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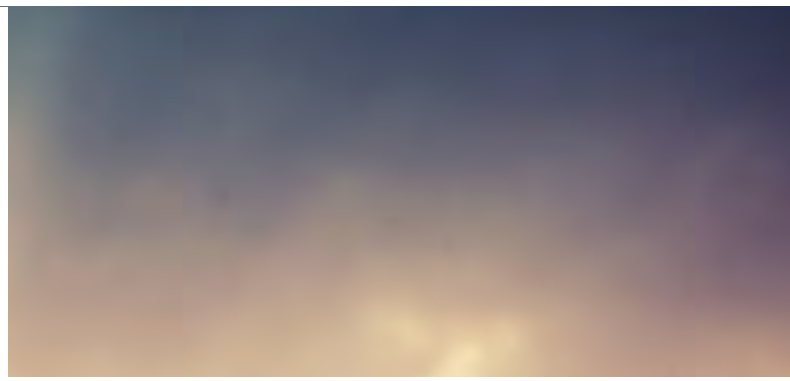
Issue 3/19

EDI Journal

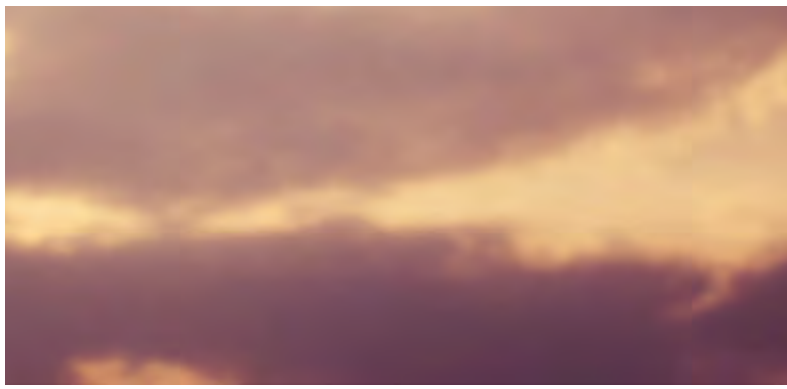
European Journal for Dental Implantologists



TOPIC

Rate your own work!

Quality Guidelines Implantology support implant clinicians



»EDI News: MDR – BDIZ EDI launches petition • 14th European Symposium 2020 in Skopje, Macedonia • Series: Female dentists in Europe »European Law: ECJ decision on fees for architects and engineers – no impact on health care sector yet »Clinical Science: Fabricating X-ray stents and drilling templates without "negatives" »Case Studies: Patient wishes vs. treatment options • Five-year clinical retrospective study of PEEK prostheses • Bone grafting with the sandwich technique

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No Implantology without Periodontology.
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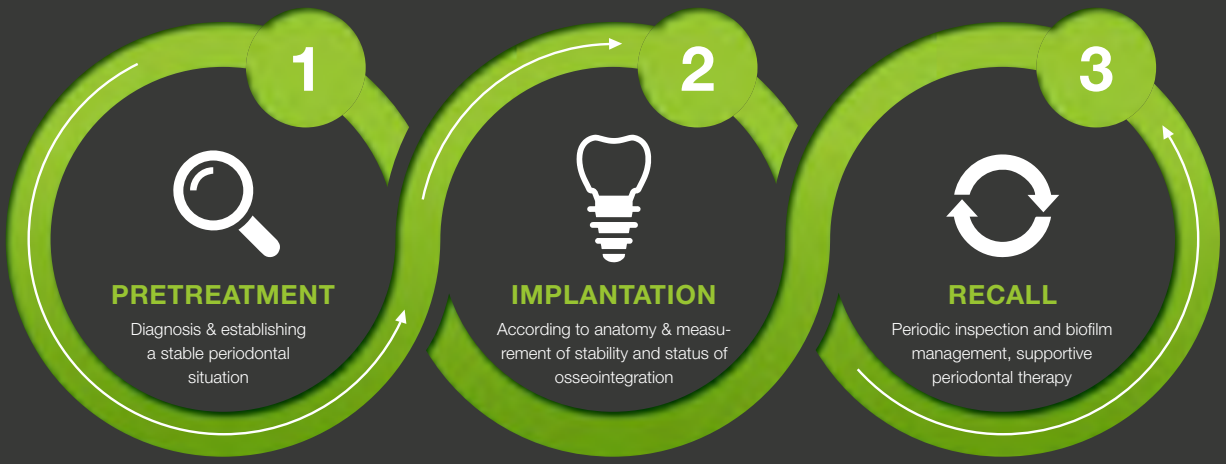
odontology is
thout Yang.



Broad base of support

Interest in the Europe-wide activities of BDIZ EDI is growing, bearing witness to the great importance its affiliated associations attribute not least to the European Committee and the European Consensus Conference. Currently at the top of the agenda is the European Medical Device Regulation (MDR). That we must get involved here is self-evident. We are all affected. Without exception. Manufacturers, dentists, patients. The MDR will have repercussions for the entire health care system and the economy at large, including dentists. Small and medium-sized manufacturers in particular feel overwhelmed by the new requirements.

The MDR aims to protect patients. There is no doubt that regulation is needed, and the MDR intends to ensure we get safer and better medical devices – not least in the light of the PIP silicone implant scandal in France a few years ago. But no regulation, however well-meaning, must be allowed to result in bottlenecks in medical and dental care. The MDR endangers the supply of innovative medical devices throughout Europe, according to the Association of German Chambers of Commerce and Industry. Its market survey suggests that 40 per cent of companies have withdrawn previously available medical products. And experts fear the MDR is acting as a brake on innovation and, even more ominously, will cause shortages of even essential medical devices. Germany, by far the largest producer of and the biggest market for medical device, is scrutinizing the effects of the MDR particularly closely.

The MDR has been in force since mid-2017, effectively immediately and directly. Important transition periods for manufacturers for the certification of their medical devices will expire in May 2020. Yet, so far only four (!) MDR-approved testing institutions, the so-called Notified Bodies, are operative in the entire European Union – and one of them is in the United Kingdom.

Recently, BDIZ EDI started a campaign to collect data from medical device manufacturers in the dental sector. It has called for an extension of the transitional period, in view of the bottlenecks at the Notified Bodies, and for "exercising a sense of proportion and realism regarding the exacting requirements for the (re)certification of medical devices". You can read more about the campaign in this issue.

Descending from the rarefied heights of European politics to everyday professional life, the current issue of the EDI Journal presents the Quality Guidelines for implant dentistry that were established to support dental clinicians in evaluating their own treatment results on an evaluation scale ranging from A+ to C.

But there is more to the Quality Guidelines than just quality ratings. Since it is not easy for dentists to evaluate their own work objectively, nor for patients to correctly assess the outcome of their treatment, the BDIZ EDI is providing guidance to assist implant dentists in evaluating the quality of their treatment. The Quality Guideline is intended for self-evaluation and self-assessment, since only the clinicians themselves are familiar with their own work and know their patients, their expectations and problems. And only the clinicians themselves can reliably evaluate how the prevailing framework conditions – which will influence any dental and medical treatment, sometimes decisively so – have affected the treatment resulted in question, either positively or negatively. But patients, too, need reliable and comprehensible criteria to evaluate treatment results. The Quality Guideline does not intend to prescribe or introduce standardized treatment processes or office structures. The dentist's profession is a liberal profession, and it will continue to be up to dental practitioners themselves how they achieve the required quality. That is the message!

In addition to these two major topics, this issue will keep you updated on clinical and scientific findings, and present case reports and much more. We want you to be well informed about health care politics. We hope the Guidelines will be a useful tool for your daily practice.

Anita Wuttke
Editor-in-Chief

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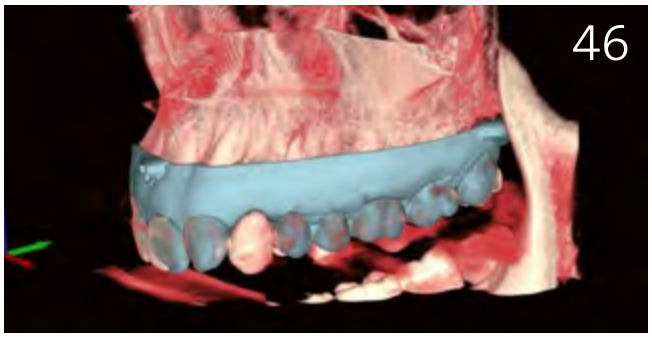
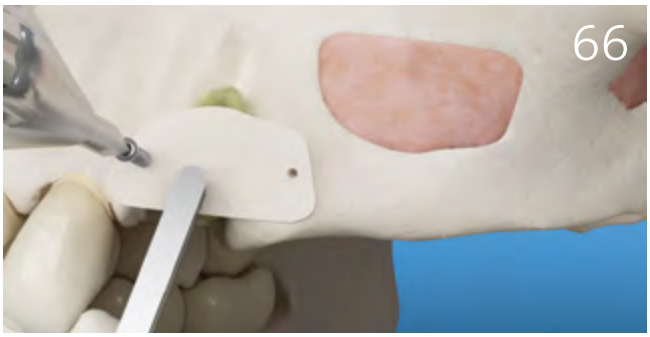


Fabricating X-ray stents and drilling templates without "negatives"



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Publisher Board Members: Christian Berger, Professor Joachim E. Zöller, Dr Detlef Hildebrand, Professor Thomas Ratajczak

Editor-in-Chief (responsible according to the press law): Anita Wuttke, phone: +49 89 72069-888, wuttke@bdizedi.org

Managing Editor: Isabel Lamberty, phone: +49 8243 9692-32, i.lamberty@teamwork-media.de

Advertising Management: My To, Siegristo GmbH, Postfach 751, CH-4132 Muttenz, phone +41 79 932 86 20, my@siegristo.com

Publisher: teamwork media GmbH, Hauptstr. 1, D-86925 Fuchstal, phone: +49 8243 9692-11, fax: +49 8243 9692-22, service@teamwork-media.de, www.teamwork-media.de

Managing Director: Uwe Gösling

Owner: Deutscher Ärzteverlag GmbH, Cologne (100 %)

Subscription: Katharina Schäferle, phone: +49 8243 9692-16, fax: +49 8243 9692-22, k.schaeferle@teamwork-media.de

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Partner Organizations of BDIZ EDI

Association of Dental Implantology UK (ADI UK)

ADI UK, founded in 1987, is a registered charity committed to improving the standards of implant dentistry by providing continuing education and ensuring scientific research. It is a membership-focused organization dedicated to providing the dental profession with continuing education, and the public with a greater understanding of the benefits of dental implant treatment. Membership of the ADI is open to the whole dental team and industry, and offers a wealth of benefits, education and support for anyone wishing to start out or develop further in the field of dental implantology.

Ogolnopolskie Stowarzyszenie Implantologii Stomatologicznej (OSIS EDI)

OSIS EDI, founded in 1992, is a university-based organization of Polish scientific implantological associations that joined forces to form OSIS. The mission of OSIS EDI is to increase implant patients' comfort and quality of life by promoting the state of the art and high standards of treatment among dental professionals. OSIS EDI offers a postgraduate education in dental implantology leading to receiving a Certificate of Skills (Certyfikat Umiejętności OSIS), which over 130 dental implantologists have already been awarded.

Sociedad Espanola de Implantes (SEI)

SEI is the oldest society for oral implantology in Europe. The pioneer work started in 1959 with great expectations. The concept of the founding fathers had been a bold one at the time, although a preliminary form of implantology had existed both in Spain and Italy for some time. Today, what was started by those visionaries has become a centrepiece of dentistry in Spain. SEI is the society of reference for all those who practice implantology in Spain and has been throughout the 50 years, during which the practice has been promoted and defended whereas many other societies had jumped on the bandwagon. In 2009 SEI celebrated its 50th anniversary and the board is still emphasizing the importance of cooperating with other recognized and renowned professional societies and associations throughout Europe.

Sociedade Portuguesa de Cirurgia Oral (SPCO)

The SPCO's first international activity was the foundation – together with their counterparts in France, Italy, Spain and Germany – of the European Federation of Oral Surgery (EFOOS) in 1999. The Sociedade Portuguesa de Cirurgia Oral's primary objective is the promotion of medical knowledge in the field of oral surgery and the training of its members.

Udruženje Stomatologa Implantologa Srbije-EDI (USSI EDI)

USSI EDI was founded in 2010 with the desire to enhance dentists' knowledge of dental implants, as well as to provide the highest quality of continuing education in dentistry. The most important aims of the organization are to make postgraduate studies meeting the standards of the European Union available to dentists from Serbia and the region; to raise the level of education in the field of oral implantology; to develop forensic practice in implantology; and to cooperate with countries in the region striving to achieve similar goals.

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Ursula von der Leyen, President-designate of the EU Commission

Europe's most powerful woman has a puzzle to solve

This woman had not been on anybody's radar. Ursula von der Leyen landed her surprise coup as the leading candidates of the major parties in the Parliament, Manfred Weber (Conservatives, Germany), Frans Timmermans (Social Democrats, Netherlands) Margarethe Vestager (Liberals, Denmark) fought for every little advantage as potential successors of Jean-Claude Juncker. Von der Leyen had not even run for the office of Commission President – but she was still made to take home the prize in the end. She will be the first woman in the top office of the European Commission.

Right at from her very start, *von der Leyen* seemed to make promises that appeared, well, a mite ambitious. In her campaign speech, she had told the EU Parliament: "I will make sure that my EU Commission is made up of equal numbers of men and women." After all, half of the European population is female. But as things stand, her demand will remain unfulfilled, with many member states ignoring her call. As of the time of this writing, 9 women and 13 men from their countries have been nominated, although the decisions by some states, including France, Belgium and Italy, were still pending.

By the time *von der Leyen*'s is scheduled to take office on 1 November, she would therefore have to have "collected" 13 women and 13 men for her Commission. Each of the 28 member states nominates one candidate for the EU Commission. What is going on at this point is is a kind of speed dating with the nominees.






Ursula von der Leyen

Photo: European Union 2019 - Source : EP

Ursula von der Leyen from Hannover has been a member of the conservative Christian Democratic Party (CDU) in Germany since 1990. She is the daughter of Ernst Albrecht, a well-known former premier of the state of Lower Saxony, but only entered politics comparatively late, at the age of 43. In 2013 she became Minister of Defence; in July 2019 she was elected President of the EU Commission. Von der Leyen is a licensed physician with a medical degree and has worked as an assistant physician in Hannover. A mother of seven, she has had an amazing political career. From 2005 to 2009, she was Minister of Family Affairs; from 2009 to 2013, she was Minister of Labour and Social Affairs in Chancellor Angela Merkel's cabinet. In 2013, she was appointed Minister of Defence, the first woman in Germany to fill this post, which she resigned from in mid-July to prepare for her future role at the head of the EU Commission.

While countries such as Sweden, Finland and Denmark are sending women into the race, as expected – for Denmark, former EU presidential candidate *Margarethe Vestager* would have to be regarded as a self-evident choice – while other countries such as Poland, Greece and Austria merrily flout the President-Designate's wishes. Poland is even withdrawing *Elżbieta Bieńkowska*, the previous Commissioner for the EU Internal Market Commissioner, and nominating a man in her place. Austria and Ireland want to hold on to their previous Commissioners *Johannes Hahn* (Enlargement) and *Phil Hogan* (Agriculture). Slovakia, Hungary and Slovenia have also nominated men.

Governments had until 26 August to nominate their candidates. Negotiations are currently underway, with observers comparing the proceedings to a speed-dating event. Not until the slate of nominees is complete can *von der Leyen* begin to assign portfolios. It recently became known that her predecessor *Jean-Claude Juncker* had rejected six nominees in 2014 when he took office. Starting on 23 September, the candidates selected by the future head of the EU Commission will be heard before the EU Parliament. Parliament has to confirm them – and that cannot be taken for granted in all cases. For example, the confirmation of *Krzysztof Szczerski*, a former Polish head of cabinet, is considered a doubtful case because he was nominated by the governing national conservatives (PiS), which have so far been ostracized by the pro-European factions.

Which nominee with what qualifications can be slotted into which portfolio will be a difficult puzzle to solve. France has apparently expressed an interest in economic issues such as trade and industry as well as in climate protection. Women have been nominated in both areas. The EU Parliament's vote on the entire slate is expected to take place in mid or late October.

The former Spitzenkandidaten (top candidates) *Frans Timmermans* and *Margarethe Vestager* are regarded as seeded. *Timmermans*' name has been circulated for first vice president. *Vestager*, the former Commissioner for Competition, will presumably head an expanded economic portfolio. The name of *Manfred Weber* of the conservative EPP, on the other hand, is hardly heard any more these days. He has fallen deep below the radar: from being Spitzenkandidat of the conservatives, supported by German Chancellor *Angela Merkel*, he had to make room for a political heavyweight – *Ursula von der Leyen*. But the real dilemma of the friendly Christian Social Union member from provincial Lower Bavaria was that hardly anyone knew his face even in Germany.

AWU






Save the date: Cologne, 23 February 2020

15th Expert Symposium: Update on peri-implantitis

For the 15th time now, BDIZ EDI invites participants to attend its Expert Symposium in Cologne, with peri-implantitis in focus. After 2008 and 2015, the Guidelines on peri-implantitis will again be updated in 2020. If you are interested, you should make a note of the date: Sunday, 23 February 2020 – once again in Cologne, at the Dorint Hotel on Heumarkt. The one-day CPD event traditionally takes place on Carnival Sunday.

The Expert Symposium, chaired by *Professor Joachim E. Zöller*, will focus on how all potential causes of peri-implantitis can be identified and eliminated. The treatment outcome is considered less predictable in peri-implantitis than in peri-odontal disease. "Currently, the goal is to reduce the signs and symptoms of inflammation and to avoid progression", as the 2015 Guidelines commented on the prospects for success.

The day before, the European Consensus Conference (EuCC) under the auspices of EDI BDIZ will review and substantially update the 2015 Guidelines

BDIZ EDI President Christian Berger (left) and Professor Joachim E. Zöller.

The Expert Symposium traditionally takes place on Carnival Sunday.

and of course include any new treatment-related developments. What has changed since then? What challenges await practitioners? What new treatment methods appear promising?

The 2015 consensus paper (the Guidelines) included early or late biological complications; they are observed as early or late complications and require diagnostic and therapeutic experience on the part of the treatment provider if a progression of the pathological processes is to be prevented.

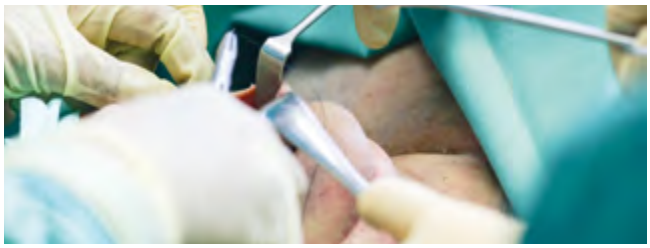
Continuing professional development – and Carnival in Cologne

In 2020, BDIZ EDI will proudly present its 15th Expert Symposium. The event, originally initiated and still chaired by *Professor Zöller*, traditionally takes place in Cologne on the last weekend of Carnival. The motto on Heumarkt ("hay market"), in the middle of the city, will be: "CPD during the day – Carnival at night". The concluding session of the "Die Grosse von 1823" Cologne Carnival Celebrations Committee – the oldest in that city – will once again welcome the 200 dentists headed by President *Christian Berger*.

More information
www. bdizedi.org/veranstaltungen

Save the date!

14th BDIZ EDI Expert Symposium Cologne
Sunday, 23 February 2020 Topic:
Update on peri-implantitis



Impressions from Expert Symposia of past years.

New version of the BDIZ EDI Quality Guideline for Implantology

Providing guidance for assessing one's own work

It is not easy for dentists to evaluate their own work objectively, nor for patients to correctly assess the outcome of their treatment. The BDIZ EDI has revised its Implantology Quality Guideline to assist implant dentists in evaluating the quality of their treatment.

The aim of the Quality Guideline – initially presented in June 2002, revised in 2006 and now once again updated – is to help practitioners examine and judge the quality of their own work. The Quality Guideline is intended for self-evaluation and self-assessment, since only the clinicians themselves are familiar with their own work and know their patients, their expectations and problems.

And only the clinicians themselves can reliably evaluate how the prevailing framework conditions – which will influence any dental and medical treatment, sometimes decisively so – have affected the treatment resulted in question, either positively or negatively. But patients, too, need reliable and comprehensible criteria to evaluate treatment results. The criteria defined in the Quality Guideline are based on the achievements of dental science, and the factual statements of the Quality Guideline will therefore be equally valid regardless of the country where they are applied.

Back in the year 2002, the Quality Guideline was a first attempt to highlight the issue of quality in oral implantology in Germany. It was revised and updated in 2006 and now in 2019, and it needs to continue to be updated as knowledge in dentistry continues to grow. Techniques, materials and treatment concepts are changing accordingly.

As BDIZ EDI *President Christian Berger* explained: "The Quality Guideline does not intend to prescribe or introduce standardized treatment processes or office structures. The dentist's profession is a liberal profession, and it will continue to be up to dental practitioners themselves how they achieve the required quality."

Ordering the Quality Guideline

The printed version (A4, 20 pages) can be ordered at the price of € 2.50 (including VAT, excluding shipping). Please send your request via e-mail to: office-munich@bdizedi.org

Bundesverband der implantologisch tätigen Zahnärzte in Europa

European Association of Dental Implantologists

BDIZ EDI Quality Guideline for Implantology

March 2019

For many years now, dental academics and practitioners have been thinking about quality guidelines. Early in this process, BDIZ EDI considered it his responsibility to develop a quality guideline for implantology by consensual cooperation with academics and practitioners. More than 25 years ago, the Quality and Registry Committee of BDIZ EDI formulated initial standards for implant systems. The BDIZ EDI manual on the Implant Registry and on the Registry for Regenerative Materials has appeared in numerous editions. The establishment and development of an extensive network of competent dental experts has for many years been as important a contribution towards quality assurance as the introduction of quality management systems in dental offices and clinics. The White Book on Implantology, which appeared in 2000, described all dentist-related aspects of quality in implantology. However, long-term trends show that a qualitative evaluation of dental services is a difficult endeavour that has given rise and will continue to give rise to much controversy and discussions.

The objective of our Quality Guideline, which first appeared in June 2002 and is pre-sented here in an updated version, is to offer dentists active in the field of implantology and, wherever possible, also patients a system of yardsticks against which to evaluate the work. The Quality Guideline is also intended for self-evaluation and self-assessment, since only the treatments providers themselves know the baseline situation, their own work and their patients with all their expectations and problems. Dentists and patients can evaluate how the prevailing conditions – which will influence any medical treatment, sometimes decisively so – have affected the treatment result in question, either positively or negatively. Patients, too, need reliable and comprehensible criteria to evaluate treatment results.

It should be noted that the criteria defined in this Quality Guideline are based on the re-quirements of dental science and are therefore valid only in a political and scientific environment in which these requirements are not disregarded, as is unfortunately the case within the German statutory health insurance system and increasingly also within German private health insurance. The factual statements within this Quality Guideline will therefore be equally valid in countries outside Germany. On the other hand, these Guidelines cannot be transplanted to healthcare systems in which the application of the results of dental science is restricted by governmental or non-governmental institutions, thus affecting the dentist–patient relationship. Attempts to do so would lead to incorrect conclusions and results.

In 2002, the Quality Guideline was a first attempt to describe the meaning of quality in implantology in Germany. The Guideline has been consistently modified and updated and will continue to require continuous modification.

The term “dentist” includes oral and maxillofacial surgeons, who in Germany invariably have a dual licence to practice, both as physicians and as dentists.

The present version of this Quality Guideline was approved by the Board of Directors of BDIZ EDI in March 2019.

BDIZ EDI
Mühlenstr. 18
D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
office@bdizedi.org
www.bdizedi.org

Keeping guidelines up to date
In a field like dentistry, characterized by rapid development and continuous change, guidelines, once defined, will never be definitive and will never be able to assure quality for all time to come. In a way, guidelines are only snapshots that must be periodically examined for continued validity and updated as needed. Guidelines are dynamic and practical models for optimization that can be employed by any dentist. The principles in the introductory sections for the individual quality evaluation criteria are an integral part of this Quality Guideline. They are a prerequisite for being able to employ the tables with evaluation criteria at the end of this Quality Guideline, not least because they contain important hints and supplementary information.
Guidelines not only influence practical activities and training, but they will also affect university education and continuing education. The Quality Guideline for Implantology was first published in 2002. The present version was updated in March 2019.

Objective
One of the objectives of the Quality Guideline for Implantology is to provide a tool for dentists to assist their individual position about various activities and treatments. There will probably never be any dentists who are able to call themselves “A+” dentists regarding their entire range of professional activities pursuant to this Quality Guideline. All dentists are better at some tasks and less good at others, moving daily within a broad range of assessment levels. This means, however, that dentists must have both the opportunity and the ability to identify the areas where they need to deepen or update their knowledge or skills. At a time in which new products and techniques keep flooding the market, it is almost impossible for individual dentists to stay abreast of developments in every area of dentistry that they practice. The present Quality Guideline permits all dentists to identify their relative positions and to improve where necessary and appropri-ate.

Implementation
The implementation of this Quality Guideline requires new ways of thinking on the part of many dentists. This rethinking process will reward all those who are honestly interested not only in providing “services” to their patients/customers but in offering them individually optimized dental treatment. It is by conscious choice that the Quality Guideline generally disregards structural and process quality in implantological treatment. Structural and process quality have been sufficiently defined in BDIZ EDI’s White Book on Implantology and many quality management systems available on the market. The Quality Guideline does not intend to prescribe or introduce standardized treatment processes or office structures. The dentist’s profession is a liberal profession, and it will continue to be up to dental practitioners themselves *how* they achieve the required quality. It is their responsibility *that* it is. Their patients will appreciate it.

Fundamentals

Oral implantology defined
Oral implantology is concerned with the insertion of and the provision of superstructures for implants (= fixtures, “artificial roots”) in the jawbones of partially or completely edentulous patients. Implants are also used for stabilizing and fixating epitheses. The choice of implant system, implant locations and number of implants must be appropriate to the baseline situation and the planned restorative treatment. Implant and superstructure are meant to help restore mastication, swallowing and speech functions and to improve aes-thetics. Oral implantology is and will continue to be in a steady flux so.

