSWT one attains a very precise and simple bone

fracture that will heal like any other simple fracture of any bone in the body provided proper immobilisation can be achieved. Since FPeCSWT reproduces a simple fracture exactly and is auto-stabilised, the risk of failure is significantly lower than that of any other procedure. Furthermore, since it is minimally invasive, the patient does not have to endure any substantial post-surgical morbidity; it is just like a simple extraction of a tooth. Our research has shown that, even in the most difficult cases with crest widths of only 1 mm, the vertical bone loss after three years was a maximum of 1.5 mm and the overall implant loss rate was less than 3 per cent.

You mentioned that the Piezotome is the most suitable device for such pre-implantation surgical procedures. How does the use of the Piezotome for flapless vertical alveolar crest splitting compare with other devices?

Dr Trödhan: Simply by its unrivalled precision and ability to perform bone cuts without bone loss. Further-

more, it can be perfectly adapted for use according to the specific patient's situation and need. It is easy for the surgeon to learn to use, the protocol is precise and the surgeon does not have to tame stubborn rotating instruments, but can concentrate on the task at hand. When we started our research and development back in 2005, very little was known about the benefits of ultrasonic surgical tools in oral surgery and other areas of dentistry. Today, we have scientific proof of the Piezotome's significantly reduced post-surgical morbidity, superior soft-tissue preservation and enhanced bone healing.

Dr Bousquet, in your lecture, you discussed at length the orthodontic bone stretching (OBS) technique. This technique combines partial corticotomy and orthodontic treatment and results in expanded bone within eight to 12 weeks. Could you please explain the procedure?

Dr Philippe Bousquet: Extraction of ankylosed teeth does not resolve the under-development of the alveolar ridge resulting from lack of growth and can lead to a complex bony ridge defect that is a contra-indication to implant treatment. The lack of a high level of evidence for treatment options for ankylosed teeth encouraged us to develop this new technique, which has the advantage of moving the teeth into normal occlusion through orthodontic forces and deep corticotomies only. With the OBS technique, the osteotomy (deep corticotomy) is limited to either the buccal side or the palatal side (but not both) of the alveolar bone, unlike a repositioned dento-osseous block or an osteodistraction. Vascularisation is ensured by the palatal bone and the attached soft tissue. Surgical cuts are in the same axis in which the tooth moves, and the orthodontic device directs the movement in three dimensions.

Finally, the ankylosed tooth will fall in level owing to resorption, but we cannot predict when this will occur. In OBS, the ankylosed tooth is kept on the arch for an aesthetic result and the bone is stretched to improve future implant placement with vertical bone augmentation. This concept is different from osteodistraction. Indeed, in OBS, it is important not to wait for the formation of a callus in the area of the partial deep corticotomies. The applied forces are immediate and continuous, preventing healing in the area of the bone cuts and stretching the residual palatal bone. The use of a system to stabilise the block is not necessary, and the attached orthodontic device only induces and directs the movement along the de-



▲ Dr Angelo Trödhan



▲ Dr Philippe Bousquet

sired axis. A clinical study is underway to codify OBS treatment and evaluate the duration of treatment and tooth movement. The preliminary results have shown movement of 1-2 mm per month and that the relocations are stable after a period of two years.

What are the advantages of using piezoelectric surgery in general and the OBS technique in particular to perform corticotomies?

Dr Bousquet: This less traumatic technique facilitates the movement of ankylosed teeth towards the occlusal plane owing to several phenomena. The cortical section decreases the resistance of the bone surrounding the ankylosed teeth. Surgical wounding of the bone by the piezoelectric surgical device induces increased bone turnover and decreased bone density. This phenomenon promotes bone stretching and has been demonstrated with the use of the Piezotome 2. The tips used are the BS1S and PZ1 to cut the cortical bone and the PZ3 to cut into the cancellous bone, but preserving the opposite cortical bone.

Is the relocation of ankylosed teeth the only application of the OBS technique?

Dr Bousquet: We have now developed the technique for implant relocation and I think it is the first time that orthodontic treatment has been used for implant movements. We have used this technique to relocate implants in the incorrect position and to treat the effect of residual growth on implant position. The results are very promising and this technique has great potential for vertical bone augmentation.