BDIZ EDI
Mühlenstr. 18
D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
office@bdizedi.org
www.bdizedi.org

Quality assurance in oral implantology

Since finding recognition in scientific circles, based on the biological concept of osseointegration, oral implantology has become an important part of current-day dentistry, which must now be taken into consideration whenever a treatment plan is established for the oral rehabilitation of partially or completely edentulous patients. Implant therapy can be subdivided into implant surgery and implant prosthetics. The surgical aspect has to consider the principles of oral and periodontal surgery, while the restorative aspect has to consider the principles of hybrid and crown and bridge restorations. It is advisable – by analogy with the SAC classification proposed by Sailer and Pajarola (1996) – to divide implant cases into simple, advanced and complex cases.

«SAC»criteria (Sailer and Pajarola, Atlas Orale Chirurgie):

- S = Simple case. Surgery without anatomical risks or major technical challenges. Low complication rate. May be performed on an outpatient basis by well-trained general dentists.
- A = Advanced case. Surgery with anatomical risks, some technical challenges. Complications must be anticipated. May be performed on an outpatient basis by dentists with surgical training.
- C= Complex case. Difficult procedure, considerable surgical difficulties, major proce-dure. Complications must be anticipated. May be performed by experienced dentists with surgical training or by maxillary surgeons.

With increasing levels of difficulty, collaboration and teamwork between all actors in-volved in the surgical and restorative procedures become increasingly important. Teamwork requires a trustful and close cooperation aimed at optimizing treatment success, regardless of whether the entire treatment is performed by a single dentist or by several dentists/dental offices cooperating. The theoretical basics of oral implantology should be taught at universities as an integral part of a course of dental studies. Practical training, by contrast, will be obtained within the framework of continuing education.
The following aspects should be noted:

- For the surgical and restorative aspects of the treatment, postgraduate training in oral surgery or periodontology and prosthetics with a clinic or a specialist is recommended.
- In addition, special training for the implant system to be used and continuing spe-cific education for the field are an advantage.

This Quality Guideline was drafted by analogy with the Guidelines for Quality Assurance first laid down in 1996/7 by the Expert Commission of the Swiss Society for Oral Implantology (Schweizerische Gesellschaft für orale Implantologie, SGI) and has been updated according to the revised version of the Swiss Dental Association (Schweizerische Zahnärzte-Gesellschaft, SSO) dated 2014. It is also based on the Guidelines issued annually or updated by the European Consensus Conference (EuCC) under the auspices of the BDIZ EDI since 2006 (available at www.bdizedi.org > English > European Consensus Conference).
The authors principally approve of the formulation of guidelines according to the system proposed by the American Association of Oral and Maxillofacial Surgeons (AAOMS): Parameters of Care for Oral and Maxillofacial Surgery 1995.

BDIZ EDI
Mühlenstr. 18
D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
office@bdizedi.org
www.bdizedi.org

Principles for the development of guidelines

- Evidence-based medicine
- Dentists as specialists, dentists' medical responsibility
- Consideration of effects on the healthcare system
- Independence of professional politics and remuneration issue

Fundamental aspects of evaluation criteria
Measures for quality insurance can be defined by reference to structures, processes or results. Structure and process quality are primarily determined by the person in charge of running the dental office, while result quality is defined by factual and professional guide-lines that are determined by the current state of the art.

*The **standardization** of distinct levels of treatment quality ("Guidelines A to C") is not suitable for medical treatments. Rather, recommendations regarding risk factors, informing patients of treatment objectives and criteria for evaluating results may contribute to assuring the desired quality. The present recommendations therefore primarily address results-related quality assurance.*

Evaluation criteria
Defining three levels of **quality** within the framework of this Quality Guideline makes eminent sense. On one hand, the quality that can generally be achieved is covered by evaluation category A, "Good result, appropriate to aspire to in normal cases". By definition, it denotes the result that can be achieved under normal conditions. On the other hand, discussions have consistently shown that dentists are not always satisfied with "good" results but would like to include the best conceivable treatment results in their reflections. This is why there is an additional evaluation category A+. This is not the individual optimum for each patient, but the maximum that can be achieved with the means presently at our disposal. This may require a great amount of time and effort. Category A+, then, is not subject to any restrictions regarding the time and effort expended. If the negative evaluation matrix defines category B as "Deficient, potentially harmful" or category C as "Unacceptable, alternatives required", potentially necessary measures may be listed

It should be noted that the circumstances of the individual case will have to be consid-ered when evaluating a treatment. For example, a good result may not be achievable in a patient with extreme gagging reflexes, even though the individual optimum may have been attained.

Generally, it should be noted that treatment results that must be classified as category B should be revised only if there is a risk of damage and it is the patient's express wish to redo the respective restoration. In making these decisions, the risk of preserving the current state must be weighed against the risk accompanying every medical intervention, including revisions, improvements and re-treatment. If a result that is not in category A is left unrevised for a cogent reason, this fact will have to be documented in the medical history. In other words: A category B result does not necessarily require revision unless it is potentially harmful. For example, older crowns with less-than-perfect margins that have been worn by the patient for many years without any damage to the tissues are not an unconditional indication for a remake. Nevertheless, classifying this result as a category B result is still appropriate, as it must be ensured that the treatment result does not deteriorate and become a category C result. Recognizing this boundary is the key to discriminating between categories B and C. Category C unconditionally calls for action. Only dentists who have internalized the differences between the categories can give their patients the right treatment at the right time.

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Mühlenstr. 18
D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
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It should be noted for all these categorizations that the time and effort required for restoration or therapy must be reasonable, i.e., that all dental treatment must be based on a reasonable relationship between the effort expended and the patients' individual expectations, which may vary greatly from patient to patient.

Evaluation categories

A+ Excellent result with no reservations whatsoever
Treatment result or status achieved by an excellent treatment standard where neither the time available for treatment nor the patient's special wishes nor any financial considerations dictate any restrictions.

Category A+ denotes an excellent treatment result from the point of view of implant surgery and implant prosthetics. The treatment (procedure, modalities, result) and the restoration (design, technical implementation) meet the most exalted demands. The patient is unconditionally satisfied. No objective factors were found that might result in any negative biological consequences for the oral tissues. No intraoral intervention or modification of implants or superstructures is required once the treatment has been concluded. The result exceeds the treatment goals jointly defined with the patient at the outset of the treatment.

A Good result, appropriate to aspire to in normal cases
Treatment result or status achieved by a minimally acceptable treatment standard where there is little risk of any negative influence on the patient.

Category A denotes a good treatment result from the point of view of implant surgery and implant prosthetics. This is the category within this Quality Guideline that dentists should normally aspire to. Specifically, there are no significant objective deficiencies that would constitute a threat to the patient's **health** (systemic or local).

Important: The evaluation of the treatment result **must** consider the following parameters:
- The patient's original needs and expectations
- The baseline situation
- Comprehensive and topical consultations/patient education by the treatment provider at baseline, or the absence thereof
- Conditions under which the treatment took place
- Time since the insertion of the restoration etc.

At the same time, when evaluating the treatment result, allowance is made only for those limiting factors that the dentist could not influence. If the conditions prevailing during planning, implementation and postoperative care were **optimal** with regard to time, technical and financial considerations, etc., available as **satisfactory** result must be expected.

B Deficient, potentially harmful
Treatment result or status based on measures, or the absence of measures, that carry a risk of – albeit reversible – harm to the patient.

Category B defines a deficient treatment result from the point of view of implant surgery and implant prosthetics. This may have been caused by non-treatment or incomplete treatment – possibly consciously or with the patient's consent– or by treatment errors or a level of postoperative care that does not meet professional standards. The result **can** be revised if the patient desires this. In the presence of **potentially harmful** elements that constitute a

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Mühlenstr. 18
D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
office@bdizedi.org
www.bdizedi.org

threat to the patient's **health** (systemic or local), the result should be revised by mutual agreement with the patient. Here, too, when evaluating the treatment result, allowance is made only for those parameters listed under category A and specific limiting factors that the dentist could not influence.

C Unacceptable, alternatives required

Treatment result or status based on measures, or the absence of measures, that have already caused irreversible harm to the patient's masticatory organ or where such harm had already previously existed.
Category C objectivizes a clearly insufficient treatment result from the point of view of implant surgery and implant prosthetics that mandates a revision or an alternative treatment. It is a direct result of non-treatment or incomplete or incorrect treatment, or negligent postoperative care. It is anticipated that the restoration will cause – or the restoration has caused – irreversible **problems of oral health**. A revision or alternative restoration is inevitable.

As concerns patient compliance, it should be noted that this factor and its evaluation can influence the overall treatment results and its assessment.

Quality criteria for implantological treatment measures

List of topics

1. Medical history
2. Examination
3. Treatment planning
4. Patient education
5. Concomitant prevention
6. Implant surgery and implant prosthetics

Five evaluation criteria are discussed and requirements are listed for each of the above groups. The proposed treatment measures and evaluation factors are recommendations, which if followed may yield a result that is satisfactory to the patient and the treatment provider.

7. Indications
8. Concomitant prevention objectives
9. Risk factors
10. Standards for treatment measures
11. Indicators for evaluating results

1 Medical history

1.1 Indication

Each patient's medical history must be documented and kept up to date throughout the course of the treatment. A distinction is made between the general medical history and the specific medical history.

The specific medical history provides information about the development and progression of an acute disease or about the efficacy of treatment.

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D-51143 Köln
GERMANY

Fon: +49-2203-80 09 339
Fax: +49-2203-91 68 822
office@bdizedi.org
www.bdizedi.org

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CED on the EU Medical Devices Regulation

Will bottlenecks threaten our supply of medical devices?

The Council of European Dentists (CED) has defined its stance on the implementation of the EU Medical Devices Regulation (MDR) in a position paper. The CED has also issued a warning that certain medical drugs may not be available in time. At its spring plenary meeting on 24 and 25 May 2019 in Vienna, the CED unanimously adopted a position paper on the MDR, which takes effect on 26 May 2020. According to the document, the two main concerns are the implementation of new classification rules for all medical devices and the availability and capacities of Notified Bodies. These Notified Bodies are state-appointed and state-supervised private inspection bodies.

CED believes supply bottlenecks are possible

"Possible delays in developing both areas have caused deep concerns amongst the profession about the readiness of the system for May 2020, and the continued availability and timely accreditation of medical devices and therefore, optimal patient treatment options", the CED states. "Uncertainties over the interpretation of the MDR provisions could result in shortages of medical devices currently used by health professionals on a daily basis. Some devices might not be available on the market after May 2020 if their classification or accreditation is delayed. This would be a major issue for the provision of health services across the European Union."

European dentists call on EU to act

In order to complete the implementation of the Regulation within one year, the CED calls upon the European Commission and member states to provide detailed guidance on the classification rules and to ensure that the necessary systems are operational. The new Notified Bodies must be appropriately staffed to take up their work by early autumn this year.

The CED furthermore calls for full transparency of information on the safety of medical devices and for public access to the European Medical Devices Database (EUDAMED). In order to ensure the trust and confidence of the public in the way medical devices are regulated, all reports confirming safety should be, in so far as is practicable, publicly accessible.

Source: CED

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EU Medical Devices Regulation (MDR): BDIZ EDI launches petition

BDIZ EDI calls for an extension of the transitional periods

The EU Medical Devices Regulation (MDR) affects all of us: manufacturers, physicians, dentists, dental technicians, clinics, universities and patients. The MDR has been in force since mid-2017 and is immediately and directly effective. Important transition periods for the certification of medical devices for manufacturers will expire in May 2020. So far, however, there are only two MDR-approved testing institutions (Notified Bodies) in the EU. The European Association of Dental Implantologists (BDIZ EDI) is calling on the German government to urge the EU Commission to extend the transitional periods in view of the bottlenecks at the Notified Bodies and to exercise a sense of proportion and realism regarding the exacting requirements for (re)certification of medical devices. Otherwise, bottlenecks will hamper innovative product design and marketing – to the ultimate detriment of the patients.

In general, the BDIZ EDI welcomes the EU's efforts to increase product safety for consumers and patients. At the same time, market observers and relevant associations have found that the MDR is not feasible to implement. The regulatory requirements for recertification cannot currently be met. In addition, there is a dramatic shortage of Notified Bodies, which themselves have to undergo a certification process. So far, all attempts to get the EU Commission to extend the deadline have fallen on deaf ears.

MDR workshops for the dental industry

The BDIZ EDI offers special workshops on how to approach the EU Medical Devices Regulations. The presenter will be Professor Thomas Ratajczak, solicitor and legal adviser of the BDIZ EDI and the author of the series "EU Medical Devices Regulation (MDR)". Workshops are bookable by appointment via the Munich office of the BDIZ EDI: office-munich@bdizedi.org, +49 89 72069888

MDR survey

The BDIZ EDI has commissioned the law firm of Ratajczak and Partners in Sindelfingen to conduct an anonymous survey among dental manufacturers. The aim is to find out what influence the EU Medical Devices Regulation (MDR) has on individual companies and what consequences are likely to be. The aim is to sensitize (and, ideally, mobilize) political decision-makers at the federal and EU levels for this topic.

Almost all products in the dental office are affected
Substantial innovations include the introduction of a consultation process for clinical evaluation (scrutiny mechanism) for active products of risk class IIb that supply or withdraw medicinal substances to or from the body, and implants of class III (Article 55 of the MDR), as well as an upward reclassification of software, material medical devices and reusable invasive surgical instruments. Requirements of quality management systems (QMS) and technical documentation have also become more stringent.

"I can say already now that some parts of the MDR must been cobbled together rather hastily. The new Eudamed database system cannot be expected to be operative by 26 May 2020, nor is it likely that the UDI will be working by then. And right now it is still entirely unclear how many Notified Bodies will be operative at all by 26 May 2020."

Professor Thomas Ratajczak
BDIZ EDI legal adviser

"Added product safety comes at a price. The higher the regulatory hurdles, the more costly the certification process, and the greater the delays before an innovative product reaches the patient. Unfortunately, this interdependence is often overlooked in the public debate."

Professor Ulrich M. Gassner, Founding Director of the Research Center for Medical Device Law (Forschungsstelle für Medizinprodukterecht, FMPR) at the University of Augsburg

The BDIZ EDI has put the topic of MDR on the agenda because there is hardly any product used in a dental practice that is not a medical device in the sense of Article 1 para. 4 of the MDR. To underpin its demands on politicians, the German federal government and the EU Commission, the association has announced an anonymized survey of dental manufacturers, to be conducted by the Ratajczak & Partners law firm. At the same time, the BDIZ EDI will launch a petition. *AWU*

Professor Thomas Ratajczak

Professor Ulrich M. Gassner

Petition concerning the MDR

EU Medical Devices Regulation – but not like that

The BDIZ EDI is currently launching, initially on the federal level, a petition aimed at persuading parliaments in Germany and in Europe to take up and critically scrutinize the issue of the MDR:

EU Medical Devices Regulation – but not like that

All practices and all market participants are called upon to sign the petition aimed at extending the transitional periods stipulated by the MDR. Only a strong stance by actors and stakeholders can persuade policymakers to advocate a prolongation. Patient protection is important, but it must not produce bottlenecks in medical and dental care.

The supply of innovative medical devices is increasingly endangered throughout Europe, according to a survey conducted by the Association of German Chambers of Commerce and Industry (DIHK) and the SPECTARIS industry association. According to this survey, almost 80 percent of medical technology companies expect considerable difficulties in bringing innovative products to market in the future. The reason for this is the introduction timetable for the EU regulations on medical devices (MDR) and on in-vitro diagnostics (IVDR). The additional red tape they create make development more costly and market access more difficult, especially for small and medium-sized manufacturers.

The Notified Bodies will constitute a particular bottleneck. Notified Bodies which have not been (re- notified in accordance with the MDR will lose their Notified Body status. There are currently only two (!) certified bodies – and one of them is in the UK.

The Board of the BDIZ EDI

www.bdizedi.org

Regulation (EU) 2017/745 – MDR

National laws and regulations must be modified

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After more than four years of negotiations, Regulation (EU) 2017/745 of the European Parliament and of the Council on medical devices and amending Directive 2001/83/EC, Regulation (EC) 178/2002 and Regulation (EC) 1223/2009, and Regulation (EU) 2017/746 of the European Parliament and of the Council on in-vitro diagnostic medical devices entered into force on 25 May 2017. With a few exceptions, the Regulation on medical devices will apply from 26 May 2020 and the Regulation on in-vitro diagnostic medical devices will apply from 26 May 2022. The two regulations will replace the Medical Devices Directives 90/385/EEC and 93/42/EEC as well as the In-Vitro Diagnostics Directive 98/79/EC. They are directly applicable in the member states of the EU and therefore do not need to be transposed (adapted) into national law. Nevertheless, extensive adjustments to national medical device laws will be necessary.

Significant innovative aspects of the Regulations include:

- Uniform designation and monitoring of Notified Bodies on the basis of more specific and more stringent requirements
- Creation of a Medical Device Coordination Group (MDCG) consisting of designated experts from all member states
- Introduction of an additional control procedure for the conformity assessments of the Notified Body for high-risk medical devices by a panel of experts ("scrutiny mechanism")
- More detailed specification of the requirements for clinical evaluation
- Detailed regulation of the procedure for approval of clinical trials of medical devices and performance studies for in-vitro diagnostic medical devices
- Stricter provisions on market surveillance and the vigilance system
- Regulation of the reprocessing of single-use devices, including a prohibition of the reprocessing of certain such single-use devices
- Improvement of product identification and traceability by introducing a Unique Device Identifier (UDI)
- Obligation of manufacturers to provide financial coverage in respect of their potential liability
- Extension of the European database for medical devices and in-vitro diagnostics (EUDAMED), which is to be made partly accessible to the public
- New classification rules for software, products with nanomaterials and so-called material medical devices
- Amended classification rules for in-vitro diagnostics, aligned with the four-tier classification for medical devices
- Changes to the conformity assessment procedures for in-vitro diagnostics (including the involvement of EU reference laboratories in the assessment of in-vitro diagnostics of the highest risk class)
- Introduction of the concept of clinical evaluation of in-vitro diagnostics

The EU Regulations require extensive adaptations of the national law and present considerable challenges for manufacturers and other economic actors, Notified Bodies and the competent authorities with regard to their practical implementation. They also need to be complemented by other European implementing acts and guidelines.

Source: German Federal Ministry of Health

The Regulation on medical devices and the Regulation on in-vitro diagnostic medical devices can be downloaded from the EUR-Lex website in different languages.

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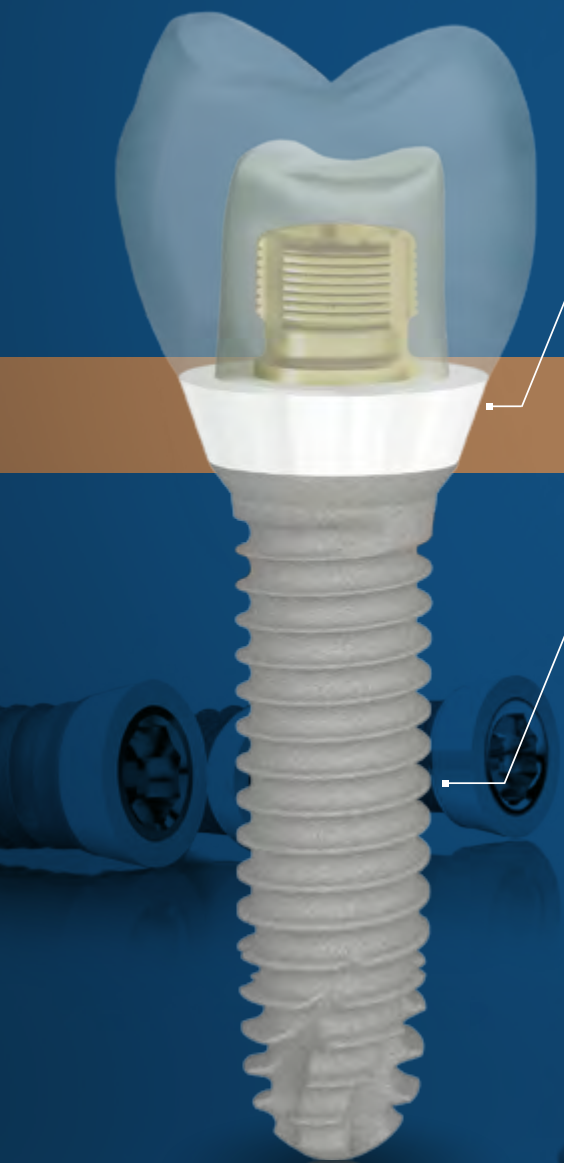

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28th BDIZ EDI European Committee meeting

The MDR is the topmost concern

Once again, the representatives of the partner associations of BDIZ EDI and invited guests met on the occasion of the 2019 Expert Symposium to exchange ideas. The all-pervasive topic in Cologne in early March was the EU Medical Devices Regulation.

The committee consisted of *Christian Berger*, *Professor Thomas Ratajczak* and *Anita Wuttke* of the BDIZ EDI, *Professor António Felino* (Portugal), *Dr Fisnik Kasapi* (Macedonia), *Professor Pavel Kobler* (Croatia), *Professor Vitomir Konstantinović* (Serbia), *Dr Dušan Vasiljević* (Serbia), *Dr Jeroen Pepplinkhuizen* and *Dr Jan Willem Vaartjes* (Netherlands), *Professor Hakan Özyuvaci* (Turkey) and *Dr Vikas Gowd* (India).

The reports from the different countries indicated that state influence on the practice of dentistry is growing, especially in the Netherlands and in Turkey. Other critically assessed topics included the status of health insurance, which does not exist in many countries, and the increasing number of industry-driven continuing professional development (CPD) events in some countries. *Professor Kobler* outlined the status of advanced implantological training in Croatia, where, he reported, any dentist is allowed to perform implantations – with or without special training.

Some red dates in 2019: the 25th anniversary of the Turkish Dental Association and the 30th anniversary of the BDIZ EDI.

A special honor was bestowed on *Professor Felino* from Portugal, who received the highest award of the Portuguese Dental Association (OMD) for his contributions to dentistry. *Christian Berger*, BDIZ EDI President, was re-elected in 2018 as President of the Bavarian Dental Chamber (BLZK) for a further term of four years.

The MDR discussion

Professor Thomas Ratajczak, legal adviser of the BDIZ EDI, presented information about the EU Medical Devices Regulation. He pointed out that there is hardly any product used in a dental practice that is not a medical device in the sense of the MDR. The regulation, which came into force at the end of May 2017, and the regulation on in-vitro diagnostics (IVDR) have increased the amount of red tape and, according to *Ratajczak*, made market access more difficult, especially for small and medium-sized suppliers. The transitional period ends on 25 May 2020. The Notified Bodies not (re-)notified pursuant to the MDR will lose their status at this point; national medical device laws will be repealed, and manufacturers face substantial aggravations associated with bureaucratic hassle and extra costs. The editorial staff of EDI Journal reported on this in the 2/2019 issue and continues its reporting in the present issue.

Coming up in 2020

The 15th Expert Symposium of the BDIZ EDI and, hence the 29th European Committee will again be held in Cologne, 22–23 February 2020.

The BDIZ EDI will be a cooperation partner of EDI Macedonia in Skopje, 28 to 30 May 2020.

AWU

"And the Oscar goes to" (from left): Dr Vikas Gowd (EDI India) thanks Anita Wuttke and Dr Wolfgang Neumann (BDIZ EDI) for their support.

Lively discussions among the participants of this year's BDIZ EDI Europe Committee meeting.

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New BDIZ EDI website launched

Faster, more attractive, more service-oriented

Denser content, innovative technology, a cutting-edge design and a user-friendly interface: BDIZ EDI's new website at www.bdizedi.org is geared to the needs of members and users, i.e. dentists, media, dental organizations – and of course patients. Content is available in German and in English.

With its new web platform, BDIZ EDI aims to provide the best possible service for everyone who is interested in dental implants and implant-supported dental restorations and in the Association's many current topics of interest for dental practices, including BDIZ EDI's information service BDIZ EDI regarding new regulations and laws "made in Brussels" and "made in Strasbourg" that affect dentists and their practices.

Nor will patients who want to learn more about dental implants need to look very far. The "For Patients" menu item provides answers to many urgent questions related to implants and implant placement.

Practice-oriented

The "Professionals" menu item provides information, guidelines and more, with recommendations for practitioners on current issues in implant therapy – such as the Guidelines of the European Consensus Conference (EuCC) organized by BDIZ EDI. The Quality Guidelines of BDIZ EDI for oral implantology and the new definition of indication classes, also by the EuCC, are of equally significant importance for safeguarding the quality of implant treatments.

Europe

European issues are an important aspect of the Association's work and will be represented more extensively on the Internet in future, especially when it comes to current health policy issues and the work of the BDIZ EDI European Committee, which meets twice a year to discuss joint projects and to plan events.

The structured layout of the website and the large image worlds make it easy to find your way around the website. In addition, the new BDIZ EDI website is responsive, meaning that it adjusts automatically to the individual screens of all Android and Apple devices for an optimized viewing experience. The integration with social networks (Facebook & Co.) makes the new website BDIZ EDI's hub for social online communication. *AWU*

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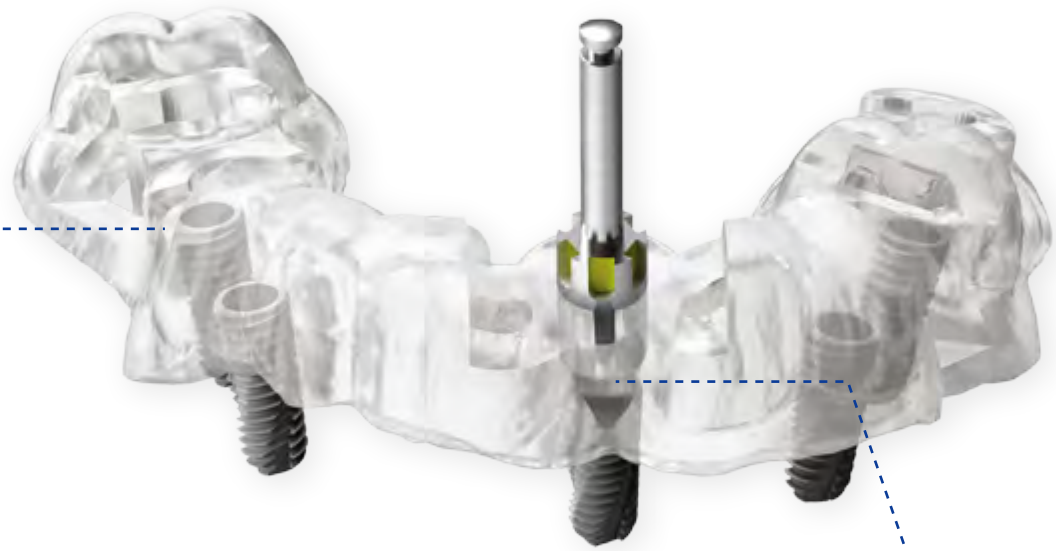

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Annual General Meeting of BDIZ EDI in Erfurt, Germany

Big issue 2020: MDR

The Annual General Meeting of BDIZ EDI in Erfurt in June 2019 gave the Board its go-ahead for the upcoming projects. The AGM particularly supported the strategy process the Board started in 2015 to get the association fit for future. Big issue for 2019 and 2020 is the start of a public campaign concerning the EU Medical Device Regulation (MDR).

AGM 2019 in Erfurt, Germany, with the board members of BDIZ EDI and Legal Advisor Professor Thomas Ratajczak.

The fact that the association has started early to orient itself towards Europe has proven to be a substantial advantage for the BDIZ EDI. The EU Medical Device Regulation is the sword of Damocles hanging over manufacturers of medical devices and will have an impact on the entire health care system and the economy – including dentists. Numerous observers have remarked that there will be too few Notified Bodies to Certify products under the new law as the MDR takes full effect on 26 May 2020. President *Christian Berger* informed that BDIZ EDI will start a campaign to extend transitional period.

For many years, *Professor Joachim Zöller* has served as the Scientific Director of the association. His duties include the search for suitable topics and speakers at the expert symposia, the European Consensus Conferences and the annual symposia. Zöller, BDIZ EDI Vice President, initiated the Curriculum Implantology and is responsible for its contents. Curriculum 20 ended in early summer; its successor, Curriculum 21, will start in October and is fully booked. Since 2004 more than 500 graduates have undergone the curriculum implantology of BDIZ EDI and the University of Cologne.

Secretary-General *Dr Detlef Hildebrand* emphasized that the association endeavors to attract new members among young dentists and that the BDIZ EDI is committed to progress with special programmes for the coming generation. There will possibly be a second Curriculum Implantology, he announced.

Managing Director *Dr Stefan Liepe* said that BDIZ EDI will start acquiring additional expert witnesses among the members of the association to refreshen the expert witnesses pool of BDIZ EDI.

The next major BDIZ EDI event will be the 15th Expert Symposium, going along with the 15th European Consensus Conference to be held in February 2020 in Cologne. Topic: Peri-implantitis.

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Female dentists in Europe

Research as a passion

She is determined and focused. This issue is about Dr Sarah Al-Maawi. The young woman from Frankfurt/Main was born in Baghdad, Iraq, and knows exactly what she wants to achieve in her professional career. She graduated in dentistry and is in the middle of her studies of human medicine. In this interview, she talks about her professional goals.

Name:	**Dr Sarah Al-Maawi**
Profession:	**Assistant dentist in advanced training in oral and maxillofacial surgery and plastic facial surgery; candidate in medicine**
Age:	**27**
Family status:	**unmarried**
Active:	**German Society for Dental and Oral Medicine (DGZMK)** **German Association for Oral and Maxillofacial Surgery (DGMKG)** **Free Association of German Dentists** **European Society for Biomaterials** **Professional Association of German Surgeons (BDC)**

What made you decide to become a dentist?

Already in primary school it was my dream to become a doctor. I wanted to have a profession where I could help people. However, I still had no concrete idea which direction it should take. During school years, I spent the summer holidays doing internships with resident dentists and oral surgeons.

I was fascinated by the regulated and yet diverse working atmosphere, the joy of patients about their "new smile" and above all the practical way of working. Immediately after graduating from high school ("Abitur"), I started studying dentistry at the Goethe University in Frankfurt in the winter semester of 2012.

For a while, I was also very interested in general medicine until I discovered oral and maxillofacial surgery. For me it is the ultimate solution to combine human medicine and dentistry. In the winter semester 2017, I completed my studies in dentistry and have been studying human medicine since the winter semester 2018.

How did your professional career get started?

Through lectures and internships in the Department of Oral and Maxillofacial Surgery at the University Hospital of the Goethe University (MKPG, Director: *Professor Robert Sader*), I had the opportunity to get to know this very interesting field already during my studies of dentistry. I was particularly fascinated by the lectures of *Professor Shahram Ghanaati* (Deputy Clinic Director and Head of the FORM-Lab at the Department of Oral and Maxillofacial Surgery at the University Hospital of the Goethe University Frankfurt). Here I learned that in this subject it is possible to combine basic research with clinical everyday life.

In addition to numerous voluntary internships, I also started my experimental doctoral thesis in the FORM-Lab on the cellular response in the context of biomaterial-based bone and soft tissue regeneration, which I just defended last month. As part of this, I had the opportunity to become acquainted with translational research and to realize the importance of research for the clinic. Since then, research has become another passion of mine. Since graduating in dentistry in 2017, I have also been working as an assistant dentist at the MKPG in Frankfurt.

In the FORM-Lab, you work, among other things, on research into the mode of action of Platelet-Rich Fibrin (PRF). Do you plan to make the leap into practice some day?

To have the opportunity to combine clinic and research is very motivating for me. It makes it possible to research solutions for the daily problems of the clinic and to develop clinically relevant research questions. For me, the direct exchange between clinic and research is the driving force behind both my clinical and scientific work. It is only through research that the physician's spirit remains alert. Since this completion seems very unique to me, I do not plan to switch into practice.

You have been living in Germany for a long time. Where does your family originate from?

I was born and raised in Baghdad/Iraq. When I was 16, I moved with my family to Germany. In the beginning, the change turned out to be very difficult for me and for a while I thought that I might not realize my wish to become a doctor anymore. With a strong will, I was able to graduate from high school in Berlin in the summer of 2012 and start studying dentistry in Frankfurt directly in the winter semester of 2012.

What are your hobbies?

In my spare time I like to do sports. During skydiving I love to look at our beautiful world from above; it helps me to unwind completely from everyday life. I also enjoy hiking as well as photographing landscapes and animals.

Thank you very much, Dr Al-Maawi, for the interesting conversation.

The interview was conducted bei Anita Wuttke, Editor-in-Chief.

20th Curriculum Implantology of BDIZ EDI and University of Cologne

Success story for both partners

The Curriculum Implantology, jointly arranged by BDIZ EDI and the University of Cologne, has been offered since 2004, and it has always been fully booked – which once again happened almost immediately after the course schedule for the 20th round was published. Now the 20th Curriculum Implantology ended in June 2019 with a final exam.

In the course of one year, the soon-to-be implantologists had to complete eight modules in the field of oral implantology. After having successfully passed the final exam, the participants were rewarded with a graduation certificate, which was handed over during the graduation ceremony at the University of Cologne.

Today, the curriculum offers eight modules in two-day courses, including observation and supervision by experienced instructors. The overall objective is practical relevance. To achieve this, the teaching modules and its contents are subject to constant updating. After successful observation and supervision, participants can take the exam for the formal professional focus on oral implantology if they can show proof of the required practical experience. The instructors are experienced implantologists and have presented the teaching units with videos and live patient demonstrations for many years. Each course includes practical sessions, most of which use realistic training models or human specimens rather than the usual plastic jaws. “The teaching units were designed to highlight the interrelationships between prosthetic and surgical aspects, even if the main topics concentrate on one or the other subject area”, said *Zöller*. “The limited number of participants guarantees an intensive exchange of experience with the instructors.

Photo: University of Cologne/Thieß-Schöning

The photograph shows the graduates of 2019 with their teachers.

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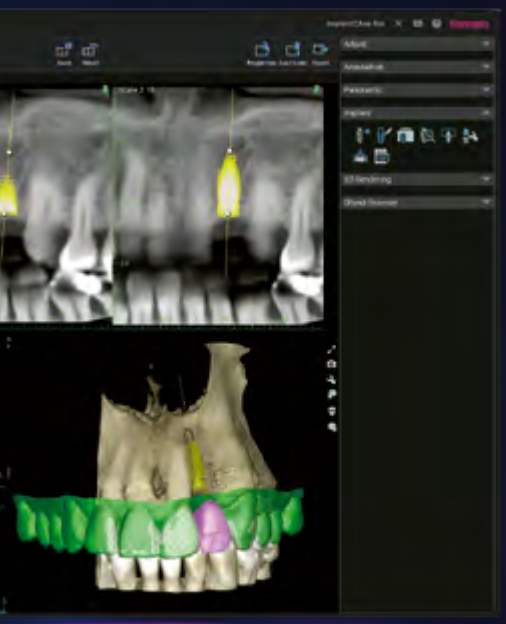

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Save the date: 14th European Symposium to be held in Skopje in May 2020

State of the art in Skopje

One of the highlights of the BDIZ EDI year is certainly the European Symposium, held annually with changing partners in changing European countries. The 14th European Symposium will be held in Skopje, Macedonia, from 28 to 30 May 2020.

BDIZ EDI is the cooperation partner of the AIAM – Albanian Implantology Association of Macedonia together with EDI Macedonia, the associated partner of BDIZ EDI, founded in 2017. The 3rd international symposium of AIAM will come along with workshops and scientific programme for all implant dentists and throughout.

"Small opportunities are often the beginning of great enterprises." This quote from Demosthenes has been characteristic of the history of BDIZ EDI's European symposia. Humble beginnings and spurious opportunities have been consolidated into a comprehensive approach that allows communities of dentists to transcend national borders and to intensify the exchange of ideas within Europe. The European Symposium is based on the proven educational concept of BDIZ EDI to promote an active exchange of dental knowledge at the European level. The AIAM will be the host of the BDIZ EDI and its European Symposium for the first time. ■

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European dentists call for uniform professional supervision

No special rules for dental chains

At its spring General Meeting in Vienna in late May 2019, the Council of European Dentists (CED) demanded that there should be no special rules for dental chains and that they should be members of the dental chambers and associations, because this was the only way to ensure uniform professional supervision in the interest of patient protection.

The representatives of all national dental chambers and associations were agreed that not individual dentists and dental corporations (as legal entities) must be subject to the same professional rules and supervision. As CED President *Dr Marco Landi* pointed out: "We share the concern that the commitment of financial investors, whose primary goal is to maximize profits, will ultimately work against the high quality of dental care and against the interests of our patients." At its next General Meeting, the CED should therefore clearly adopt the position that all institutions of dental care, whether organized in the form of individual practices, dental corporations or otherwise, must be subject to the same professional regulations and – where applicable – the same type of supervision by professional chambers in order to ensure a high quality of care.

The CED's spring consultations focused on current developments in health policy at the European level and on the impact of the EU internal market on dental services, linking the issue to the implementation of the recently adopted EU directive calling for proportionality tests for professional regulations law as well as the decision of the European Court of Justice (ECJ) on dentists and advertising. As early as November 2018, the CED had adopted a resolution on "Corporate Dentistry in Europe".

Source: CED

Photo: pixabay.com/misterfarmer

WHO Conference in Ljubljana

Focus on equal health opportunities

Demanding equal health opportunities is more important than ever. This was the general consensus at the WHO conference held in the Slovenian capital Ljubljana in June. Nevertheless, imbalances in health care persist in many countries. There was broad agreement on the correlations of social status with the risk of contracting diseases on the one hand and access to health care services on the other. Accordingly, health care is in a difficult situation in economically weak countries, such as those in Eastern Europe or Central Asia, where average unemployment rates among young people are between 15 and 17 per cent. Youth unemployment is closely linked to social exclusion and related mental and other health problems. Municipal partnerships and strategic alliances must be forged to expand working and employment conditions in these countries. Financial independence can empower young people and provide greater participation in social life and easier access to health care.

For example, the poorest country in Europe, the south-eastern Republic of Moldova, frequently fails to provide its population access to health care due to high unemployment, widespread poverty and a poorly managed health care system blemished by corruption.

The "Healthy Generation" project initiated in Moldova aims to give young people access to health information and high-quality health care services. The result has been a network of 41 youth-friendly health centres that provide health care services in many fields such as sexual and reproductive health, eating disorders and psychological or violence-related problems. They also offer general medical services. According to the WHO, about 25 percent of young Moldavians use these centres.

Inequality in health care is not specifically an Eastern European or Central Asian problem. Nor is

it a matter of age: for example, a project in Italy is aimed at older people. The aim here is to recognize frailty at an early stage and to initiate appropriate countermeasures. The focus here is on improving living conditions while also contributing to equal health opportunities. Some households are entitled to free assistance, for example to help them improve their energy balance by installing a gas boiler or central heating.

Source: www.health-inequalities.eu

Health care systems are a national responsibility

EU interferes anyway

"Serious inequalities in health-care provision and social hinders must be eliminated", according to the latest EU report on this subject, published in 2013. Former Health Commissioner Vytenis Andriukaitis has his hands full, despite the fact that responsibility for the national health care systems accrues to EU member states alone, with food safety just as much a part of his portfolio as the supply chain for medical drugs. But the most important instrument of health care policy the EU can muster is prevention. An activity report by ex-president *Jean-Claude Juncker's* European Commission listed the following prophylaxis measures:

- A strategy against the use of tobacco, which ultimately led to a broad ban on smoking in public places.
- The fight against alcohol abuse is just as much a part of this as are programmes against obesity. However, Brussels has not yet done much more than to force manufacturers to disclose the presence of added sugar on food labels and to prohibit marketing strategists from making scientifically unproven advertising claims.

In the new legislative term, the EU wants to take "more direct" steps to ensure better health for the approximately 500 million EU citizens. In particular, research policymakers have identified a new focus: the fight against cancer. Although oncologists warn against raising hopes prematurely, an unspoken but widely heard promise is in the air: Ten years from now, no child in the EU should die of cancer any more. Brussels wants to support research to the tune of billions of euros and ensure that the results can be applied in everyday clinical practice.

But the EU has committed to tackling even more health-related issues, such as the digital transformation in medicine and the provision of cross-border medical care. A pilot project is currently underway along the border between Portugal and Spain, where insurance companies, medical associations and physicians in private practice have teamed up so that a Spanish colleague can help out in the Portuguese neighbourhood if needed – and be sure to get paid.

The EU has also made the fight against spreading antimicrobial resistance a priority. Brussels sources report that "this does not require any competency for the medical aspects of health care policy. Occupational health and safety, the internal market, social security all provide us with enough starting points to achieve something that member states can then expand on."

Source: Deutsche Ärzte-Zeitung, Germany

Photo: Grecaud Paul/ stock.adobe.com

Combating dental caries

A German president for ORCA

A German dentist and researcher now heads the Organization for Caries Research (ORCA). *Professor Christian Splieth* (Greifswald University Medical School) became president of ORCA at this year's ORCA World Congress in Cartagena (Colombia) following a successful international online election in 2017. Caries continues to be one of the world's most common diseases and is associated with enormous costs to health care systems. However, the history of caries prevention is a scientific success story, as effective preventive measures have been established as the causes of the disease were identified, leading to significant reductions in caries incidence in many countries. "The Organization for Caries Research (ORCA) has played a major role in ensuring that children, adolescents and increasingly also adults have healthy teeth. For me to be elected to this important office is an honour for Greifswald and is a sign of international recognition for our work in this field", said Splieth. Born in Bremen, Splieth is the head of the Department of Preventive and Paediatric Dentistry at Greifswald University Medical School. The European Organization for Caries Research (ORCA) is a research organization that promotes oral health through scientific research in the field of cariology. Founded in 1953 as an international organization based in Amsterdam, the association has united dentists from all over the world.

Source: http://www.orca-caries-research.org

Photo: www.orca-caries-research.org

Professor
Christian Splieth

ECJ invalidates the schedule of fees for architects and engineers

No impact on the health care sector yet

On 4 July 2019, the European Court of Justice (ECJ) ruled that central provisions of the official scale of fees for services by architects and engineers (HOAI) infringed Community law (Case C377/17). Accordingly, it is not compatible with Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market (Services Directive) to set fixed tariffs for the planning services of architects and engineers in Germany.

The ECJ expressly contradicts the European Commission, which had initiated the proceedings, on essential points. Minimum and maximum tariffs do not per se constitute an unjustified interference with the freedom of establishment and the freedom to provide services. On the contrary, setting minimum prices for professional services might, according to the Luxembourg judges, "prevent services from being offered at prices which cannot guarantee the quality of those services in the long term".

ECJ decision tends to vindicate the setting of fixed tariffs for the health professions

But there is also another reason why the ECJ ruling leans more in favour of fixed fee scales for the health care professions. Unlike individual services provided by architects and engineers – and specifically planning services as in the case at hand – which may also be offered by "non-architects", the practice of a medical profession is by law restricted to licenced doctors or dentists, psychotherapists or pharmacists. State approbation (a state licence) is a mandatory requirement for the practice of medicine. In this sense, the Luxembourg judges' criticism of the arguments presented by the German federal government seems understandable to the extent that the minimum tariffs set by the HOAI are justified in the interest of ensuring quality. Even if it sounds paradoxical, the very lack of regulation of "non-architects" has meant that price regulation is becoming a problem for architects from the point of view of European law.

Even the President of the German Federal Chamber of Architects (BAK), *Barbara Ettinger-Brinckmann*, can to some extent understand the ECJ ruling: "In Germany, planning services are not the exclusive realm of specific professions made subject to mandatory supervision of their qualifications by a professional chamber or association. These services can also be provided by other, non-regulated service providers than architects or engineers. Since the providers of the services that are subject to the minimum tariffs of the HOAI do not themselves have to show guaranteed minimum qualifications (or, in other words, demonstrate their professional capacity), minimum tariffs alone are not very helpful in ensuring quality. This situation, therefore, constitutes a flaw in the system itself. If the services provided in the HOAI were reserved to architects and engineers supervised by a professional chamber or association, the ECJ would probably have declared fixed minimum tariffs compatible with EU law."

As early as 2015, the EU Commission had pointed out that the HOAI tariff regulations might restrict fundamental freedoms under European law, in particular the freedom of establishment. The German government had argued that the fee restrictions were justified by overriding reasons relating to the public interest. In its subsequent action before the ECJ, the Commission argued that the setting of minimum and maximum tariffs prevented suppliers from other member states from gaining access to the German market. The "overriding reasons relating to the public interest" invoked by Germany could not justify such regulations within the framework of a legislated scale of tariffs. The German government had justified the "public interest", inter alia, by pointing out that, if a certain price level was undercut, it would have to be assumed that the lower price could only be achieved by lower-quality services.

Conditions for price regulations

In its decision, the ECJ states that price regulations are in principle permissible under European law if they fulfil three conditions. Firstly, they must not be discriminatory in nature. Secondly, they must be justified by an overriding reason relating to the public interest, and thirdly, they must observe the principle of proportionality.

According to the Luxembourg judges, the setting of tariffs under the HOAI does not discriminate against service providers from other EU member states in any way. The Court also accepts the argument that minimum tariffs pursue the objectives of safeguarding the quality of planning services, consumer protection, building safety, the preservation of an architectural culture and ecological construction imperatives. The same applies to the reference to consumer protection, which is to be ensured by setting maximum tariffs. "Quality" and "consumer protection" have repeatedly been recognized by the ECJ as overriding reasons relating to the public interest.

The Court confirms that minimum prices may be set if they help avoid a level of competition "that results in offering services at a discount, with the risk of deterioration in the quality of services provided". The ECJ had already argued similarly in 2006 in a case that concerned Italian lawyers' fees. Or in the ECJ's own words in the present ruling: "In such a context, the imposition of minimum tariffs may be such as to help to limit that risk, by ensuring that services are not offered at prices that are inadequate to ensure, in the long term, the quality of those services." This had been sufficiently demonstrated by the German government with regard to the HOAI, something the Commission cannot challenge. This line of argument can be directly transferred to the issue of medical and dental fee regulations.

But: German arguments "not coherent"

However, in accordance with the Court's settled case law, national legislation is appropriate for securing attainment of the objective pursued only if it genuinely reflects a concern to attain that objective "in a consistent and systematic manner". Which is pure legalese but in effect means that, since the provision of planning services is not exclusively reserved for persons exercising a regulated activity, there is no guarantee that the planning services will be provided at a consistently high level. Thus, if in Germany planning services can be provided by service providers who have not demonstrated their respective professional capacity, then the logic of the arguments citing a concern for quality assurance is defective. The court therefore states "that the Federal Republic of Germany has failed to establish that the minimum tariffs laid down by the HOAI are suitable for securing the attainment of the objective of guaranteeing a high level of quality of planning services and ensuring the protection of consumers." Period.

And what about the maximum tariffs? This, according to the ECJ, could contribute to consumer protection "by increasing the transparency of the tariffs applied by the service providers and preventing them from charging excessive fees." But here, too, the German government has failed during the proceedings before the ECJ to demonstrate why the possibility of providing guidance as to the prices for the various categories of services covered by the HOAI might not suffice to achieve adequate consumer protection. Hence, the setting of maximum tariffs cannot be regarded as being proportionate to that objective.

To conclude: The scale of tariffs for architects and engineers does not conform to European law and must be amended. The EU Commission has won a battle on the way to deregulating the professional law of the liberal professions. ››

Photo: Sergii Figurnyi/stock.adobe.com

What drives the EU Commission?

To understand the strategy of the EU Commission, we must start from the goal of a deepened single market for the 500 million consumers in Europe today. Brussels sees the single market as one of Europe's greatest achievements and its most important "trump card in times of ongoing globalization". Only freedom of movement, and in particular the free movement of services, can create growth and new jobs, and this has been the stated objective of the EU Commission for many years. And it is only thanks to the tireless efforts of the liberal professions and their associations in Brussels that even more far-reaching deregulation attempts have not yet been successful.

It was therefore important and right to point out time and again during the discussion on a new directive on proportionality testing before adopting new professional regulations, which entered into force in June 2018 and is to be transposed into national law by summer 2020, that the exercise of a liberal profession is not the same as pursuing commercial activities. The core values of the liberal professions must not to be equated with arbitrary corporate goals. Central elements of professional law, such as the restrictions on non-professionals holding assets of professional partnerships, also serve to protect patients and clients. Self-administration musters greater expertise in regulating the practice of the profession than state regulators. And the EU Commission does not have any comprehensive competence to regulate the liberal professions, especially not in the health care sector. The European Treaties are characterized by the principle of subsidiarity rather than a centralist approach in which Brussels decides and the member states of the European Union implement.

Does Brussels respect subsidiarity?

But the Commission is not letting up. With its tender for studies to investigate the links between professional law and the quality of the services provided, it has launched the next general attack on the liberal professions in Germany and elsewhere. Even convinced Europeans find it increasingly difficult to comprehend the Commission's apparent sense of mission. With great effort and with the support of committed members of the European Parliament, the "Proportionality Directive" has succeeded in highlighting the importance of the health care professions in ensuring a high level of health protection. It also states that it is for the member states to decide whether and how a profession is to be regulated, provided that the principles of non-discrimination and proportionality are respected. But the decision of the ECJ on the HOAI shows that this does not guarantee the persistence of existing professional law or, for example, the fee regulations.

It will therefore be interesting to see whether the new Commission under its president *Ursula von der Leyen* will continue to follow the strategy of its predecessors in terms of attempting the "deregulation" of professional law in the liberal professions. The German government has unnecessarily weakened its own line of argumentation for strengthening the liberal professions through the "liberalization" of access to the profession for capital investors in medical care centres, as set out in Book V of the German Social Code. Again, the German position is "not coherent", which might produce a backlash if and when the European Court of Justice is called upon to discuss corporate law related to the liberal professions.

Contact address

Peter Knüpper, solicitor
Ratzel Rechtsanwälte
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Fabricating X-ray stents and drilling templates without "negatives"

Efficient and "accurate"

DR ANDRÉ HUTSKY, AND MDT DANIEL ELLMANN, MDT, BOTH BERLIN, GERMANY

Oral implantology is increasingly taking centre stage due to the growing number of older patients and a general desire for fixed or fixed-removable restorations for the partially edentulous jaw. Natural dental aesthetics and improved chewing comfort are seen as particularly important. Of course, a proper clinical examination and appropriate diagnosis and indication that determines the patient's individual risk profile must precede any successful implantological treatment. "Backward planning", where the implant-supported restoration is planned backwards from the parameters of the ideal rehabilitation, can identify risks in a timely manner and eliminate them ahead of any actual surgical implant placement.

In addition to planning models (wax-ups and mock-ups) and classical panoramic tomography, as well as single-tooth radiographs, the three-dimensional simulation of implant situations and more complex surgical procedures promises to make the planning process more reliable, with more predictable results. In difficult circumstances, computer tomography (CT) or its variant, cone-beam computed tomography (CBCT) can provide additional details at generally lower radiation exposure [European Commission, 2012; *Loubele* et al., 2009; *Ludlow* et al., 2006; *Ludlow and Ivanovic*, 2008; *Pauwels* et al., 2012].

This is of increasing forensic significance in the context of the documentation requirements associated with medical liability. Acceptable indications include: reduced bone quality, a reduced vertical/horizontal bone supply or an intended implant position in the immediate proximity of vascular and nervous pathways. The question thus arises to what extent the consistent integration of digital design and implant planning systems – as exemplified by the Organical Dental Implant software – can add precision and ensure a stable process.

"Precise" does not automatically mean "accurate"

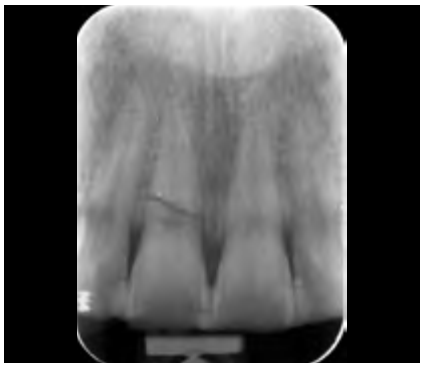
According to the relevant ISO definition, "precision" is a limited component of "accuracy" from the point of view of reproducibility. As a result, technical processes can be highly precise, but still inaccurate. To establish an accurate procedure, it is important to coordinate all the building blocks in a complex process so that they deliver precise and at the same time correct ("true"), validated and verifiable results. Many currently available implant planning systems and the resulting drilling templates do not actually provide these results. Specifically, the exact fit of the drilling sleeves in the template cannot be verified by a standardized test procedure, regardless of whether the drilling templates are manufactured manually or industrially.