Thank you both very much for the interview. ◀◀

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10.30 Digital Dentistry Selim Pamuk
12.30 Guided Surgery Mario Beretta
15.00 COMFOUR™ Mario Beretta

Saturday, October 1

10.30 Digital Dentistry Selim Pamuk
12.30 Product News Henry Schein

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Interview: “Dentists cannot blindly rely on the computer-guided approach”

Technologies such as cone beam computed tomography (CBCT), intra-oral scanners and CAD/CAM techniques have introduced a computer-guided workflow into dentistry, specifically implantology. While a computer-guided approach can make treatment more precise, safe and

predictable, it requires a practised, experienced and focused practitioner to implement a digital work-

flow. *today international* spoke with European Association for Osseointegration (EAO) congress presenter Dr

Daniel Wismeijer, Professor of Oral Implantology and Prosthodontics at the Academic Centre for Dentistry

Amsterdam in the Netherlands, about the problems that implantologists are still facing in using digital

“Dynamic navigation systems are the next step towards robotisation in implant dentistry.”

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technologies and the future of computer-guided implant surgery.

today international: Prof. Wismeijer, with the emergence of new digital technologies, novel treatment approaches have become available to dentists—particularly in the field of implant dentistry. While some implantologists embrace these new technologies, others are still sceptical of them. Why do you think that is?

Prof. Daniel Wismeijer: Novel technologies do not only affect implantology; they introduce digitisation into other areas of dental practice too. Consider the applications of intra-oral scanners and CEREC (Dentsply Sirona) machines and the use of new technologies in planning and designing customised implant superstructures. While some dentists use quite a lot of these tools, others do not use them at all and leave everything up to the dental technicians. This largely depends on the dentist and his or her attitude towards digital technologies and digitisation in general—be it at home or in the dental practice.

Then, of course, dentists have to invest in this sort of technology, as well as learn it and be prepared to unlearn their current practices. This too depends on the dentist: is he or she ready to use new technologies or would he or she prefer to stick with what he or she had learnt previously? On the one hand, we see many young dentists start working with these new technologies immediately and thereby become very experienced in new treatment approaches. On the other hand, dentists who are more experienced in established treatment protocols are, of course, less inclined to unlearn the old and start learning the new technologies.

In the “Emerging technologies: Head to head” session at the EAO congress, you will be talking about computer-guided implant surgery. What advantages does such surgery offer? Has it already proven itself in research and clinical practice, and what results can it achieve compared with free-hand surgery?

In my opinion, guided surgery helps dentists become increasingly precise in our work. Digital technologies are proving themselves in implant dentistry and I think that they are improving with time. If the practitioner can plan up front where he or she wants to place an implant and what sort of superstructure he or she wants to put on top of that, and if he or she can also place the implant in that exact position and implement a superstructure that fits precisely,

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However, we are not there yet. There are still certain problems we have to deal with, problems in precision, problems in combining all the tools needed for guided implant surgery and the limitations of these tools. For example, in order to plan the position of an implant and its superstructure exactly, we have to superimpose CBCT scans and intra-oral scans using software. Factors such as voxel size and the absence of clear landmarks by which to superimpose the different scans correctly can affect precision and cause deviations between the planned and the realised positions. I am not saying that free-hand surgery is more precise; however, the free-hand surgical approach may in some cases be more rewarding, as at least then the practitioner knows what he or she can expect



*Prof. Daniel Wismeijer will be presenting a paper titled "Hand-guided surgery versus guided surgery" on Friday, 30 September, during a session running from 3.30 p.m. to 5 p.m., in the Amphithéâtre Bleu at the Palais des Congrès de Paris.

"Digital technologies are proving themselves in implant dentistry and I think that they are improving with time."

and what his or her limitations are.

So what can dentists do to better implement a digital workflow in implant treatment?

Dentists have to know that they cannot blindly rely on the computer-guided approach. They still need to get their heads around the technology first and stay focused while using it. Moreover, they have to accept that there is a learning curve and that computer-guided surgery will not work 100 per cent the first time it is applied. In my lecture, I will be discussing the variables that influence the precision of the guided surgery workflow and what dentists are able to do to overcome associated problems. Primarily, they have to become comfortable with the different tools and software packages and gain experience in working with them. In the long run—and I think that we are not so far away from that now—computer-guided surgery is a treatment approach that will probably be much more precise than planning and placing implants without any guidance at all.

How will digital technology further change implant dentistry in the future?