The Organical Dental Implant planning and design software is a system based on a patented, seamless digital workflow that provides more reliable results for implant dentists, dental technicians, and – most importantly – the patient. Using a specially developed organic reference plate, which is implemented in the CBCT VT diagnostic template (X-ray splint), all surgically relevant information is captured and transferred to the corresponding implant-planning software for further processing.

More than just an X-ray splint

Based on a conventional impression or an intraoral scan of the jaw, a phonetically and functionally coherent X-ray splint is first produced. This step can be performed analogously but should preferably be digital to avoid or reduce later reversals, eliminating a potential source of error. The teeth to be replaced can be designed in appropriate CAD software (for example, Exocad standard software and plug-ins). The preliminary implant axis can be animated with a continuous channel in the designed tooth if desired. The CBCT image can be used to check if this preliminary axis can be surgically implemented or whether corrective measures must be taken. Overlaying the digital working model or intraoral scan with the teeth designed in this manner creates a model of a fully dentate jaw. This model can be used to quickly and cheaply produce a digital design for an X-ray splint.

The key to greater precision and perfection is the consistent integration of the Organical reference plate with zirconia spheres as reference objects, arranged in an innovative arithmetical and physical pattern. This enables an



1 I Radiograph taken after a bicycle accident.

unambiguous adjustment of the CT/CBCT jaw image data in terms of size and dimension.

X-ray splints with larger reference objects such as Lego bricks are more difficult to position in the patient's mouth, especially if mouth opening is constrained or the jaw is small. Any integration – let alone a simultaneous one – of two of these X-ray splints in the splinted maxilla and mandible presents as almost impossible even with "normal" teeth. However, this would undoubtedly be helpful if maxillary and mandibular implants are planned for a given patient, whose radiation exposure could be significantly reduced with a single, simultaneous CBCT VT image of both jaws. The slim design of the Organical reference plates usually allows simultaneous CBCT imaging, which reduces X-ray exposure. Moreover, these reference plates have larger contact surfaces for secure occlusion-defined attachment to the X-ray splint.

The digitally generated X-ray splint is adapted by placing an exact contact surface for the reference plate above and parallel to the bite plane. CBCT extinction and beam-hardening artefacts in the masticatory plane [*Schulze* et al., 2011] due to high-density structures in the direction of the beam path [*Zhang* et al., 2007; *Schulze* et al., 2010, 2011] can thus be sustainably reduced.

There are various options for transferring these design data to the computer-aided manufacturing/prototyping (CAM) process. Either a five-axis milling machine (such as a VHF Dental K5 or S1 or an Organical Desktop 8S) or a 3D printer (such as al Formlabs Form 2 or an Asiga MAX DLP) can be used for this purpose. It is important that the process used in conjunction with the respective production system is identical to the process used for subsequent production of the drilling template, in order to reduce the effects of the tolerances inherent in the system to a minimum.

Fast and consistent implant planning

The X-ray data generated with this X-ray splint are integrated into the Organical Dental Implant planning and design software. The planning team will next prepare an implant placement proposal based on the dentist's communicated wishes and requirements. Registration is performed by computer-aided recognition of the reference spheres and after determining the individual positions and sizes of the cavities by an automated allocation of implants of suitable sizes. Time-consuming CBCT data matching with model data acquired intra- or extraorally is not necessary, although possible in principle.

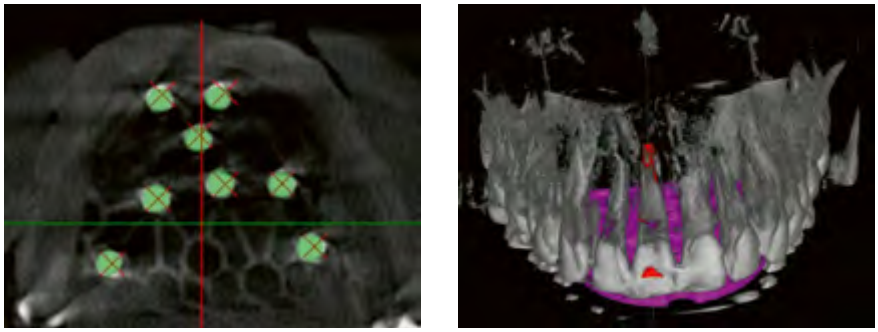
There are no file-size limitations, which allows the import of STL files and the processing of high-resolution datasets and thus provides extra precision. A pre-installed library within the implant-planning software includes implants and sleeve systems from all major manufacturers. Even more rarely used systems can be integrated on request if all the requisite parameters are provided.

Following approval by the dentist, the planning software will generate an STL dataset with all the necessary information on the implant-related drilling sleeve and drill stops as well as their exact three-dimensional positions within the drilling template. At the same time, the dental technician could produce provisional CAD/CAM dentures that could be modified to meet the functional and aesthetic criteria during the healing phase and used as an immediate restoration.

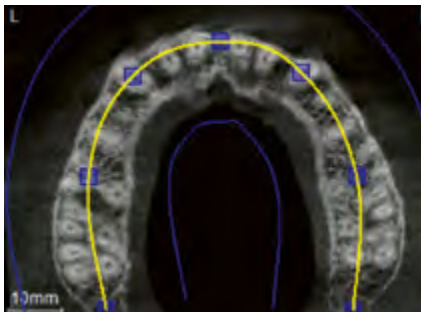
Clinical case 1:
A perfectly safe surgical template

If the in-office or partner laboratory has a suitable milling machine, the finalized X-ray splint can be clamped in a patented zero-point clamping system (Figs. 5a to c). The IGES (Initial Graphics Exchange Specification) planning data are then loaded into the CAM software. All drill holes are milled in the X-ray splint as previously planned digitally, with accuracy to the micrometre, effectively converting the X-ray splint into a drilling template. This procedure demonstrably reduces production tolerances and the mean deviations of the implant dimensions to a minimum, especially since the same template is used throughout the process – and reduces laboratory costs by a factor.

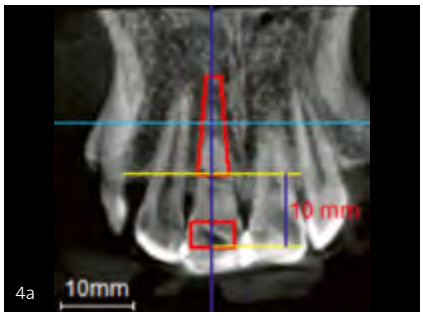
This approach was followed in the first clinical case presented here. The patient had suffered a transverse fracture of tooth 11 in the course of a bicycle accident, a fracture that could no longer be treated conservatively (Fig. 1). To stabilize the crown fragment initially, it was attached to the adjacent tooth with composite resin during the diagnostic procedure. Based on an impression, a phonetically and functionally appropriate X-ray splint had previously been created that was then adhesively attached to the Organical reference plate. The finalized X-ray splint was checked for fit and then worn by the patient during the intraoral CT/CBCT scan (Figs. 2a and b).

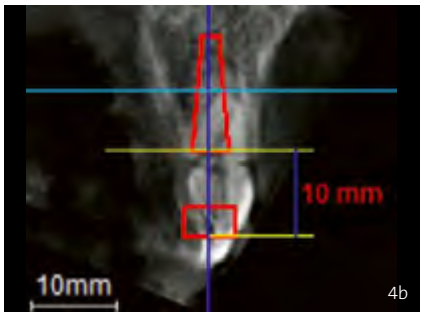


2a and b I Creating an X-ray splint (a) that includes an Organical reference plate (b).

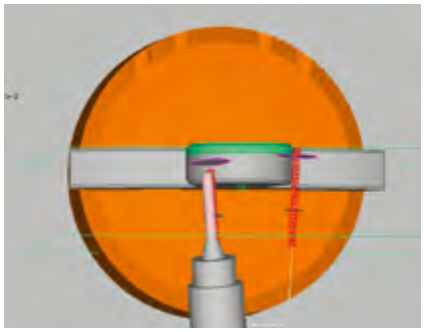


3 I Segmenting in the planning software and adapting the panoramic curve to the existing anatomical structures.

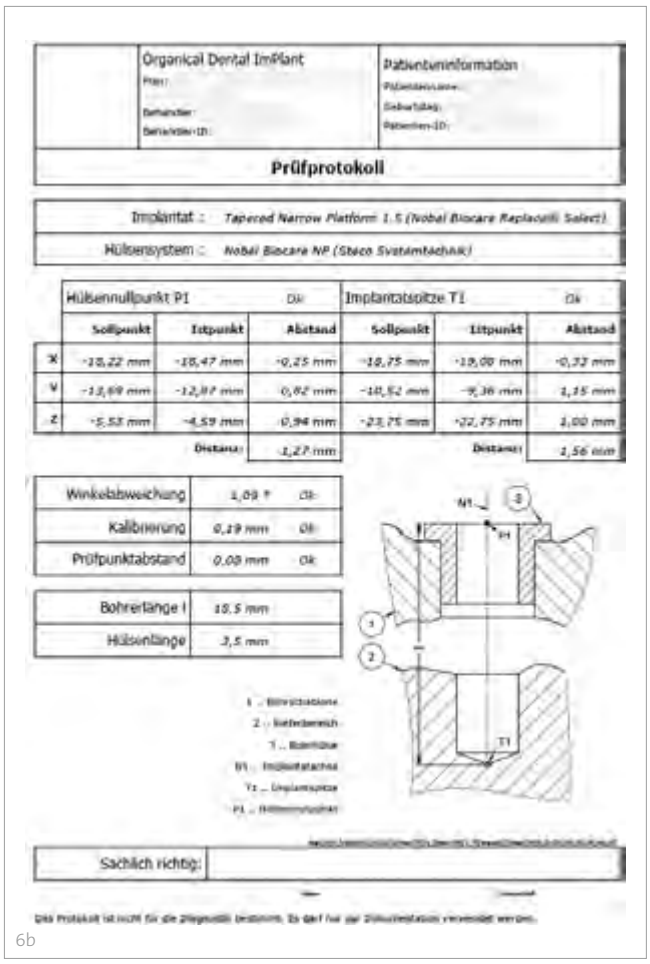




4a and b I At the implant planning stage (a), the tilted anterior crown and the very limited crestal clearance (b) became evident.

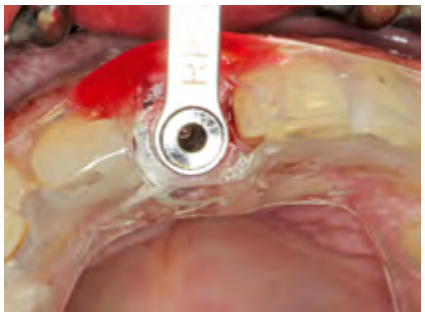
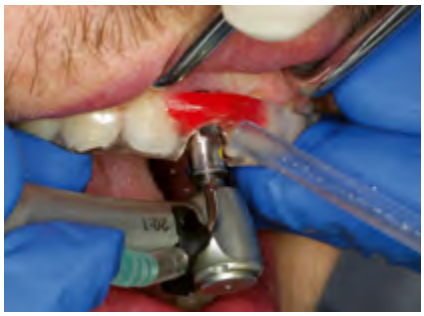
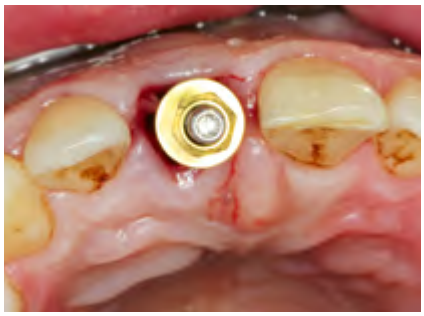


5a to c I Converting the X-ray splint into a drilling template via a patented zero-point clamping system in the dental milling unit.

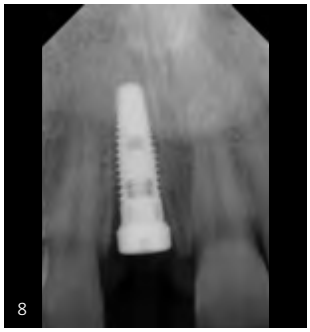


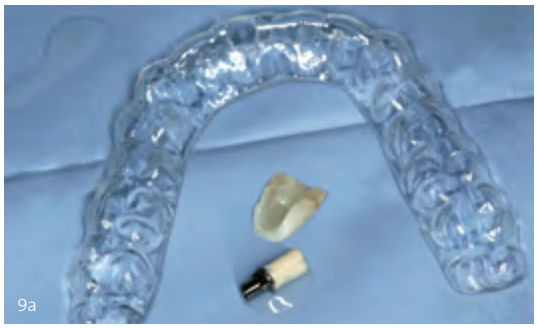
6b

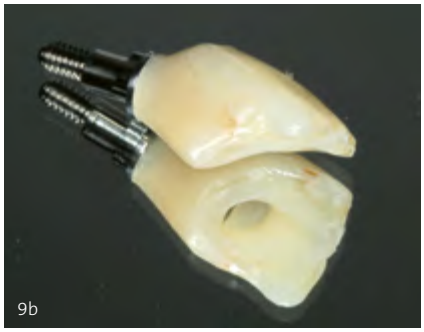
6a and b I Surveying the finalized implant drilling template with a calibrated test table in the X, Y and Z axes, the diameter and the depth stop in relation to the sleeve system (a) and preparation of a test report (b).

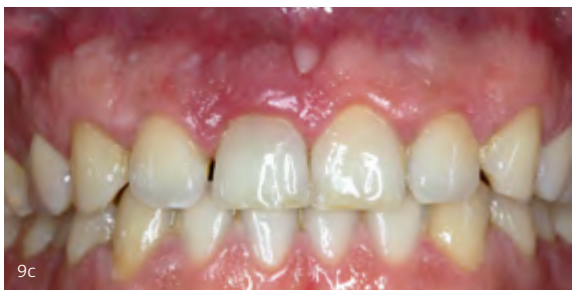




7a to c I Fully navigated implant placement at site 11 using the X-ray splint converted to a 3D drilling template.









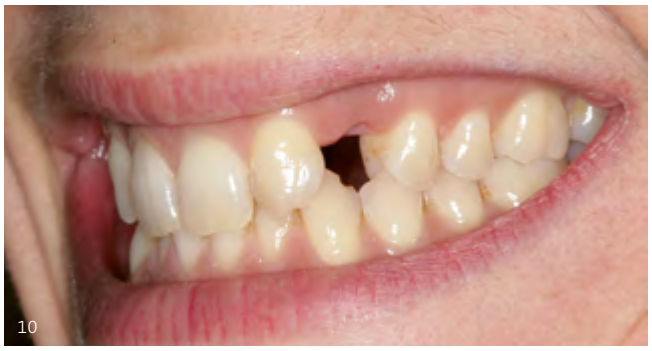
8 I Control radiograph with gingiva former.
9a I Transfer splint for the temporary abutment.
9b and c I Provisionalization without immediate loading.

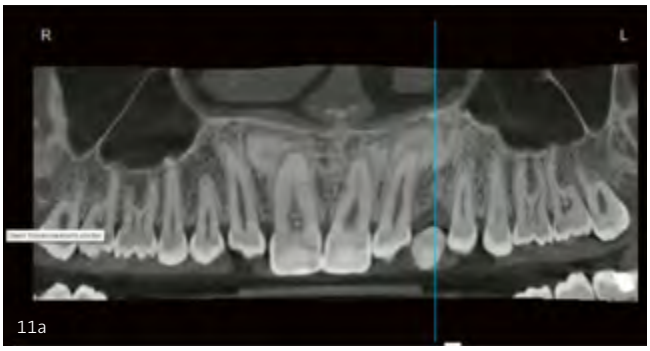
The data thus generated were imported into the implant-planning software. The CT/CBCT dataset was reduced to the area of interest and segmented. In order to adapt the panoramic curve to the anatomical structures, two (!) curves were created following the course of the nerve (which had been exactly marked) and the alveolar ridge (Fig. 3), which made the image more precise and easier to work with in the planning software (Figs. 4a and b).

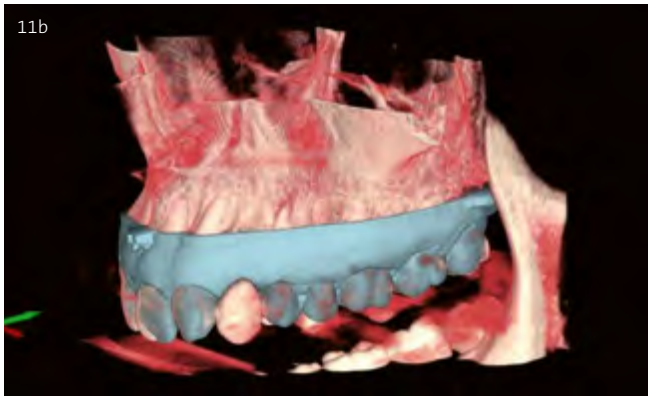
This case highlights the diagnostic significance of CBCT. The anterior maxillary crown was severely tilted (Fig. 4b). As there was hardly any crestal space available, the implant could not be placed directly within the socket. During manual implant placement, the risk would have been too great that the implant drill could slip, so that a fully navigated implantation seemed inevitable. With the help of the X-ray data generated and on the basis of the virtual implant planning and design result, an implant proposal including the exact position of the drill holes was developed (Figs. 4a and b). A high-precision milling unit was used to convert the X-ray splint into a drilling template (Figs. 5a to c).

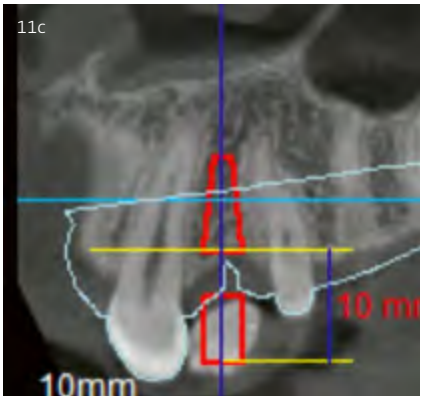
Next, the implant-related drilling sleeves were inserted into the drill holes and secured in place. A final survey of the finalized drilling template using a calibrated testing table ensured the positional accuracy of the drilling sleeves. This "five-fold reassurance" for the treatment team and the patient is achieved by measuring the X, Y and Z axes, the diameter and the depth stop in relation to the sleeves (Fig. 6a). The determined positions are then compared with the testing protocol generated by the software (Fig. 6b). Deviations from the planned emergence position can be detected (and excluded) beyond doubt. The remaining crown fragment of tooth 11 and its root were extracted in an atraumatic procedure that preserved the local hard and soft tissues, and the fully navigated implant placement could proceed.

A tapered implant was inserted at site 11 (Nobel Replace Tapered Groovy RP, 4.3 × 13 mm; Figs. 7a to c). To ensure primary stability in the context of immediate restoration, compliance with the prescribed torque is indispensable. Finally, a gingiva former was used to radiographically check the inserted implant for correct seating (Fig. 8). A plastic transfer splint based on opaque-covered titanium (coloured; Fig. 9a) was used as a temporary restoration without immediate loading (Figs. 9b and c).









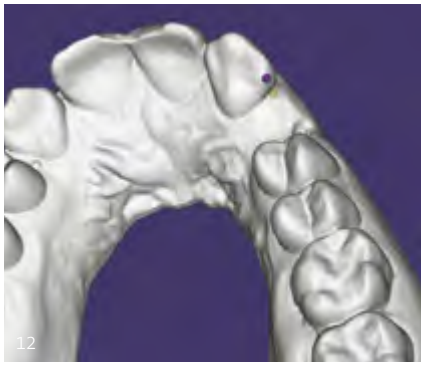
10 I Loss of the persistent deciduous tooth 64 (after orthodontic gap opening).

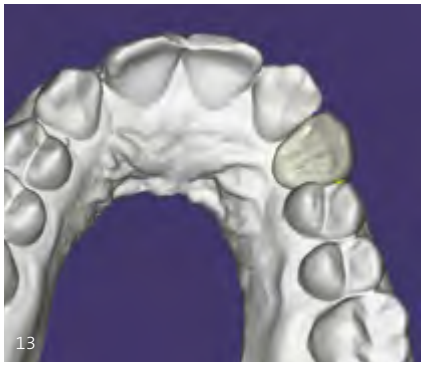
11a to c I CBCT scan and overlay scan.

Patient case 2:
3D-printed drilling template

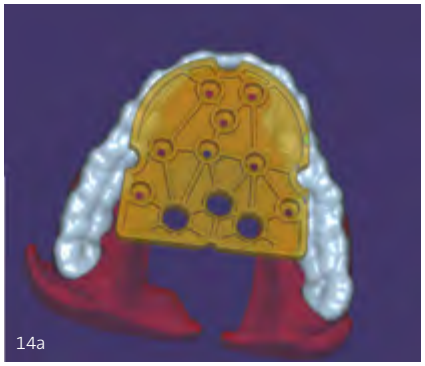
In this case, a patient was to receive an implant-supported restoration after a gap had been opened orthodontically and his persistent deciduous tooth 64 had been lost (Fig. 10). Once again, the CBCT image (Figs. 11a and b) impressively proved that it was indispensable for precise planning, as this was the only way to recognize that there was hardly any space available for an implant in the area where the implant tip would have to be located (Fig. 11c).

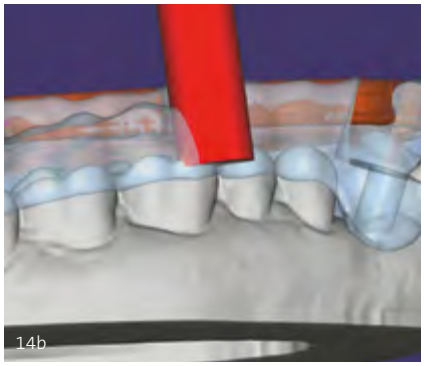
The diagnostic cast was scanned with a laboratory scanner (Fig. 12). A virtual

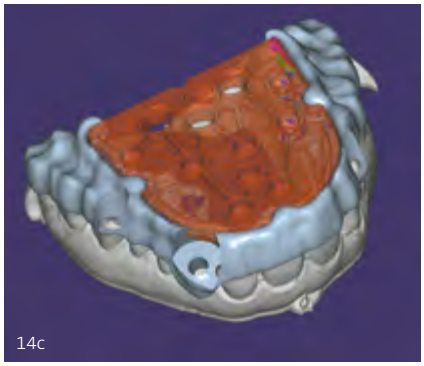


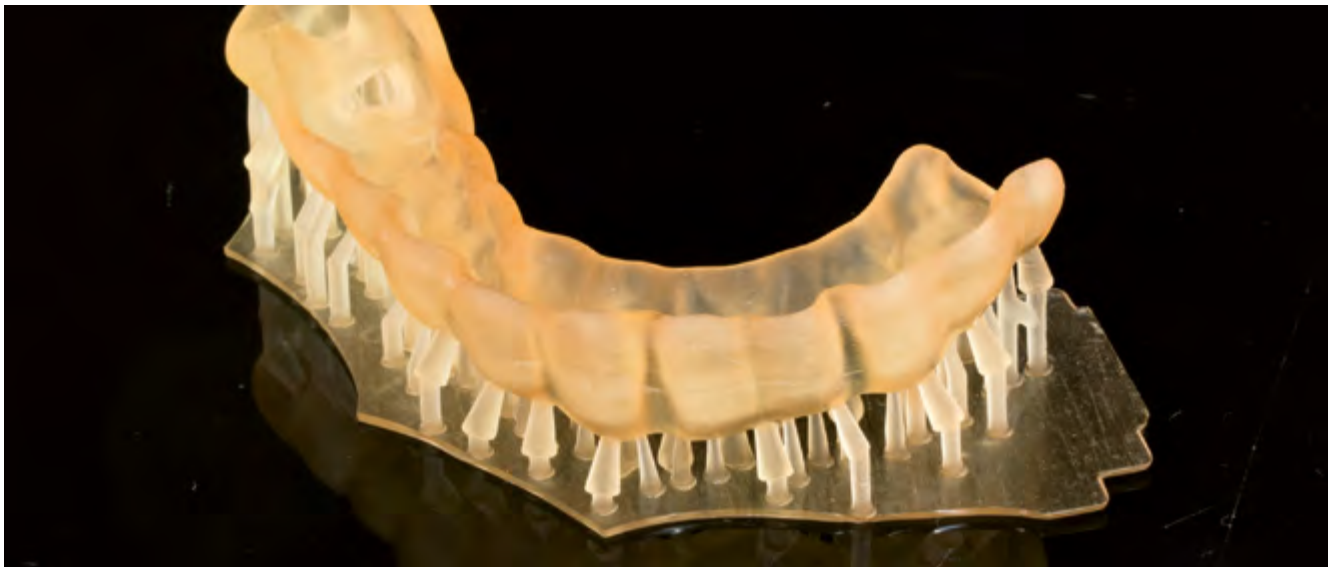


12 I Scan of the diagnostic cast.
13 I Virtual wax-up.
14a and b I Design of the 3D drilling template (a) with fenestrations (b).
14c I Complete 3D drilling template design.







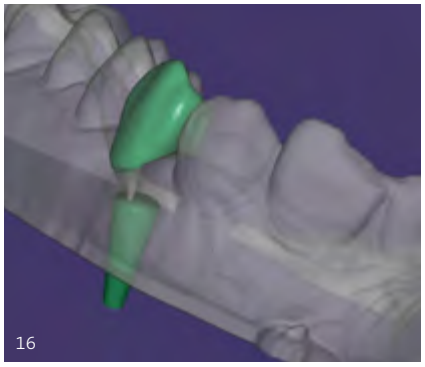


15 I Additively produced drilling template (3D print).

wax-up was created using CAD design software (Fig. 13). As an alternative to the procedure described for clinical case 1, the STL planning data were overlaid with the X-ray splint design of the CAD software, such that the drill holes were digitally "punched out" along with the drill stops (Figs. 14a and b). This X-ray splint, too, could thus be converted into a drilling template, this time digitally on the screen (Fig. 14c). If the drilling template is now fabricated using the same process as the X-ray splint, almost fully congruent results can be achieved. This can be achieved by either 3D-printing (Fig. 15) or by milling.

For the CAD-based fabrication of the restoration, the digitally planned implant position and the surrounding virtual model were exported from the planning software, preserving all positional information. Implant interfaces as stored in the system library were assigned in the CAD design software (Fig. 16). The emergence profile was defined (Fig. 17) and a definitive hybrid zirconia abutment was designed. This abutment was expected to provide a gingival seal based on the attachment of connective-tissue fibres to the zirconia. The provisional was designed on the hybrid abutment (Figs. 18a and b).

The hybrid titanium crown was milled from a premilled abutment blank, and



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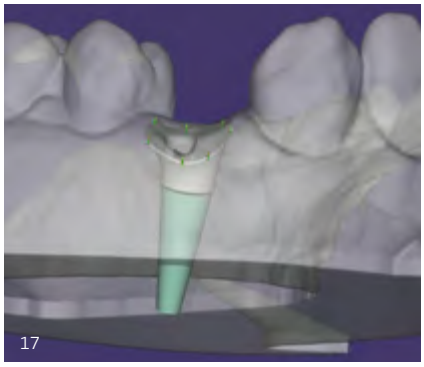

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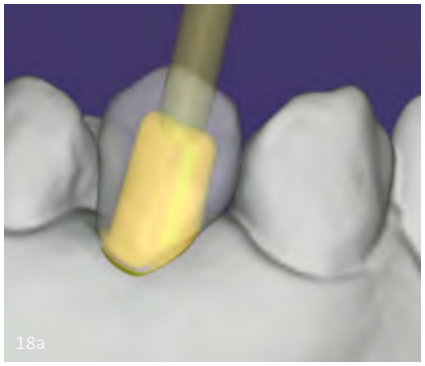


18a

18b

16 I Exporting the implant position to the CAD design software.
17 I Designing the emergence profile.
18a and b I CAD design of a definitive hybrid abutment.

19a

19b

19a and b I Milled hybrid titanium and anatomically reduced (vestibularly and incisally) zirconia crown.

20 I Ceramic veneer for later intraoral bonding.

the anatomically reduced zirconia crown from a zirconia blank (Figs. 19a and b). The latter was used for subsequent intraoral bonding of a ceramic veneer (Fig. 20). An alternative would have been a hybrid crown (Figs. 21a and b).

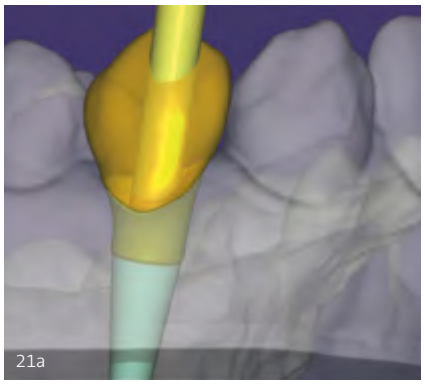
Once all preparations were completed, the implant was inserted and checked radiologically (Fig. 22). It was then restored provisionally and later definitively.

Hygiene requirements under scrutiny

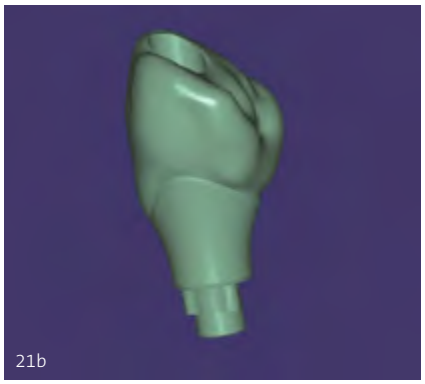
The reprocessing of medical devices of the "Critical B" category requires mechanical thermal cleaning and disinfection as well as sterilization of all parts in direct contact with human tissue. In Germany, a higher court has explicitly asserted the operator's liability for this procedure.

Drilling templates are generally disinfected with chlorhexidine digluconate or with ethanol. However, it should be remembered that hygienic cleaning can be impeded by pores and niches in the resin – this is as true of manually produced templates as of 3D-printed ones. If drilling templates produced and prepared in this way are used for immunosuppressed patients, nosocomial infections including sepsis can occur. Even in "regular" cases, an increased risk of periimplantitis [*Günay*, 1997; *Baron*, et al. 2001] or even the loss of an implant as a result of the proliferation of pathogens cannot be completely ruled out.

Heat-based methods for disinfection or sterilization must be ruled out, as 3D-printed or manually produced resin-based drilling templates must, according to many manufacturers, be protected from direct sunlight and higher temperatures in order to avoid physical deformation. For high-risk patients in particular, other, thermally stable materials and processes should be used in the production of drilling templates, allowing the latter to be heat-sterilized without residue, pursuant to applicable hygiene guidelines. For this purpose, dental manufacturers offer thermally and thus dimensionally stable 3D-printing materials that are certified class Ia medical devices (Fig. 15). Blanks made of PEEK or CoCr could be used for milling (CAM). To protect the patient's health, a manufacturing process should therefore be preferred that uses completely innocuous materials.



21a

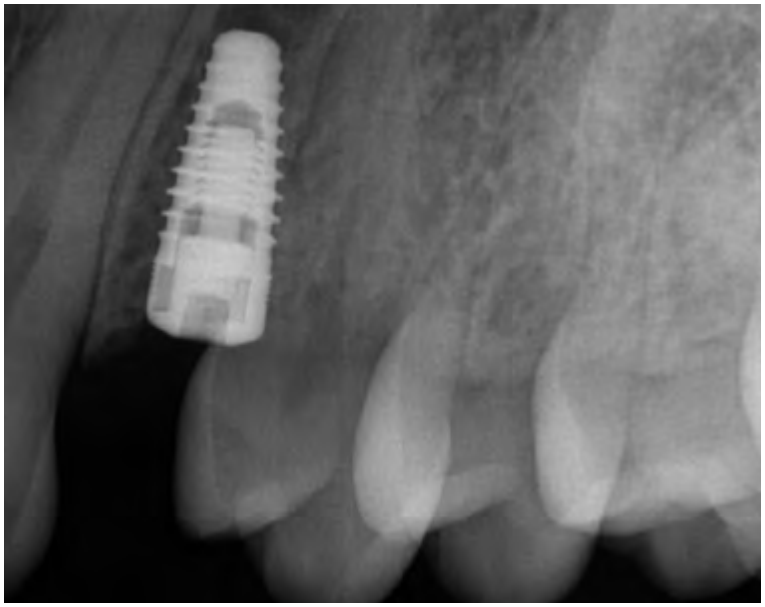


21b

21a and b I Alternative path (not followed here): Design of a hybrid crown with an insertion opening (a); fusion of the design data to form a hybrid crown that can be milled from PMMA blanks (b).

Conclusion

Three-dimensional backward planning using custom-made X-ray splints and drilling templates, while associated with higher costs, demonstrably reduces treatment risks. At the same time, it



22 I Control radiograph following implant placement (clinical images after insertion of the milled hybrid titanium crown are not available).

makes aesthetically and functionally planned restorations more predictable. Moreover, the greater up-front expenditure is in no way commensurate with the suffering and the loss of time and money caused by incorrectly planned or incorrectly positioned implants.

Interdisciplinary teamwork between dentists, oral surgeons and dental technicians as well as a coherent digital workflow facilitate treatment alternatives and objectives which can then be purposefully pursued as agreed with the patient. Workflows that include digital CAD design programs and implant planning systems such as Organical Dental Implant also significantly increase the safety of the procedure, which at the end of the process chain delivers precisely fitting, high-quality restorations.

The references are available at www.teamwork-media.de/literatur

Contact address

Dr André Hutsky
Ruwersteig 43
12681 Berlin
Germany
andre.hutsky@ruebeling-klar.de

Compromise in everyday practice

Patient wishes vs. treatment options

DR DANIEL NEUHAUSER, SAALFELDEN, AUSTRIA

"Dental pornography" – depictions of outstanding aesthetic rehabilitations of the most difficult situations – can be admired in many professional articles. In everyday practice, however, patients with a dominant desire for a harmonious aesthetic appearance of the dentition who therefore seek a high-quality restoration are rather the exception. Most patients present with their dentition in a functionally and aesthetically more or less desolate state. For whatever reason, they delay their visit to the dentist to the last moment – or beyond.

Introduction

It is difficult to convince patients with a problematic dentition of a the possibility of a permanent aesthetic and functional treatment. Attempts to convince demand a modicum of respect for the patient's own wishes. Patients often declare they would be satisfied with less than what the treatment team considers reasonable in a given situation – especially when considering their financial resources. Some patients will even insist on minimal therapy and continue to live with their intraoral deficits – until the next problem brings them back to the dental practice. The latter situation can even adversely affect the reputation of the treatment team: if deficits persist, this would seem to suggest a lack of competence on the part of the treatment providers rather than the patient's explicit desire to forego a recommended treatment.

The article presents three clinical cases to illustrate how differently the patient's needs can be and how a satisfactory solution can be found – sometimes more, sometimes less successfully – in the course of discussions between the patient and the treatment team. However, there is no universal rule for this. The chance of success will hinge on a dentist's chairside manners and personality. His or her empathy and ability to steer the conversation will determine which solution the patient ultimately decides to accept.

Legal aspects

The risks to be avoided when discussing patient wishes become obvious when we take a look at the prevailing legal situation. If patients expressly desire only minimal treatment, it will be the dentist's top priority to inform them of the circumstances and possible consequences for their intraoral status, which in certain cases may result in the dentist's refusal to treat. In Germany, the superior court (OLG) of Hamm has made it clear, in a recent ruling on the dentists' liability, that dentists must refuse treatment that violates medical standards. The patient's wishes cannot justify any mistreatment. According to the court [7], even providing detailed medical instructions on the possible consequences of the desired treatment does not legitimize a procedure that would amount to malpractice.

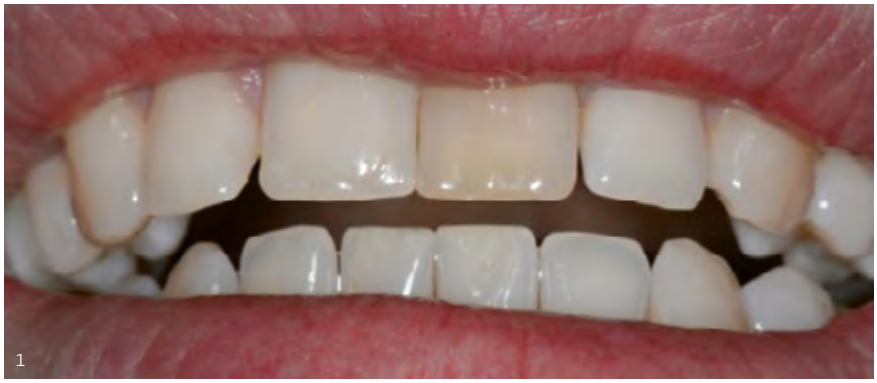
Another aspect is the extent to which the minimal therapy desired by the patient might result in an uncertain prognosis – and to what extent the practitioner might then be liable for the consequences, including possible damages. In addition, any medical consultation must assume that patients will generally be unaware of the various existing treatment options that might be more or less appropriate to their own case, differing not least in terms of the associated risks and benefits.

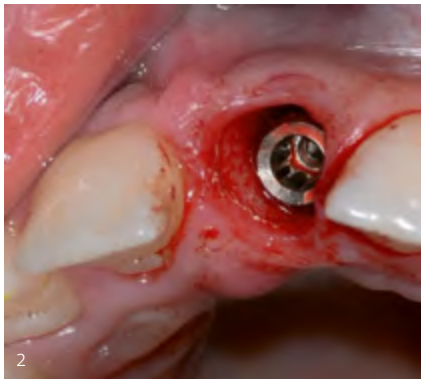
Participatory decision-making

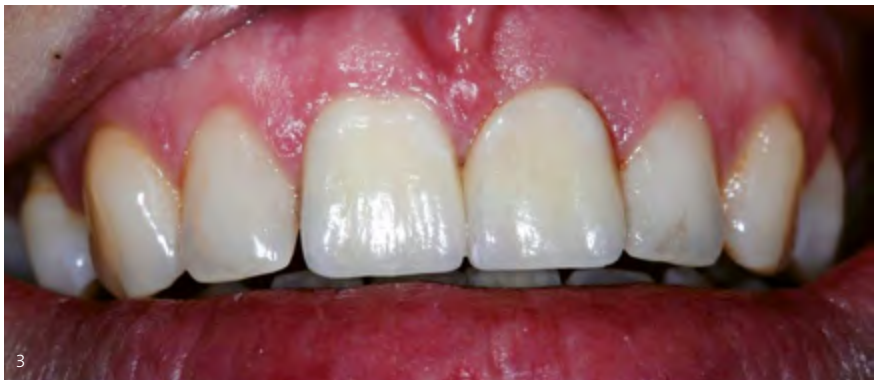
There are any number of reasons why some patients will only visit a dentist "at the last possible moment", why they accept minimal treatment and why they only agree to what is absolutely inevitable – often without even seriously considering the dentist's treatment suggestions. Limited financial resources, anxiety, concern about getting a more advanced treatment that is not actually necessary but more expensive – or simply the patient's acceptance or non-awareness of existing aesthetic deficits.

However, since there are usually several treatment options for a given situation, dentistry would seem predestined for joint decision-making. A therapeutic decision will therefore the reached after balancing aesthetic and functional aspects, dental and laboratory possibilities, including the ideas and financial resources of a patient.

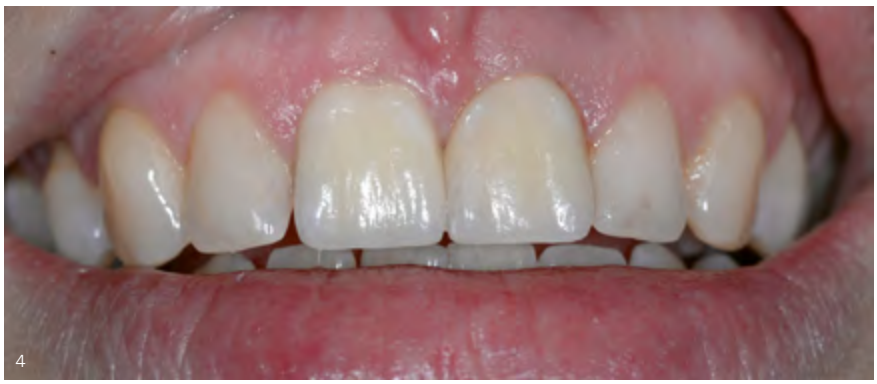
Achieving a shared decision-making process and patient consultations means for the treatment team to accept the patient's experiences, world views and values and to conduct discussions on the patient's own terms. This would have to

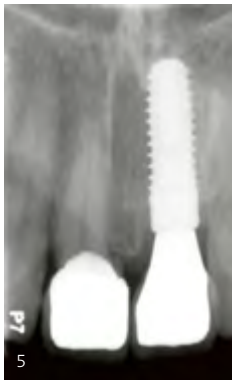






1 I Baseline situation.
2 I Placement of implant 21.
3 I Situation immediately after the insertion of the definitive crown.
4 I Clinical situation one year after implant placement.
5 I Radiological situation after implant placement.



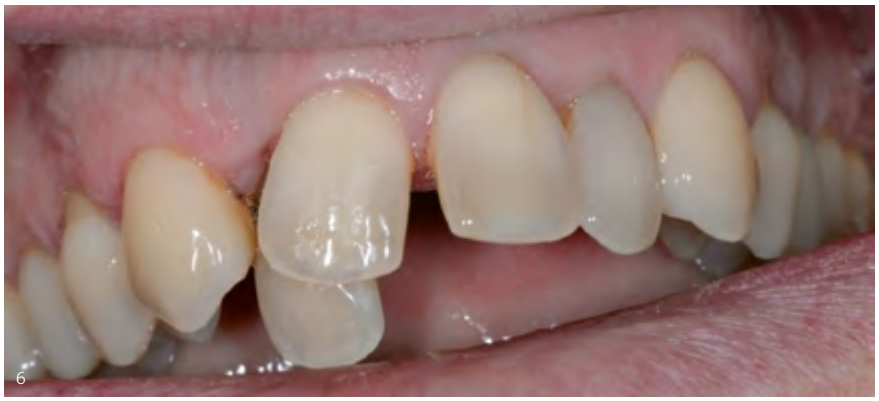


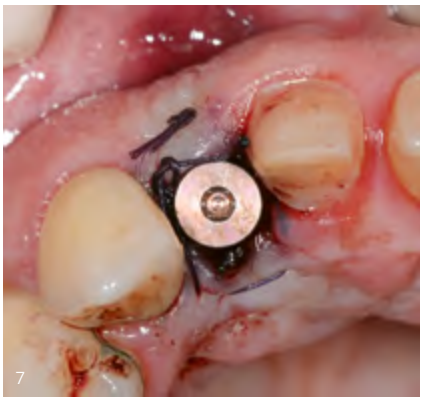
be based on information about the patient's socio-economic background (age, gender, occupation, social status, level of education). Patients who feel that they are being taken seriously by the dentist and their personal circumstances are being taken into account will be more open to discussions about treatment options. An informal and relaxed consultation environment can help achieve this. A separate consultation room or a small separate table in the treatment room would be ideal. Under no circumstances should patients lie flat on the treatment chair wearing a napkin during these consultations, because this would only make them feel overwhelmed and trigger a negative attitude.

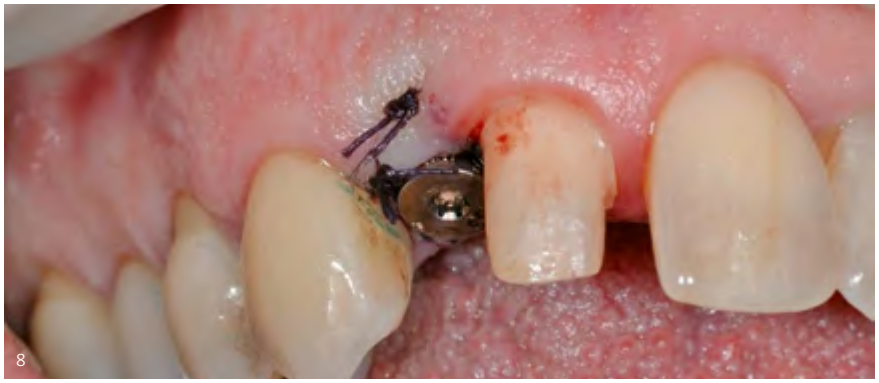
Three cases, three solutions

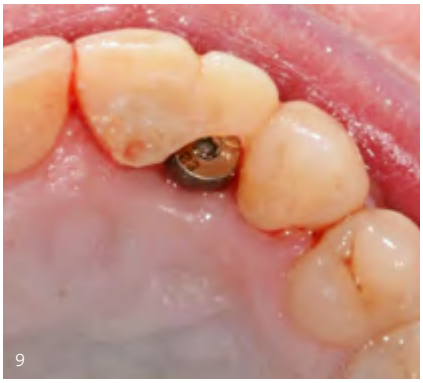
Case 1: Successful communication

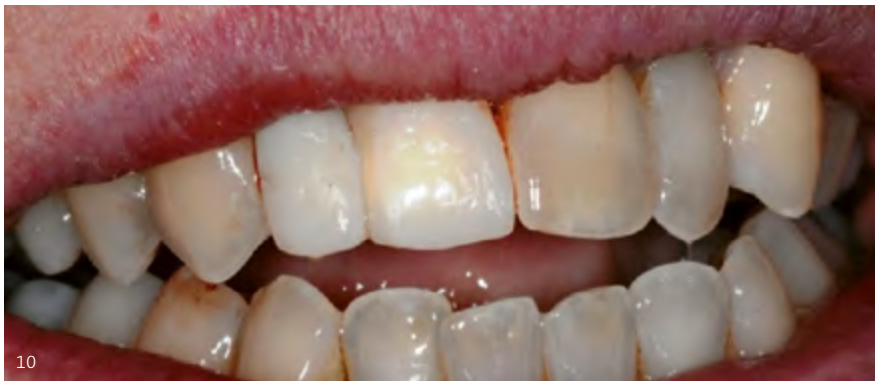
A female patient, 25 years of age, presented with a wish to have the aesthetics of her tooth 21, which exhibited post-traumatic discoloration, improved by bleaching or by veneers. However, the clinical and radiographic examination revealed that the anterior tooth was beyond further endodontic treatment and had to be extracted. The neighboring structures were intact. The possible treatment options were discussed with the – visibly disappointed – patient. A bridge restoration would have meant preparing the healthy adjacent teeth, a procedure with no professionally predictable result, especially in a patient this young. In addition, the patient still suffered from her experience, alio loco, of here inadequately treated anterior tooth trauma. Thus informed and sensitized, she opted for an implant-supported solution. After extraction and antibacterial photodynamic therapy (aDPT) with Helbo (bredent medical), an implant (blueSky, 4.5 × 14 mm, Bredent Medical) was placed slightly palatally, achieving primary stability. The buccal gap was filled with a mixture of bone replacement material (Ossceram Nano) and autologous bone. Tooth 21 and 11 were restored with ceramic crowns that appeared natural in shape and shade. One year after implant placement, the peri-implant hard and soft tissues were stable, and the appearance of the site was attractive (Figs. 1 to 5).

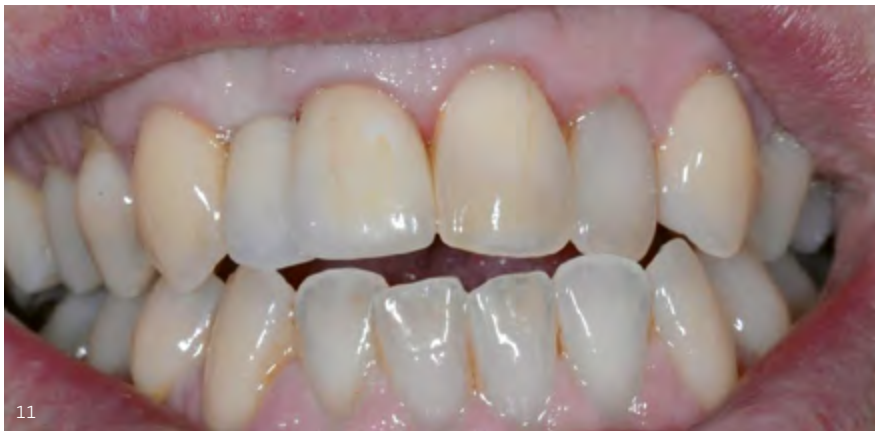


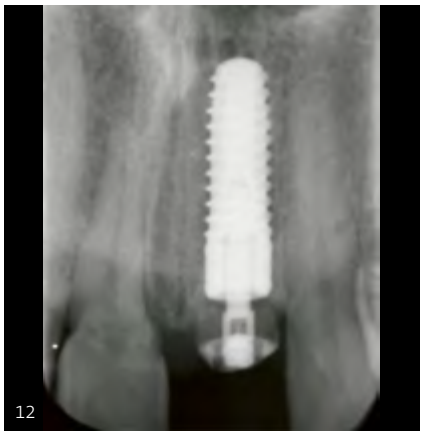












6 I Clinical baseline situation.
7 I Slightly palatal placement of the implant.
8 I Gingiva former at site 12 ortho actually prepared tooth 11.
9 I Provisional, palatal view.
10 I Provisional, frontal view.
11 I Definitive restoration.
12 I Radiological situation after completion.

Case 2: A start has been made

The patient worked in the restaurant business and therefore had constant direct contact with guests. Her maxillary anterior situation had deteriorated so much over time that she had finally had to accept the fact that she had to see her dentist. The course of orthodontic treatment previously performed alio loco had not yielded the expected result, which is why she was reluctant to accept the treatment suggestions she received. She ruled out a renewed fixed orthodontic treatment as a prosthetic pre-treatment, in close cooperation with a specialist, mainly because she would not accept the visible brackets. The compromise found after detailed discussion, which was acceptable from the dentist's point of view, was to replace tooth 12 with an implant (narrowSKY platform, 12 mm) as part of an immediate implant placement procedure. However, this required an orthoaxial preparation of tooth 11, which was actually still healthy, and restoring it with the crown. Implant 12 and tooth 11 were restored with a metal-ceramic crown. Further aesthetic corrections were initially rejected by the patient. However, there were already indications during the recall sessions that she had regained her trust thanks to a positive response to her changed appearance from her social environment, so she was opening up to the idea of additional treatment (Figs. 6 to 12).

Patient communication

The level of knowledge on the part of the dentist and patient is quintessentially asymmetrical. The information divide is considerable, and the dentist is challenged to overcome this problem during patient consultations. *Professor Dominik Groß* of the University Hospital of Aachen has called this the "power of experts, definition and control", all of which reside with the dentist. This asymmetry can be consolidated or its effects can be reduced by certain communicative patterns and mechanisms [5]. *Groß* makes a number of important suggestions for patient communication. For example, he considers it counterproductive to ask the patient to make immediate specific yes/no decisions when the patient has barely finished describing his or her complaints. Open questions, on the other hand, signal unconditional interest and are particularly suitable as an introduction to any consultation.

It is just as important to adapt one's language to the linguistic propensities of the patient. Overloading patients with detailed technical information or technical terms will trigger an inner defensive attitude. As a result, they will feel insufficiently informed, misunderstood and not taken seriously in their emotionality and their concerns, especially as the decision to be made concerned themselves. It is better to ask questions or respond to enquiries after a maximum of three case-related facts have been communicated. If the dentist paraphrases the patient's account in his or her own words, signals that the patient is being taken seriously. Anxious patients, on the other hand, are impaired in their perception and tend to misunderstand facts. A sensitive approach to their fears creates trust. For this reason, *Groß* advises against the use of potentially anxiety-inducing words such as "failure", "imponderables", "late effects" or "complications". If these words cannot be avoided, they should be followed by a thorough explanation. "Killer" phrases such as "Let that be my worry" or "killer" arguments such as "That has never happened here before " should not be part of the vocabulary of an empathic dentist. They stifle any further communication and signal that the patient is not being taken seriously – on the contrary, they constitute an act of shaming. The patient's non-verbal behaviour (gestures, facial expressions, silence) also indicates an emotional state; it signals how the information was received. Misjudging or ignoring such signals can severely disrupt or even prevent the establishment of a relationship of trust.