One of the tools that I will be demonstrating during my presentation is a dynamic navigation system that provides real-time guidance based on the patient's CBCT scan. During surgery, the dentist sees the planned implant position on a screen while sensors track the drill and the patient's jaw and the system provides visual and tactile feedback to ensure that the dentist drills exactly at the planned osteotomy site. Dynamic navigation systems like this one are the next step towards robotisation in implant dentistry. From there, it will not take much to develop a computer-steered robot arm that calculates whether the drill is in line with the planning and, supervised and handled by the dentist, drills the osteotomy. In various surgical disciplines, for example neurosurgery, operations are already being performed using robotic technologies, as they are able to perform much more precisely than the human hand alone. It is only a matter of time until these technologies enter dentistry as well. ◀

Osstell symposium: Experts discuss benefits of ISQ diagnostics in daily practice

■ Today, dentists are facing increasing challenges in implant treatment: the continual development of digital technology, a growing number of high-risk patients associated with the pursuit of shorter treatment times, and achieving consistently predictable outcomes. At a scientific symposium, held by Swedish dental manufacturer Osstell as part of the 2016 EAO congress yesterday, experienced clinicians discussed how to address these challenges using implant stability quotient (ISQ) technology.

"The aim of our annual symposium is to provide an opportunity for dental professionals to learn about the use of ISQ diagnostics in everyday practice and to interactively discuss the topic with experienced clinicians," commented Osstell CEO Jonas Ehinger. "At this year's symposium, four well-known experts demonstrated how to monitor osseointegration in various treatment scenarios in order to optimise treatment time and implant loading and accomplish predictable results."

For more than 25 years, Osstell has been manufacturing instruments for analysing dental implant stability that help assess osseointegration through resonance frequency analysis (RFA). The method, developed by Prof. Neil Meredith from Australia and Prof. Peter Cawley from the UK, is currently the only objective and non-invasive means of measuring implant stability. Meredith, one of the speakers at yesterday's symposium, elaborated on the scientific concept of RFA, the development of ISQ technology over the last 25 years and the advantages of using ISQ measurement to enhance long-term clinical outcomes. "Osstell ISQ is the sixth generation of a 25-year-old instrument, and for me as the inventor, the evolution has been dramatic. It is one



*From left: Dr Marcus Dagnelid, Dr Jay Malmquist, Dr Jörg Neugebauer, Prof. Neil Meredith.

of the most sophisticated instruments in dentistry, and it is not only about the technology; it is also about the ability to use the data that gives us more and better information regarding the treatment and diagnosis of our patients," Meredith stated.

Dr Marcus Dagnelid from Sweden, who has been working with Osstell's technology for almost 13 years, moderated the symposium and explained how he implements the technique in the treatment planning of his cases, presenting examples of guided surgery and immediate loading in the case of single-implant treatment. "From the point when an implant is placed, the degree of micro-

mobility and the process of osseointegration can be monitored. This is especially important in the demanding clinical situations that we are facing today, as we are treating more difficult cases than in the past," Dagnelid said. Moreover, he showed how the online service Osstell Connect enables clinicians to connect several devices and share ISQ values between rooms, team members and dental professionals worldwide.

Oral and maxillofacial surgeon Dr Jay Malmquist from the US discussed how treatment protocols have changed with regard to implant loading. Presenting cases of immediate and early loading and grafting, he

highlighted the importance of primary stability in implant treatment and demonstrated how clinicians can use ISQ diagnostics to evaluate implant stability at each point of treatment. "Osstell's technology helps reassure the practitioner that an implant is secure for loading purposes, thereby enhancing predictability and treatment success," Malmquist stated.

"For patients undergoing a complex implant and prosthetic treatment, reducing treatment time and assuring a predictable outcome are still the most relevant factors," explained Dr Jörg Neugebauer from Germany. The implantologist and oral

surgeon presented cases of short and angulated placed implants and pointed out that grafting procedures are still necessary even with the use of these. Therefore, determining healing time after implant placement and loading time after second-stage surgery is essential for a safe treatment, he said. "With ISQ measurement, individual determination of the different healing periods is possible, which leads to an optimum treatment time and allows management of high-risk patients," Neugebauer explained.

EAO congress visitors who wish to learn more about ISQ can visit the company's booth S18 until Saturday. ◀

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