When further discussion seems pointless

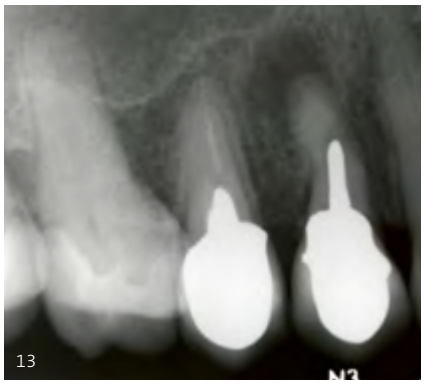
Although younger people with at least a high school education prefer shared decision-making, this does not necessarily imply a higher degree of self-confidence and an assertion of personal competence in medical matters. Conversely, it should be borne in mind that not every patient wants to make a shared decision. Older patients subscribing to more traditional role models will leave most treatment decisions to the doctor [1]. If such factors are not properly taken into account, there will be a risk of the consultation not leading to the desired result or of the patient sticking to a given view once it has been adopted.

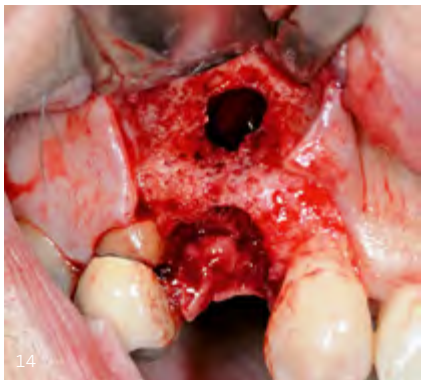
But even if the dentist tries to adapt to the patient at all three communication levels – factual, emotional and existential – there can be no guarantee that the patient will realize the risks and benefits of the respective treatment option and can be convinced to accept a specific treatment. While this decision by the patient must be respected, the risks and benefits of the patient's desired minimalist approach should be carefully weighed.

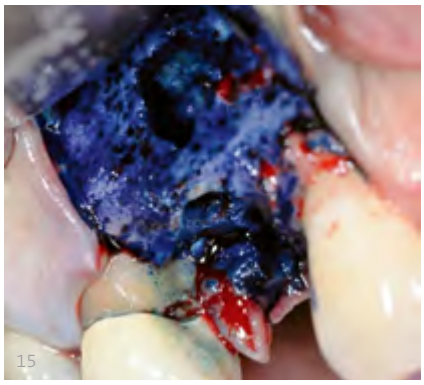
Case 3: Pushing the limits

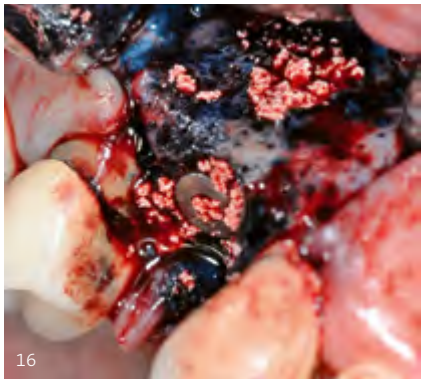
It was not the unfavourable aesthetics of tooth 15 but the severe pain in tooth 14 that made this patient visit the practice. The diagnosis showed an endodontically treated tooth 14 with apical osteitis that was not salvageable. A bridge was out of the question, because this would have meant unnecessarily preparing the intact tooth 13. The stability of a unilaterally retained bridge, could not be reliably predicted. Therefore, an implant-supported restoration at site 14 and the renewal of the less appealing restoration on tooth 15 were suggested. Alternative options were leaving the gap or visiting another dentist. Faced with this choice, the patient opted for immediate implant placement at site 14, but without simultaneous replacement of crown 15. The patient did not take that decision on cost grounds. A new crown would be, as she argued, "the equivalent of another diving holiday, and my preference is for that". But even such a line of arguments must be respected. In such cases, it is important to instill or increase patient confidence in the dentist with a perfect "minimal treatment" to win them over for potential future treatment.

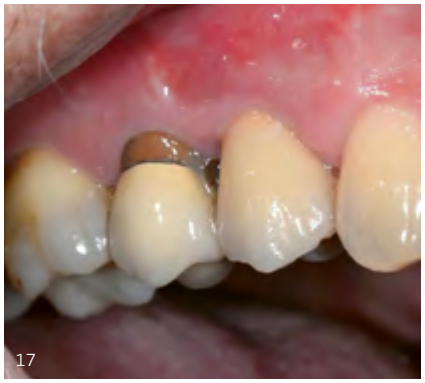
After careful curettage, the surgical site was decontaminated using the Helbo method [6]. In order to fill the defect and minimize the extraction-related



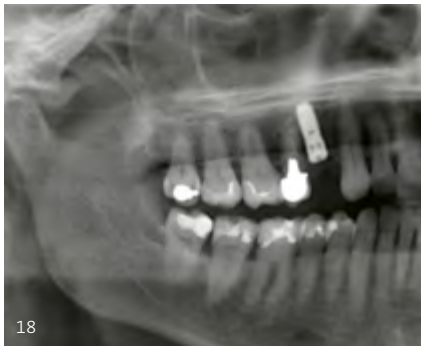


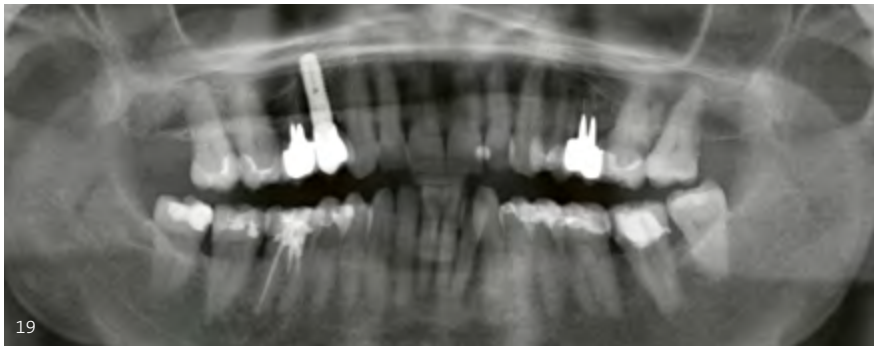






13 I Baseline radiograph of teeth 14 and 15.
14 I Clinical view of the surgical site with apical defect.
15 and 16 I Decontamination with Helbo and augmentation of the defect (Osscream Nano).
17 I Clinical situation after the treatment.
18 I Panoramic radiograph immediately after implant placement.
19 I Follow-up radiograph some time after implant placement.





bone loss [1, 2], bone augmentation was performed during implant placement (Osscream Nano). The implant (blueSKY 4.5 × 14 mm, regular platform) was left to submerged healing due to a primary stability of 25 Ncm. A metal-ceramic crown was delivered as the final restoration (Figs. 13 to 19).

Conclusion

The ethical-empathetic conduct of the consultation outlined above is suitable to promote a shared decision process to compensate for the fundamental asymmetry between the dentist and the patient [4]. Providing patients with mutually satisfactory aesthetics, however, may take years of patient education and several treatment increments. Successful patient communication may also imply that while no further treatment is to be carried out at the moment, the foundation stone is laid for subsequent treatment, such as implant therapy. The important thing is to act authentically. The aim must be to win the patient's trust to the extent that all suspicion of the treatment proposals disappears in favor of acceptance of a professional suggestion of appropriate care. The result will be a lasting bond between the patient and the practice. In this sense, shared decision-making is not a short-term one-off activity but should be regarded "as a long-term cooperative relationship between the doctor and the patient" [3]. And if this procedure is not effective, the only thing left to do is to wait patiently for the next "external" reason – such as information from the patient's social, personal or professional environment – that will induce the patient to return to the practice.

Acknowledgements: The laboratory work was performed by dental technician *Walter Kruckenhauser* (Oberau, Wildschönau, Tyrol, Austria).

The references are available at www.teamwork-media.de/literatur

Contact address

Dr Daniel Neuhauser
Ramseiderstraße 22
5760 Saalfelden am Steinernen Meer
Austria
office@zahnarztneuhauser.at

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Five-year clinical retrospective study

Survival and treatment success of full-arch implant-supported PEEK prostheses

DR BERND SIEWERT, POZUELO DE ALARCÓN, SPAIN

Over the last two decades, edentulous patients have increasingly been treated with screw-retained full-arch implant-supported prostheses [1,2]. Traditionally, these prostheses have been fabricated with rigid metal frameworks or, more recently, rigid zirconia frameworks [3]. The present study aimed to evaluate the survival rate of implant-supported full-arch prostheses with polyether ether ketone (PEEK) frameworks, to specify the kind of problems that occurred in the observation time, to assess survival rates, to investigate the behaviour of peri-implant bone and to quantify the oral health-related quality of life (OHRQoL) and patient satisfaction.

Rigid materials do not prevent the implant and other parts of the design, such as screws and other fragile parts, from local occlusal overload and may cause damage or fracture [4] and thereby impair the quality of life of bruxism patients. The established treatment solutions – (a) metal-ceramics; (b) all-zirconia; (c) metal-reinforced acrylic implant-supported bridges – still exhibit clinical problems [5]. Certain materials can act as occlusal shock absorbers [6]. The question was whether a high-performance polymer such as polyether ether ketone (PEEK) might be an improved alternative to the established solutions. Additionally, given increasing patient and clinician demand for metal-free restorations supported by zirconia implants, polyether ether ketone (PEEK) is an alternative to metal in these cases.

Implantable PEEK polymer (Peek-Optima; Invibio, Thornton Cleveleys, UK) has been used clinically for 15 years. With more than five million cases, implanted PEEK devices have become an industry standard across a wide range of medical applications, including spinal fusion, due to their excellent mechanical properties, strength-to-weight ratios and chemical stability [7].

PEEK has had some use in dentistry over the last decade, mainly in the form of temporary abutments and healing caps, but the material has remained somewhat underutilized [8]. This material is extremely interesting for use as frameworks for full-arch, implant-supported prostheses due to its proven biocompatibility and resilience [9]. The present study investigated the clinical outcome of using PEEK polymer as a framework material in full-arch, implant-supported prostheses.

Materials and methods

Ethics

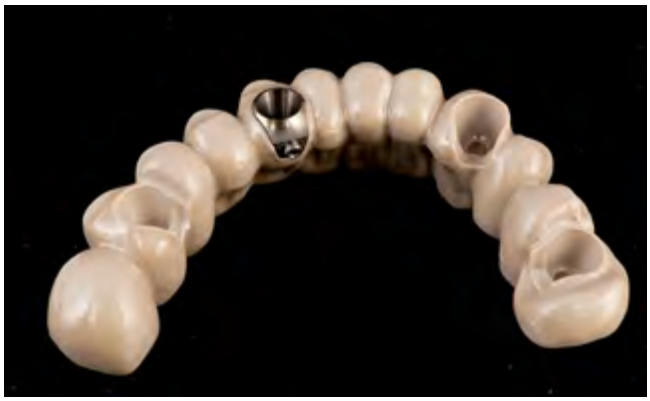
This report is a retrospective review of one clinician's private practice of which the clinician was the Clinical Director. Consent was obtained from all patients included in the study.

Patient selection

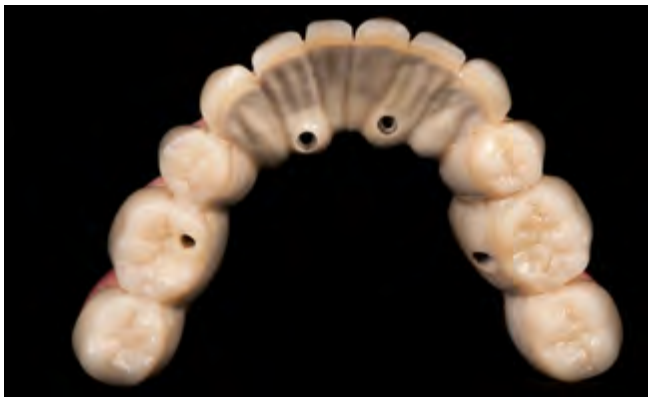
A retrospective data review of dental records at the private clinic was conducted for patients treated between March 2008 and October 2016. The patient included were single-arch edentulous patients treated with PEEK implant-supported full-arch prostheses over 18 years who were willing to return for follow-up assessments. 2 patients who met these criteria could not be included as they had died of causes unrelated to their dental treatment. 20 patients were deemed eligible to be included in the analysis.

Implants and prostheses

All patients were treated with full-arch implant-supported screw-retained (horizontal (Fig. 1) or occlusally retained (Fig. 2) bridges with PEEK frameworks. The PEEK surface was sandblasted with 80 µm aluminium oxide at a pressure of 2,5 bar and treated with a Primer (VisioLink; Bredent, Senden, Germany). The framework was then veneered with prefabricated multilayer PMMA composite veneers (novo.lign; Bredent) using a



1 I Laboratory intaglio view of a PEEK framework with one of the four horizontal screw titanium abutments in place.



2 I Laboratory occlusal view of a veneered PEEK framework with four occlusal screws.

special PEEK Primer (visio.link; Bredent) and a dual-curing resin (combo.lign; Bredent).

In total, 92 titanium implants were placed, 80 in the maxilla and 12 in the mandible. The implants used were: 10 × BEGO Semados RS implants (BEGO, Bremen, Germany); 56 × blueSKY implants (bredent medical; Senden, Germany); 12 × MPI Excellence implants ASTRA TECH type internal connection (Medical Precision Implants, Madrid, Spain); 4 × MPI Excellence implants with a Brånemark-type external connection (Medical Precision Implants); 10 × PITT-EASY implants (Sybron Dental Specialities, Bremen, Germany). The surgical procedures used to place the implants and deliver the prostheses were performed by *Dr Siewert* in accordance with the manufacturer's recommendations. 14 patients received 67 implants placed following a delayed approach with an observed minimum healing period of four months prior to loading with the definitive PEEK prostheses. The remaining 25 implants of 6 patients were immediately loaded with ten-unit provisional PMMA screw-retained prostheses with glued-in titanium abutments. The definitive PEEK bridge was delivered after a minimum of five months.

None of the dentures faced a complete denture in the antagonist jaw. One patient wore an implant/bar-retained overdenture, two patients had natural teeth with a removable clasp-retained denture in the molar region, two patients had a cemented metal-ceramic restoration from canine to canine with a removable part attached in the molar region, one patient wore a full-arch metal-ceramic restoration, two patients had their natural dentition and the remaining twelve patients wore single or crown or short ceramic bridges restorations on natural teeth or implants. Figures 3 to 7 demonstrate a representative case over the observation period.

Patient evaluation

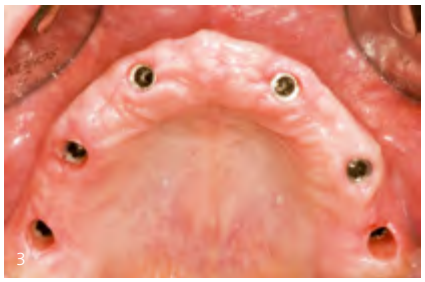
All patients had been followed up by *Dr Siewert* after prosthetic delivery. All patients were asked to return to the clinic for a further assessment between October and December 2016. 18 of the 20 patients returned for this assessment. For the 2 subjects who did not return, the data from their previous follow-up assessment was used in the analysis. 8 patients had to be treated for failure of metal-ceramic restorations on natural teeth or implants due to fractures of the ceramic, the metal framework, natural roots, or fracture or loss of implants. These patients were considered a special risk group due to their bruxism.

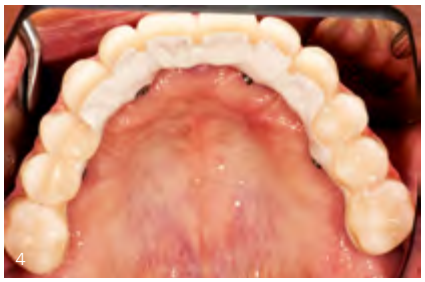
Clinical and radiological assessments

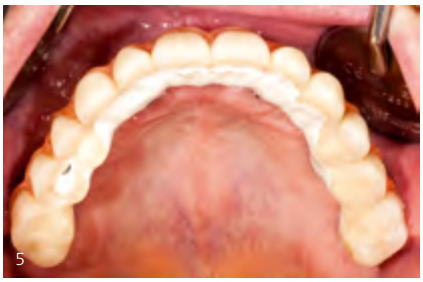
For bone-loss assessment, each patient had extraoral radiographic examinations using an Instrumentarium OP100 D Panoramic X Ray orthopantomograph (KaVo Dental) to measure their marginal bone loss. The panoramic radiographs taken on the day the restorations were delivered was considered as the baseline radiograph of each patient. A panoramic x-ray was taken of each patient included in the study at the end of the observation period. As the study is a clinical retrospective one, the radiographs were only standardized to the extent that they were done using the same machine operated by the same person and following a strict positioning protocol. Digital data was then analyzed with the dental imaging software Cliniview (Kavo Dental, Biberach, Germany) using the following protocol: Each image was optimized by adjusting brightness, contrast and gamma. Each image was then calibrated prior to the length measurements of the mesial and distal aspect (Figs. 8a and 8b). To improve measurement accuracy, the region to be measured was adequately amplified. The distance between the implant shoulder line and the crestal bone line was measured in the distal and mesial sides of the implant.

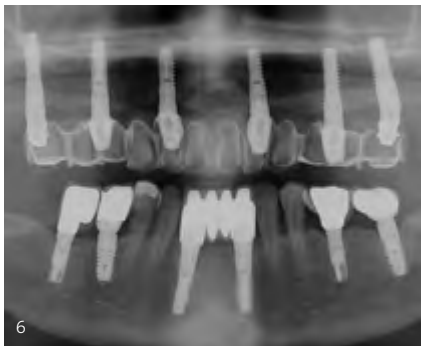
At the recall appointments, the clinical examination also assessed the peri-implant tissue health, measuring pocket depths and bleeding on probing. Each patient had a clinical examination to screen for peri-implantitis with the implants being evaluated as follows: cumulative bone loss > 2 mm, depth probing depths > 4 mm with simultaneous bleeding and/or suppuration, implant mobility, and crater-like bone defects [10–15].

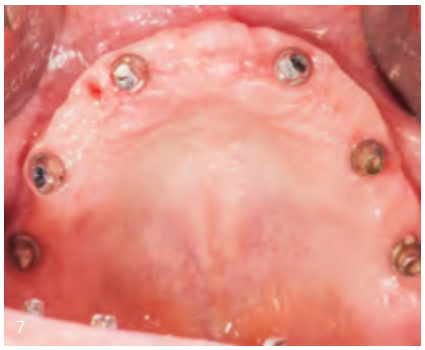
Survival of the implant and prostheses was also evaluated, where failure was defined as "an implant/prosthesis that had to be removed for any reason". Information regarding any adverse events, including conditions at onset and











3 I Initial situation prior to prosthesis delivery, occlusal view (June 2008).
4 I Full-arch screw-retained prosthesis with PEEK framework in place, occlusal view (June 2008).
5 I The same prothesis at the recall appointment eight years later (October 2016).
6 I Panoramic radiograph at the recall appointment eight years after insertion (October 2016).
7 I Situation with prothesis removed at the recall appointment eight years after insertion (October 2016).

any measures taken was noted. Adverse events did not always result in removal of the restoration. Each patient was also examined with respect to the appearance of the restorations and any abutment- and attachment-related component complications.

At the end of the observation period (end of 2016), patients were asked to complete the Oral Health Impact Profile survey in a validated Spanish version (OHIP-14Sp) [16], scored using an adaptation of the Likert scale (0 = least impact/never, 4 = highest impact/always). Separately, all 20 patients were asked to rate their satisfaction on a scale from 1 to 10 (1 = least satisfaction/extremely dissatisfied, 10 = greatest satisfaction/extremely satisfied).

Results

Patient details

The average follow-up post-implantation was 77 months, with a range of 18 to 105 months. The average follow-up post-prosthetic placement was 56 months (4 years and 8 months), with a range of 14 to 105 months (8 years and 9 months).

Primary outcomes: implant and prosthetic survival

The implant survival rate was high (99 %), with 1 implant out of 92 failing after 7 years in service, observed in a patient with a clinical history of severe periodontitis and the extraction of all remaining teeth prior to implantation as well as cancer treatment.

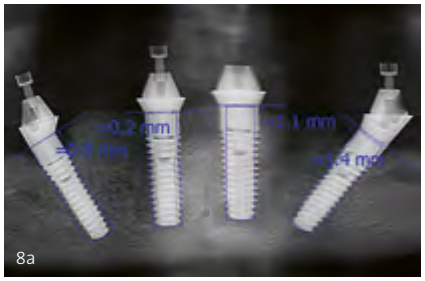
The survival rate of the PEEK prostheses was high at (100 %), with none of the 20 prostheses failing over the average review period of 56 (14 – 105) months.

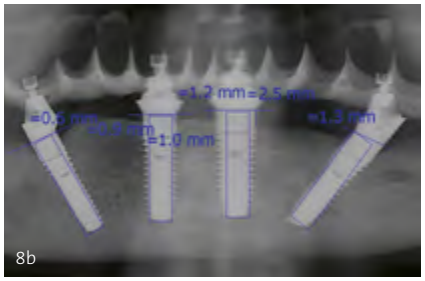
Clinical and Radiological Assessments

Bone loss was evaluated at a number of time points following the placement of the PEEK prostheses. Bone loss after an average of 54 months (4 years and 6 months) was 0.2 ± 1.0 mm on the mesial aspect and 0.3 ± 0.8 mm on the distal aspect.

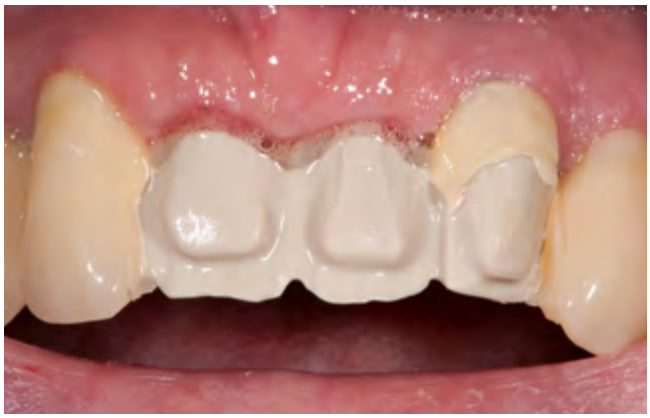
The peri-implantitis incidence was low (1 %). Peri-implantitis was observed around one implant, with the remaining 91 implants showing no indication of peri-implantitis during the follow-up period.

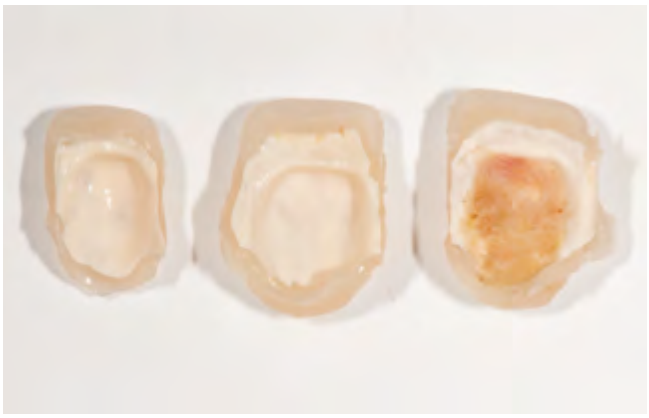
No prosthetic complications such as abutment corrosion, abutment de-cementation or screw loosening were observed. Veneer chipping occurred in five cases and could be divided into two groups. The first group included 2 cases of early chipping within the first month after bridge placement, due to a mistake in the bonding process (Figs. 9a and 9b). Following repair in the dental laboratory, no more instances of this kind of chipping were observed. The second group included are 3 cases of so-called late chipping, single-veneer fractures after





8 I Representative example case for the measurement protocol of the mesial and distal peri-implant bone levels in detail of the panoramic radiography I a: Initial reference when the definitive restoration was installed after calibration process (September 2013) I b: Final reference at the end of the observation period after calibration process (November 2016).



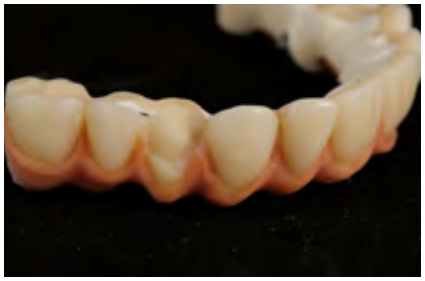


9a & b I Examples of early veneer chipping (within the first month of placement), due to bonding process in the laboratory.

several years of use, due to changes in the occlusal pattern (Fig. 10); it only occurred in the subgroup of bruxers, and all 3 cases could be repaired at chairside in the dental office.

18 patients completed the OHIP-14 questionnaire between October and December 2016.

The maximum possible score for the OHIP-14 is 56 points, representing the worst possible OHRQoL result, and the minimum score is 0 points, representing the best possible OHRQoL result. The mean total OHIP-14 score was 3.1 ± 3.3 points after an average follow-up of 58 months (4 years and 10 months) with a range of 0 to 12 points. In addition, 27.8 % of patients exhibited a score of 0 and 66.7 % of patients one of 3 or less. Apart from the OHIP-14 questionnaire, all 20 patients in the study were interviewed and asked to score patient satisfaction on the 1–10 scale. Patients rated patient satisfaction high, with a mean score of 9.3 ± 0.9.



10 I Examples of late veneer chipping, six years after placement, caused by occlusal abrasion of the PMMA veneers.

Bruxism patients

A subset of 8 patients with bruxism (defined as patients who grind, gnash or clench their teeth) was also identified with an average prosthetic treatment time of 51 months. All patients completed the OHIP-14 questionnaire; the mean total OHIP-14 score for this group was also low at 3.9 ± 3.4. The 8 bruxism patients rated their satisfaction at 9.4 on the 1–10 scale. The bruxism patients demonstrated implant and prostheses survival rates of 100 %, a low rate of bone loss (0.1 ± 0.8 mm on the mesial aspect and 0.3 ± 0.8 on the distal aspect), and no incidence of peri-implantitis.

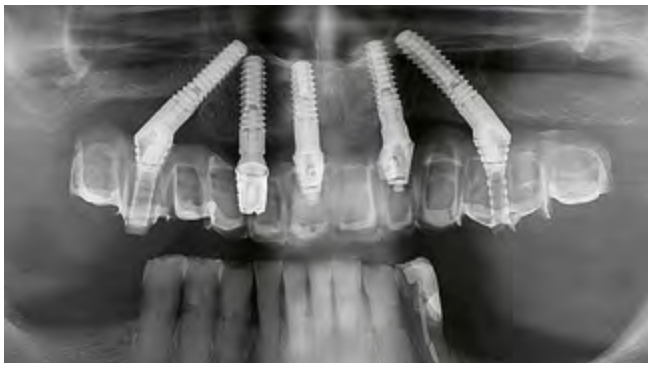
Discussion

Several studies have reviewed implant and prostheses survival rates of metal implant-supported fixed complete full-arch dental prostheses (IFCDPs). The reported implant survival at 5 years is high, at 94.3 % [17], and the correspondent full-arch prostheses survival rate is also high, at 91.4 % [18,19]. For the 20 patients followed in this study, the implant survival rate was 99 % and the prostheses survival rate was 100 %. This improved survival of the implants and the associated prostheses might be due to the increased flexibility of the PEEK material (lower elastic modulus than titanium [20]), resulting in improved shock absorption by the prostheses [21,22]. The improved shock absorption may shield some of the chewing forces, improving patient comfort and potentially helping to preserve the bone around the implants.

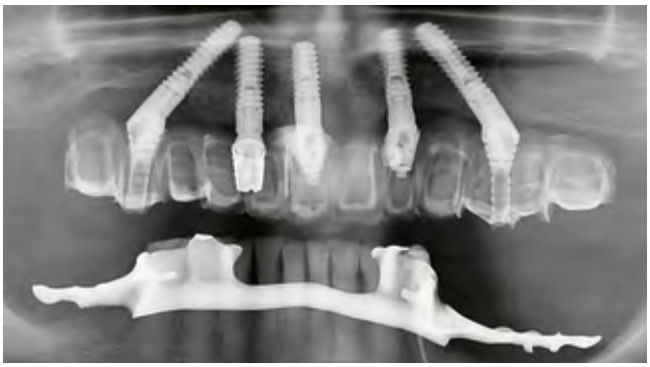
The rate of bone loss around implants has been reported as around 0.19 mm per year [23]. After a five-year period, it has been reported average marginal bone loss could reach approximately 1.5 mm [24]. In the present study, much less bone loss was observed (0.2 ± 1.0 mm on the mesial aspect and 0.3 ± 0.8 mm on the distal aspect), which could be related to the shock absorption benefits conveyed by the PEEK prostheses, shielding heavy loads and potentially preserving the bone. Additionally, it should be considered that the modulus of elasticity of the veneered PEEK framework bridges is more likely to guarantee a 100 % passive fit than rigid structures, because minor intolerances are compensated.

Peri-implantitis is an infectious condition of the tissues around osseointegrated implants with loss of supporting bone and clinical signs of inflammation. The prevalence of peri-implantitis has been stated to be present in about 10 per cent of implants [17,25]. The low incidence of peri-implantitis observed in this study (1.1 %) could be related to the good bone preservation around the implants, which again might be derived from the improved shock absorption behaviour of the PEEK material. Another element that could contribute to the low incidence of periimplantitis is the metal-free nature of PEEK prostheses.

Concerns about corrosion and the release of metal ions resulting from galvanic coupling of the metallic prostheses with the metallic implant system have been raised [26,27], and in the present



11a I Panoramic radiography of a patient with bruxism at four months follow-up after prosthesis placement.



11b I Panoramic radiography of the same patient at 70 after prosthesis placement.

situation this is mitigated by the usage of a metal-free prosthesis. The natural inertness and biocompatibility of the PEEK material [7], combined with the flexibility of the material allowing a more forgiving passive fit, could also help maintain a long-term healthy tissue.

One case of peri-implantitis was observed in a patient with an early diagnosis of severe periodontitis. Although just one implant out of a total of four implants in the mandible of this patient was affected it has been suggested that patients with a diagnosis of periodontitis could be at greater risk of developing peri-implantitis [28–30].

The patient's OHRQoL is an outcome believed to be highly favourably affected after improving the shock absorption behaviour of the implant/prosthetic system [31]. The OHIP-14 questionnaires of 18 patients reported very low average results, with 94 % of patients reporting never or hardly ever having had a problem with pain, and 89 % of patients reporting never or hardly ever having had a problem with sensitivity or discomfort due to dentition-related issues. The OHIP-14 observations were in line with patient satisfaction reported by all 20 patients, who were extremely satisfied at a level of 9.3 on the 1 – 10 scale. Similar OHIP-14 studies conducted with implant-supported full-arch prostheses have reported around 75 % of patients scoring at the never/hardly never/extremely satisfied level [32]. As with the clinical outcomes, patient satisfaction and comfort seemed to be improved by the use of the PEEK prostheses.

The impact that PEEK as a prosthetic material might have in reducing the patients' pain and discomfort becomes even more relevant for patients affected by parafunction (bruxism and pressing). Tooth pressing, also called centric bruxism, which could affect as much as 20 % of patients, has been suggested to cause excessive occlusal load on implants and prostheses, resulting in excessive bone loss around the implants, implant failure and even damaged prostheses [33,34].

Of the 20 patients followed, a subset of eight patients affected by parafunctions was identified. Parafunction patients' OHIP-14 scores remained low at 3.9, with these patients ranking satisfaction high at 9.4 on the 1 – 10 scale. The parafunction patients with an average prostheses treatment time of 51 months demonstrated 100 % implant and prosthetic survival rates, a low rate of bone loss (Figs. 11a and b) and no incidence of peri-implantitis. The follow-up examinations showed that the antagonist situation remained stable over the years, with no further tooth loss, no periodontitis and no bone loss.

No differences were observed in terms of the quality of life and clinical outcome assessed between the subset of parafunction patients and other patients. This seems to indicate that the benefits derived from a prosthesis with greater shock-absorbing capacity can be felt even by patients with parafunctions, substantially improving their quality of life in comparison with the more rigid metal-based prostheses.

Conclusion

Within the limitations of this study, patients treated with PEEK full-arch implant-supported prostheses showed high implant and prostheses survival rates with low peri-implant bone loss and a low incidence of peri-implantitis. OHRQoL scores and patient satisfaction were found to be extremely satisfactory, even in bruxism patients. Veneer chipping presented the only prosthetic complication, indicating that the veneers must be connected accurately and precisely. On the other hand, the incidence of chipping in bruxers was lower than reported in the literature. One advantage is that the material permits easy repairs even at chairside.

It is suggested that the observed improvements in OHRQoL and clinical outcomes could be related to the enhancement in shock absorption provided by the PEEK prostheses, which might help preserve the bone around the implants and reduce patient pain and discomfort even in the case of patients affected by bruxism. A prospective study with a larger number of patients would be beneficial.

The references are available at www.teamwork-media.de/literatur

Contact address

Dr Bernd Siewert
Calle Aquilón, 2
Local 7/8
28223 Pozuelo de Alarcón
Spain
siewert@dental-med.com

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Management of a severely atrophied maxilla with short implants and sandwich technique bone grafting

More bone volume – less morbidity

EDUARDO ANITUA DDS, MD, PHD[1, 2, 3]

The continuous advances in dentistry and oral surgery have made it possible to rehabilitate even many partially and completely edentulous patients whose residual bone volume is not sufficient to insert implants directly. In these cases, many different techniques are used to enlarge the bone volume.

Particulate bone grafts, guided bone regeneration, autologous and allogeneic block grafts, and – in some cases – distraction osteogenesis have been described [1–3]. This case report presents a special approach of bone grafting with autologous material.

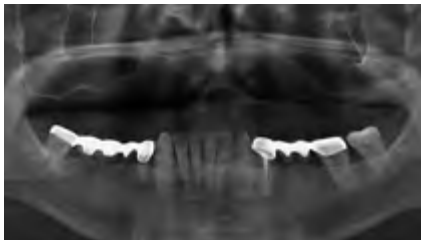
It is well known that autologous bone-block grafts are associated with a variable bone resorption. According to the literature, sites augmented with mandibular bone blocks have a resorption rate between 5 and 28 per cent [7–11]. Autologous bone is still considered the most predictable bone augmentation material, even if often associated with significant patient morbidity [4, 5]. To reduce this morbidity, autologous bone-block grafting has been slightly modified [6], e.g. by using the lateral wall of the maxillary sinus in combination with particulate bone graft to obtain a "sandwich". This procedure has been associated with less donor-site morbidity and predictable bone augmentation [6, 7]. The present case report describes the use of the lateral wall of the maxillary sinus for horizontal bone augmentation.

Material and methods

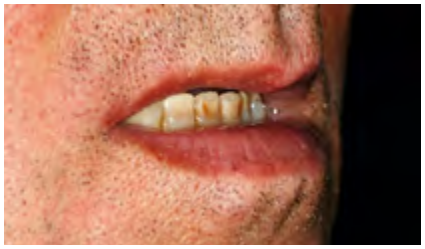
A 58-year-old male patient presented for the rehabilitation of his completely edentulous maxilla. The initial panoramic radiograph showed significant vertical and horizontal bone atrophy (Fig. 1). The extraoral exploration without the removable prosthesis showed a class III skeletal alignment for the maxilla and the mandible (Figs. 2 and 3). The cone-beam computed tomography (CBCT) confirmed the severe vertical and horizontal bone atrophy.

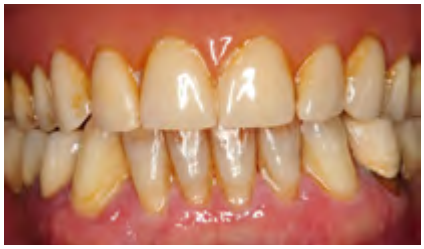
The combined bone atrophy led us to plan the following procedure: sinus elevation in the first quadrant, where the height of the residual alveolar bone was 2 mm, and the use of short implants in the second quadrant, where the height of the residual alveolar bone was 6 mm; horizontal bone augmentation with the lateral sinus wall was planned for the first quadrant (Figs. 4 to 6).

To measure the width of the residual alveolar ridge, the CBCT scan was imported into visualizing software (BTI scan IV; BTI Biotechnology Institute, Vitoria, Spain). CBCT scans were obtained with a Sirona Galileos 3D scanner (Dentsply Sirona, Bensheim, Germany) using a standardized positioning protocol (the occlusal plane parallel to the ground and the midsagittal plane perpendicular to the ground) and a radiation protocol of 42 mA and 80 kV. The scan was obtained before surgery (T1) and after horizontal bone augmentation (before implant insertion) (T2).



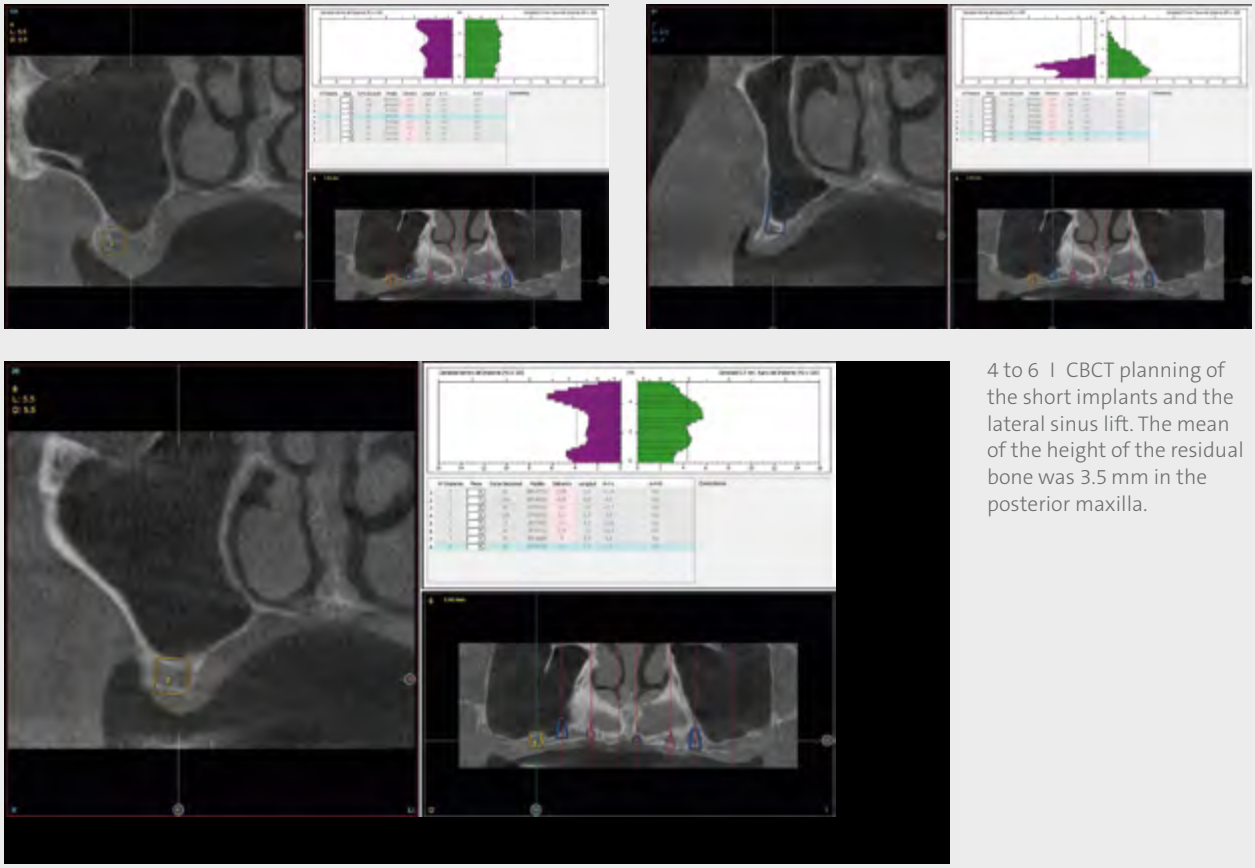
1 I Initial panoramic radiograph of the patient.



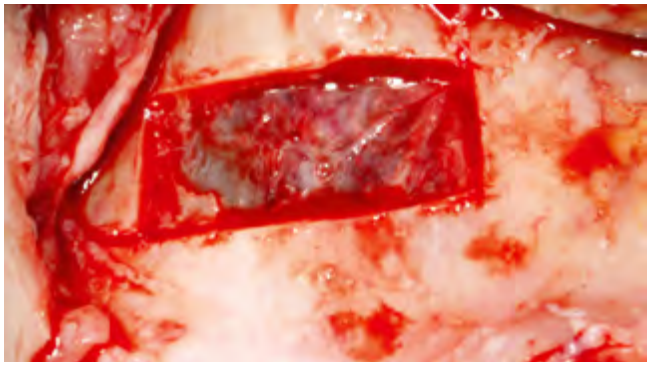


2 and 3 I Extraoral view of the patient. Intraoral baseline situation of the patient with the conventional prosthesis.

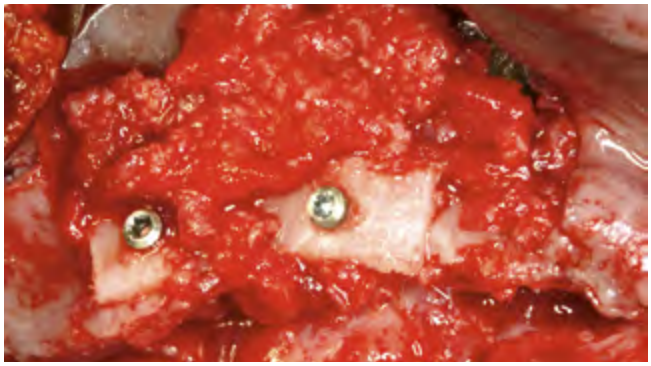
[1] Private practice in oral implantology, Eduardo Anitua Foundation, Vitoria, Spain
[2] Clinical researcher, Eduardo Anitua Foundation, Vitoria, Spain
[3] University Institute for Regenerative Medicine and Oral Implantology – UIRMI (UPV/EHU-Fundación Eduardo Anitua), Vitoria, Spain



4 to 6 I CBCT planning of the short implants and the lateral sinus lift. The mean of the height of the residual bone was 3.5 mm in the posterior maxilla.



7 I The lateral wall of the sinus is collected using ultrasonic surgery ...

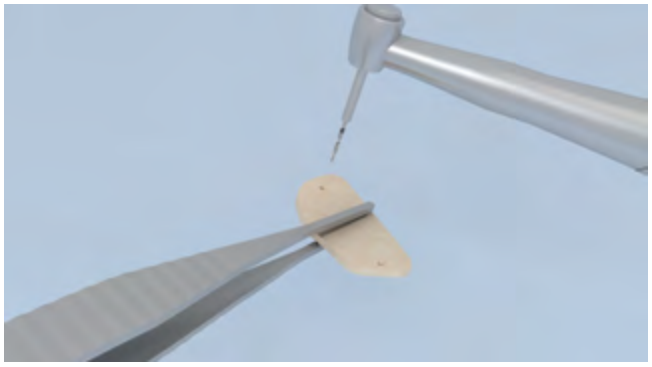


8 I ... and used as a membrane to cover the particulate bone. It is secured with osteosynthesis screws.

In the surgical phase, the patient received 2 g of amoxicillin one hour before the intervention in conjunction with 1 g of acetaminophen preoperatively. Plasma rich in growth factors (PRGF-Endoret, BTI Biotechnology Institute, Vitoria, Spain) was prepared from citrated whole blood in compliance with the instructions of the manufacturer. According to this protocol, plasma column was separated into fraction 2 (F2) that contains the 2 ml of plasma richest in platelets and located just above the buffy coat, and into fraction 1 (F1) that contains the rest of plasma column. Platelet activation was realized by the addition of 20 µl of 10 % calcium chloride per ml of plasma [8]. In the first quadrant, lateral sinus floor augmentation was carried out by piezoelectric surgery [9] (Fig. 7).

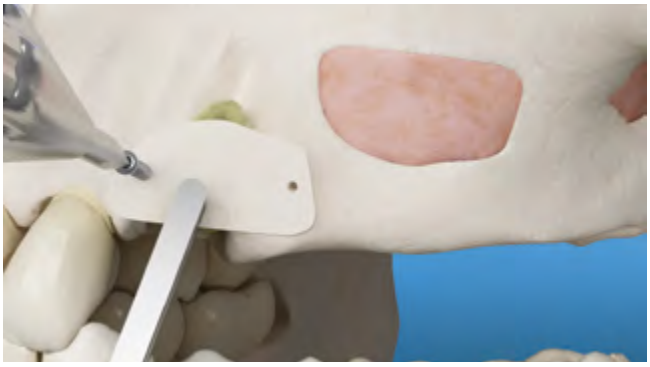
The lateral wall of the sinus was conserved in PRGF-Endoret (fraction 2 without activation) and used in a second surgical phase in conjunction with a particulate bone graft to realize the sandwich technique. In this case, we used the particulate bone obtained by the preparation of future sites of the implants in the lower jaw to fill the space between the wall of the sinus and the primary bone. This bone was embedded in PRGF-Endoret (fraction 2).

Once the clot was formed agglutinating the bone particles, it was positioned in the receptor area. The lateral wall of the sinus was then used to cover all the graft of particulate bone (as a bone membrane) and fixed with osteosynthesis screws (Fig. 8). The spaces between

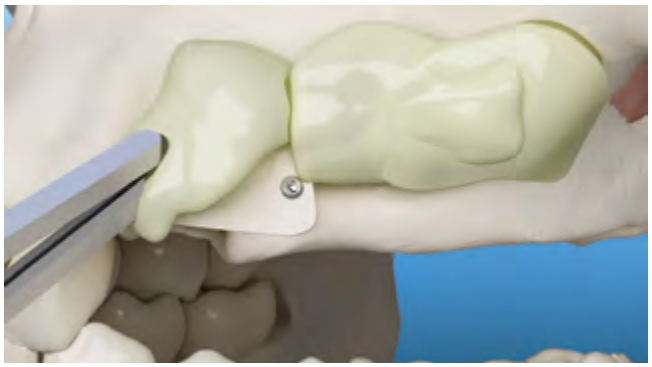


9 I Drilling the positions of osteosynthesis screws.

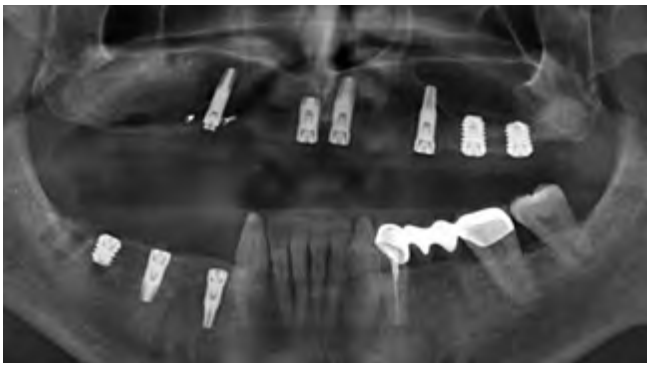
10 I Placement of the lateral wall of the maxillary sinus to display the correct location of the perforations for osteosynthesis screws.



11 and 12 I Securing the lateral wall of the maxillary sinus with osteosynthesis screws.



13 I Subsequently, the whole site is covered with membranes of PRGF-Endoret fraction 2.



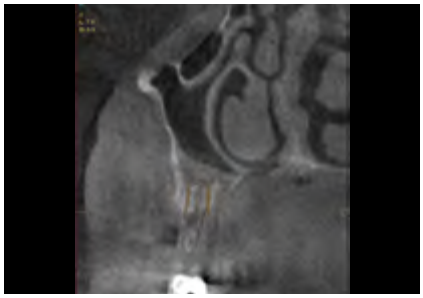
14 I Immediate postsurgical panoramic radiograph. The first quadrant shows the osteosynthesis screws associated with the sandwich technique and the lateral sinus lift.

the primary bone and the lateral wall of the sinus were filled with more particulate bone. Finally, a PRGF membrane prepared from fraction 1 was positioned to cover the graft (lateral wall of the sinus and particulate bone) and the lateral window before flap closure (schematic representation Figs. 9 to 13). Figure 14 shows the panoramic radiograph taken immediately after surgery.

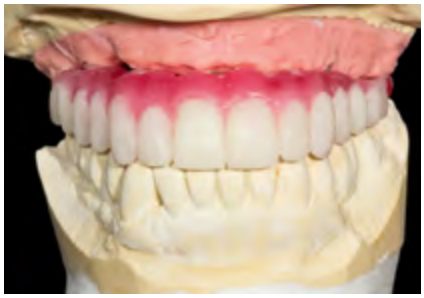
Results

In the initial CBCT, the residual ridge width at the horizontal atrophy location was 2.5 mm. Six months later, a second surgery was performed to insert dental implants. A new CBCT showed that the sandwich technique had achieved a gain in the width of the regenerated area of 5.3 mm, enough to insert an implant at this location. The implant inserted in the horizontal regenerated bone was 5 mm in diameter and 7.5 mm in length (Fig. 15).

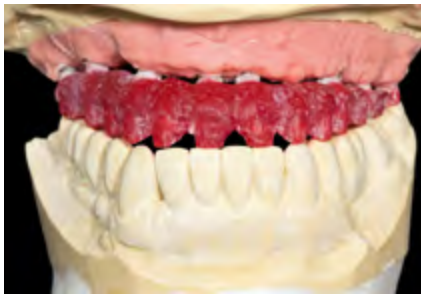
Six months after implant placement, a hybrid prosthesis was inserted, fabricated with a metallic structure and cemented ceramic crowns (IPS e.max; Ivoclar Vivadent, Schaan, Liechtenstein) (Figs. 16 to 28).



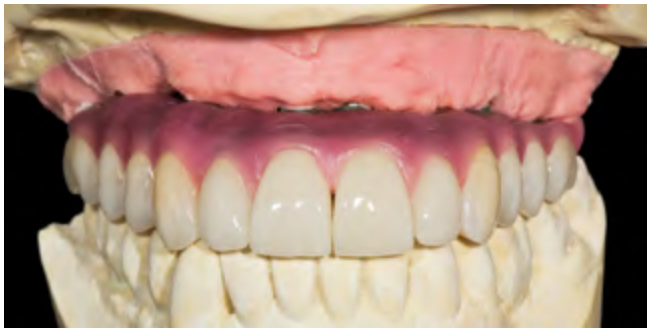
15 I Six months after the first surgery, a second surgery was performed to plan the implantation and assess the augmented bone quantity.

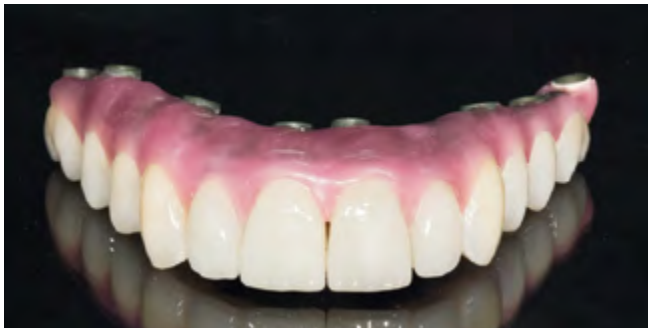


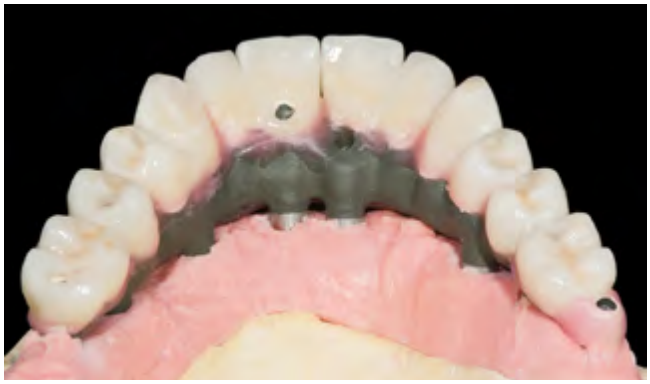
16 I Diagnostic wax-up of the upper prosthesis.

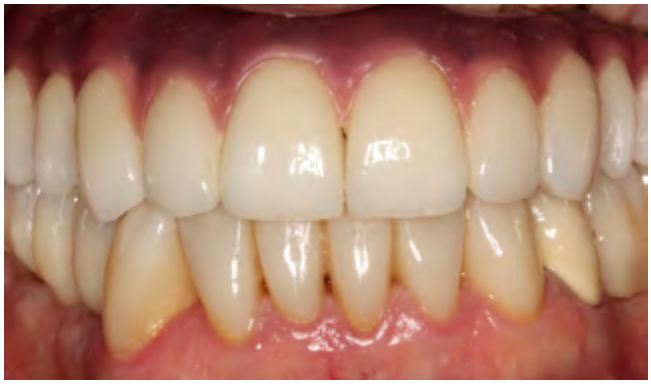


17 I Modelling of the superstructure with castable material.

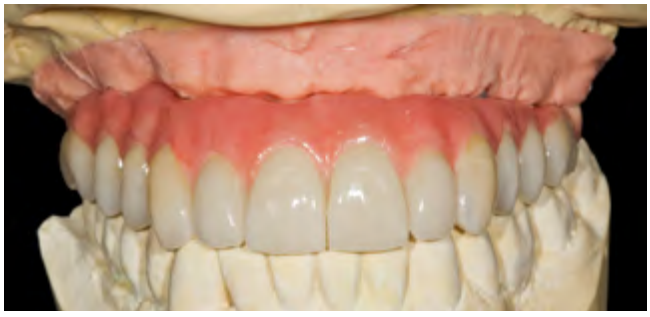


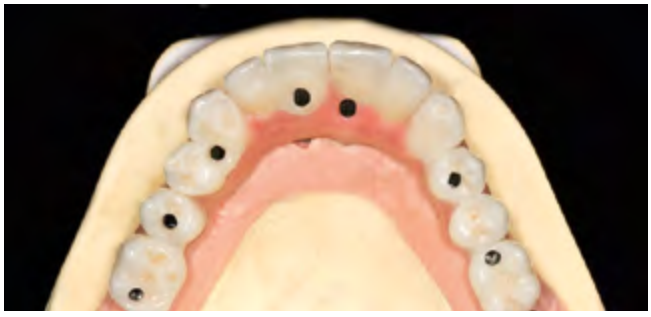






18 to 21 I The metallic superstructure, ceramic crowns and gingiva wax-up.

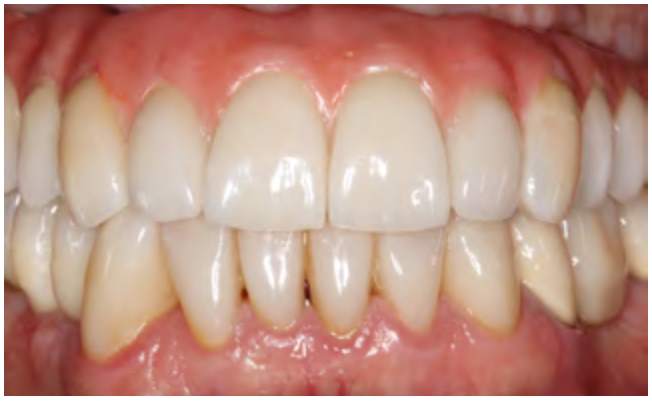


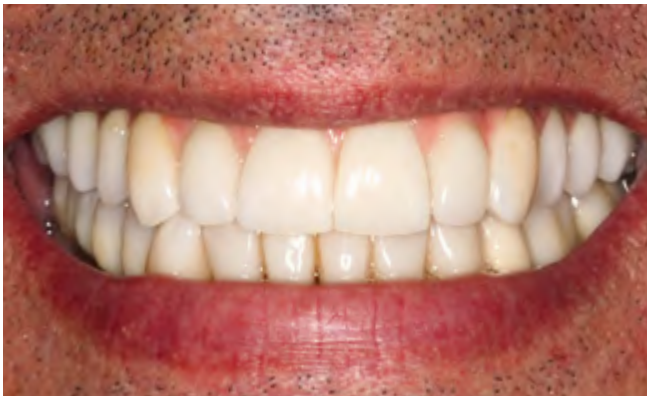


22 and 23 I The definitive prosthesis with the pink ceramic gingiva.

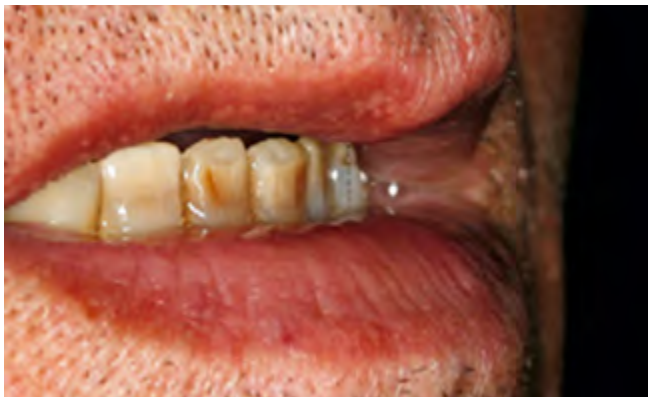
Discussion

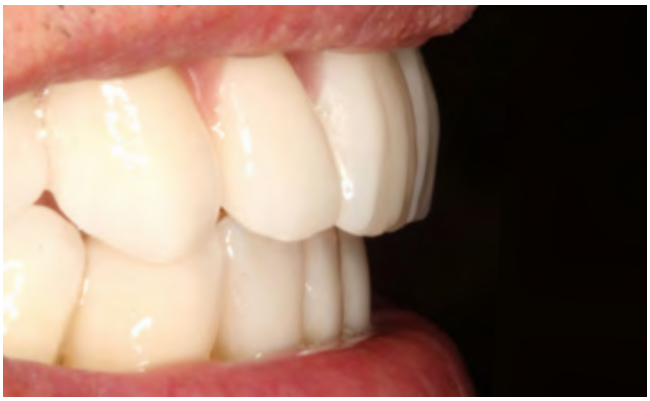
The use of an autologous bone block for the horizontal regeneration of bone atrophy is well documented [1–4]. The use of the lateral sinus wall, as described in this report, is in agreement with the Khoury technique, where thin bone plates are used as reconstruction boundaries. The principal advantage of the lateral wall of the sinus in comparison with other donor sites is decreased morbidity. The harvesting of autologous bone blocks causes inflammation, swelling and pain at the donor site, and in some cases paraesthesia or dysaesthesia



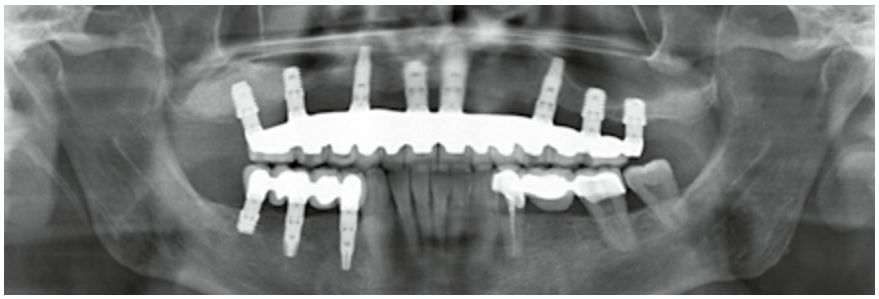


24 and 25 I Intraoral view and the patient's smile with the definitive prosthesis.





26 and 27 I Before and after the treatment.



28 I Panoramic radiograph five years after the treatment.

of the mandibular nerves [14]. The frequency and severity of these complications would vary according to the donor site (lower in the symphysis than in the mandibular ramus) and the surgical technique (piezoelectric surgery vs. rotary instruments). Compared to piezoelectric surgery, rotary burs may lead to higher surgical complications [10, 11]. In this report, the osteotomy at the lateral wall of the maxillary sinus was performed by piezoelectric surgery. The use of the lateral wall of the sinus (obtained during the same intervention in patients who need a sinus lift) reduces patient morbidity. Another advantage of the sandwich technique is the thinness of the graft (the lateral wall of the sinus), which may facilitate revascularization and contribute to maintaining the augmented volume with less bone resorption than with autologous bone blocks.

Conclusion

The utilization of the lateral wall of the maxillary sinus with particulate bone constitutes an effective tool for the horizontal reconstruction of alveolar bone.

The references are available at www.teamwork-media.de/literatur

Contact address

Dr Eduardo Anitua
Eduardo Anitua Foundation
C/ Jose Maria Cagigal 19
01007 Vitoria-Gasteiz
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Expert opinions on 3D bone augmentation

3D or not to be in oral surgery

After decades of dental implantology and millions of treated patients, the proportion of so-called straight forward cases is decreasing in many countries, while complex situations are becoming more frequent. Three-dimensional bone regeneration is one of the keys to solving even the most challenging indications satisfactorily. EDI journal's project manager My To has asked three internationally renowned experts for their personal perspective on this extensive topic.

Statement by Dr Isabella Rocchietta

Dr Isabella Rocchietta

Dr Isabella Rocchietta, EAO board member and research associate at the UCL Eastman Dental Institute (London, UK) warns that sophisticated tools in bone regeneration can by no means replace profound biological knowledge and precise knowledge of the defect anatomy.

When you regenerate, you fundamentally need to know the biological principles that allow or inhibit tissue healing. This knowledge is then used in the specific situation to assess the anatomy of the defect found. It is only after this step that one can even think about which possibly different methods are suitable for reconstruction.

The choice of the appropriate method in a given case is always centered on certain main pillars: first, the available evidence base. Apart from absolute novelties that, by definition, do not yet have scientific evidence, there are useful data for all methods that enable the practitioner to make a meaningful decision. The second important factor is the personal training of the operator. If you have a specific training and perhaps even practical routine with an operation method, you will in many cases be better off with it than with an alternative that may seem superior from the data sheet.

Personally, I do work a lot with the new generation PTFE membranes because I like the easy manner to remove them once the bone reconstitution is completed, and unlike the earlier membrane types, they can also be reasonably monitored in the case of exposure. However, it is certain that in the case of large reconstructions, covering 5 or more tooth positions, a custom-made titanium mesh becomes highly beneficial. Its ability to accurately model the desired curvature of the future bone over larger volumes or distances is of course difficult to beat.

It remains important, however, that its technical performance does not mislead you into underestimating the demanding handling of a titanium mesh - we are talking here about a demanding area of bone augmentation where there are no easy cases.

Statement by Dr Markus Tröltzsch

Dr Markus Tröltzsch, oral and maxillofacial surgeon, Head of the Department for Maxillofacial Surgery in Ansbach Hospital and in private office, and research specialist on bone augmentation, says that non-specialists can also perform augmentations if they have basic surgical knowledge, the right tools and utilize a proper case selection.

Any general practitioner who wants to work his way up to bone augmentation will logically not start with complex situations. A sensible approach

might be to treat a smaller defect with particulate material and a membrane – perhaps rather with a resorbable collagen membrane due to its easier handling in case of complications. When more experienced and save in techniques such as soft tissue management, the colleague could use titanium mesh to approach small gaps, while continuing to apply the basic rules learned from minor defects, such as proper preconditioning of the bone and tension free suturing.

We have published data on this specific issue and you can generally say that for minor defects, a classic GBR approach will do. But when it comes to larger reconstructions, about 3 mm or more, you need a solid element and, here, the autologous bone block is always the gold standard for me. Or better, it would be the gold standard – I say this because the morbidity due to the donor site can be a real problem for patient acceptance. That's why the custom-made 3D titanium scaffold is also a nice instrument in these challenging situations. Preconditioning the bone provides autogenous material that is then mixed with a nonresorbable material to fill the mesh volume – this elegantly avoids the resorption problem of autologous bone blocks.

Somewhat more tricky facets when working with such meshes can be the exact fit of the customized scaffold once it is completely filled, or the correct positioning of the necessary fixing screws. However, with a little practice, this can be easily mastered, more important is actually a good final soft tissue management. Later, when removing the scaffold, it is absolutely necessary to use a large access in order to be able to work properly. The scaffold itself can usually be removed easily, however the bone layer directly underneath can have a suboptimal structure. This can be prevented during case planning, for example by slightly over-contouring the augmentation. Mesh dehiscence can cause a serious bone deficit so here the management an planning are crucial.

Dr Markus Tröltzsch

Statement by Professor Bilal Al-Nawas

Professor Bilal Al-Nawas, head of the Department of Oral, Maxillofacial and Plastic Surgery at the Gutenberg University in Mainz (Germany) and associate professor at the University of Seoul (South Korea), takes the view that every method has its own significant complication rate and that therefore no golden rule exists.

Looking at the scientific data on bone augmentation, the complication rates of different approaches all lie between 10 and 20 per cent in the reviews and then they are also very surgeon-dependent. This means that every surgeon has his own method with which he is successful and he cannot simply switch to another one now. That is one point – but if you look at the biology of the methods, they all have actually turned more and more to the shell technique with any particulate materials, so we are looking for this space creation. This means that you have to be able to manage soft tissue, plastic wound coverage, no matter which method you use, and you have to know biology: what can a material achieve after all? In clinical reality, we find that you can be successful with a PTFE membrane with titanium reinforcement, or with printed titanium grids, that's partly also case-dependent and operator-dependent.

And then, of course, the techniques have their special indications, where we would say: if it becomes very complex and three-dimensional, then you will rather go for a 3D custom-made titanium scaffold, because this would be very difficult to realize with a GBR. If it is a smaller defect, maybe you will still take a titanium-reinforced PTFE membrane, and if it is a three-wall defect, it actually remains a classic GBR.

Another highly interesting aspect of the titanium scaffolds is, of course, their integration into surgical planning. As is well known, we work with a prosthetics-driven approach there and at the same time the available bone is factored in in the best possible way. Thanks to the digitized production of the 3D scaffold, bone augmentation can now be directly incorporated into the planning phase as a connecting element between prosthetics and surgery - this saves operation time and increases the predictability of the procedure.

Professor
Bilal Al-Nawas

A panel of experts on sinus floor augmentation

„Sinus floor augmentation – is there any news?“

Such was the title of a highly interesting session at the last international Osteology Congress in Barcelona. Under moderator Dr Alberto Sicilia, four proven experts of this speciality shared their knowledge with the participants.

Experts of sinus floor augmentation (from left): Professor Luca Cordaro, Dr Pascal Valentini, and Professor Tiziano Testori. Missing on the photo: Professor Franck Renouard.

Professor Franck Renouard (France) was the first lecturer and made the case for short implants. Scientific data suggest today that they are not significantly less reliable than normal length implants – but they have of course the potential to make the sinus floor augmentation redundant as long as a minimum of 6 to 7 mm of bone height is still available. According to Prof. Renouard, a short implant instead of a long one with sinus surgery is also by far preferred by patients. The only potentially increased risk mentioned by this expert was that short implants might be more difficult to save in case of a future peri-implantitis. If less than 6 mm bone is available, *Professor Renouard* however still recommended a sinus floor elevation instead of extra short implants – simply because scientific evidence for those is clearly to weak at the moment.

Professor Luca Cordaro (Italy) then talked specifically about the lateral window technique. He stated that, in spite of the very good scientific evidence and notwithstanding the practical familiarity of many surgeons with it, also this approach is not to be used as a standard procedure. There are situations where a lateral window surgery is clearly indicated but there are numerous cases as well which requires for example additional horizontal or vertical augmentation – this should also influence the choice of the floor augmentation method. *Professor Cordaro* also called for a very careful selection of the exact material type when using bone graft substitutes.

Third speaker was *Professor Tiziano Testori* (Italy) who gave specific insights in the challenges and advantages of the trans-crestal technique and claimed that all situations in the posterior maxilla are evaluated individually. He promoted a decision tree that in every patient case first clarifies whether fixed teeth are achievable without a sinus elevation – be it through the use of short implants, trans-sinus implants or other alternatives. Where none of these options are feasible and a sinus lift is unavoidable, *Professor Testori* recommended the trans-crestal floor augmentation with a minimal flap, especially in partially edentulous cases. Only in case of complications with the trans-crestal approach, he advised actually to use the lateral window technique as a kind of last option. Following *Professor Testori*, minimizing the surgical intervention has always the patient's preference and therefore must the first goal of the treatment plan – which is also often subsequently confirmed by the measurable clinical success.

The meeting was rounded off by the presentation of *Dr Pascal Valentini* (France), a very well-known specialist for complication management in sinus floor techniques. He strongly suggested not to underestimate the severity of these interventions and therefore advocated that oral surgeons should more often collaborate with other medical professions. The preferential partner of *Dr Valentini* in such cases are the ENT specialists who can be a precious support already for patient selection and preparation, and of course also when it comes to necessary modifications of the anatomy or when pathologies need to be treated. And, last but not least, the ENT colleague can be a great help if complications have to be treated. For *Dr Valentini*, the best chances of success in sinus floor procedure are with a cautious approach from the surgeon, combined with his openness to use the potential synergies with experts from other specialties.

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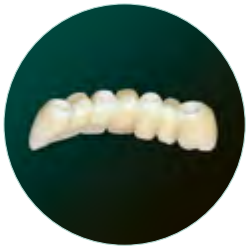
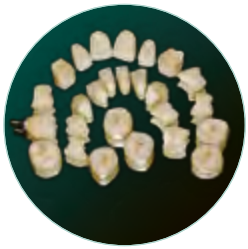


Prosthetic Frameworks



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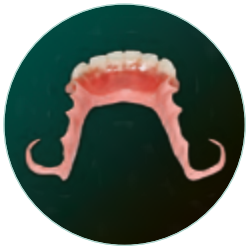

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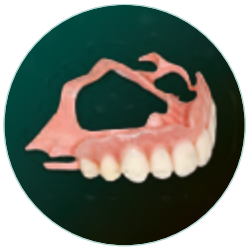
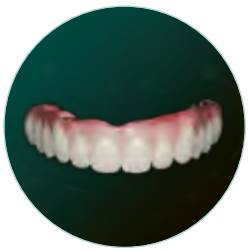
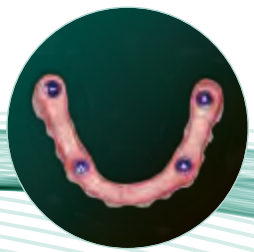




Fixed Prostheses



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Nobel Biocare Global Symposium, Madrid, Spain

A focus on biology and on needs

How to treat patients individually and minimally invasively? How to utilize digital dentistry? How to achieve predictable long-term aesthetic success? These were just some of the questions raised by some 70 international experts at the Nobel Biocare Global Symposium in Madrid in late June 2019. The focus was on the new Nobel Biocare N1 implant, a new drilling protocol and the integration of the digital workflow into clinical practice.

"We follow no one." This was the motto under which Nobel Biocare presented more innovations to the around 1,200 participants from 60 countries in Madrid, shortly after the IDS in Cologne. After about 18 months of clinical pilots, the veil on N1 has now been officially lifted in Spain. *Hans Geiselhöringer* (President Nobel Biocare Systems), *Henrik Petersson* (Vice President Product Management Implant Systems), and *Professor Stefan Holst* (Vice President Global Research, Products and Marketing) provided a glimpse of Nobel Biocare N1, a conical implant system with a trioval anatomical shape designed to prevent rotation. In conjunction with the new Xeal and TiUltra surfaces, integration into the soft tissue (Xeal) and bone (TiUltra) is designed to progress rapidly. The idea behind the development of the new implant system is to bring together biological processes, patient wishes and user/practitioner requirements. From planning to prosthetics, Nobel Biocare N1 is designed to optimize workflows and improve patient comfort. Renowned pilot users have attested to good primary stability and easy handling of the implants in their daily practice.

Less is more – from speed skills to "speed kills"

Following this realization, Nobel Biocare presented a new drilling protocol that uses a maximum of two drills (OsseoDirect/OsseoShaper) to prepare the implant bed slowly, gently and thus regeneratively – "direct – shape – place". A special feature of

Photos: Natascha Brand

Must cones necessarily be round? Professor Stefan Holst (left) and Henrik Petersson explained the idea behind Nobel Biocare N1: "We have put 60 years of implant experience into the development of N1, and we have examined the biological facts and the users' needs in great detail."

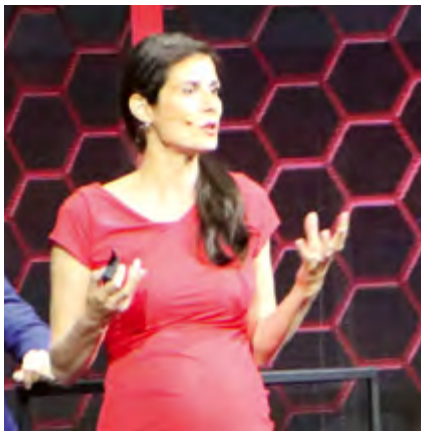
Aesthetic concepts are subject to cultural differences and are implemented individually, as was demonstrated by this panel. Left to right: Host Professor David Dunn, Dr Bernard Touati, Dr Iñaki Gamborena, Dr Michael Gahlert, Nasser Shademan and Professor Markus Blatz.

the OsseoShaper is its cutting pattern that ensures that soft bone is compacted while dense bone is cut. The bone chips obtained and retained with the OsseoShaper using the low-speed method are valuable for bone regeneration and promote the rapid formation of new bone, as *Professor Jill Helms* (USA), confirmed on the basis of her histological research. For patients, this means less vibration and less unpleasant noise during implantation. "This means that more high-anxiety patients will now opt for implant treatment", as *Dr Annette Felderhoff-Fischer* (Munich) pointed out.

DTX Studio: The digital ecosystem

Diagnostic procedures in everyday clinical practice often still consist of a sequence of analogue steps. "3D diagnostics is still the exception", said *Dr Pascal Kunz*, Vice President for Digital Solutions at Nobel Biocare. "The integration of hardware and software is the success factor of DTX Studio, an open concept." *Dr France Lambert* (Belgium) confirmed this in her plea for the advancement of digital dentistry: "The central element is the software. This is where all the data converge. For example, the new tool for patient monitoring has been very helpful." *Dr Peter Wöhrle* (USA) also emphasized the importance of retrieving all data in a well-structured manner. Where different software programs were previously needed, DTX display everything on-screen at a glance.

NB



Dr France Lambert represents a new generation of women in dentistry: "Digital dentistry opens the door to patient-oriented, minimally invasive treatment."

Hans Geiselhöringer: "We want to improve everyday tasks in the practice and laboratory."

A hands-on workshop led by Dr Paul Weigl where participants can try their hands at inserting Nobel Biocare N1 implants with the new drilling protocol.

Sharing their first experiences with Nobel Biocare N1 and OsseoShaper and elaborating on developments and research findings: Henrik Petersson, Dr Peter Wöhrle, Dr John Brunski, Dipl-Ing Holger Zippich, Dr Oded Bahad, PD Dr Paul Weigl, Dr Annette Felderhoff-Fischer, Professor Jill Helms and Professor Stefan Holst (left to right).

Photo: ofezzo – stock.adobe.com

International Implant Symposium 2019 at the University of Corsica, Corte, France

Island of beauty and excellence

This year already for the twelfth time, the International Implant Symposium organized by the University of Corsica took place on 31 May 31 and 1 June in Corte. Under the scientific directorship of Professor Franck Renouard and the title "Two days with the masters", the 150 participants were offered high-quality content by four real world-class speakers.

Dr Homa Zadeh, EDI Journal Project Manager My To, and Professor Joseph Kan (from left) met at the International Implant Symposium in Corte.

Soft tissue specialist *Dr Homa Zadeh*, an Associate Professor at the USC School of Dentistry (Los Angeles, USA) and a Diplomate of the American Board of Periodontology, started with his lecture on „Periodontal and peri-implant regeneration: opportunities and challenges". He stated that today actually the most important skills of a clinician are probably not the technical ones but the ability to make the right decisions in a given situation. Among the various techniques available for periodontal plastic surgery, *Dr Zadeh* reported very good results especially with the Vestibular Incision Subperiosteal Tunnel Access (VISTA) which seems to offer a better root coverage than a traditional flap, while causing less patient morbidity. He recalled that many dentists probably give up compromised natural teeth too early. According to scientific data he cited, around 80 per cent of teeth with a poor prognosis and 30 per cent of those considered as hopeless are still in place 15 years later. According to *Dr Zadeh*, it therefore makes sense to consider very carefully in the patient's interest whether an extraction with subsequent implantation is always the best solution.

Dr Joseph Kan, Professor at the Department for Restorative Dentistry of the Loma Linda University School of Dentistry (USA), spoke about „Tissue management for anterior Implant aesthetics: The ortho-perio-restorative connection". The experienced practitioner said that a more than serious case planning, which of course means a restorative-driven planning, is an absolute basic condition for successful clinical work. As biology is always the limiting factor in clinical reality, *Dr Kan* proposed a critical case selection that takes into account several aspects: for example, that regeneration measures directly adjacent to periodontally compromised teeth are always delicate, that vertical bone augmentation is less predictable than other steps, and that in papilla aesthetics only the thickness of the gingiva can be reliably improved.

Professor Irena Sailer, Head of the Division of Fixed Prosthodontics and Biomaterials at the University of Geneva, came third in this program of high standing. Her lecture on „Characteristics of implant prosthetic materials" looked at the topic from a patient-oriented and cost-conscious perspective. She continues to regard metal-ceramic implant reconstructions as a relatively safe way to achieve a very good aesthetic result – provided that the rather high costs are acceptable and frequent chipping through occlusal contact can be considered avoidable in the specific patient case. She emphasized that the general trend is clearly towards titanium bases that can be manufactured in various ways and used in many different indications. In addition to the favourable compromise between aesthetics and mechanical stability offered by the hybrid versions of titanium bases, they also fit well into a largely digitized workflow. Professor Sailer nevertheless urged the clinicians to proceed meticulously with case planning.

Dr Mauro Merli, Professor of periodontology, closed the circle with his lecture on „New trends in bone reconstruction and soft tissue management". As the basis for long-term success in guided bone regeneration, *Dr. Merli* presented the four most important biologic principles, also known as the PASS concept: primary wound closure for an untroubled healing process, angiogenesis for a sufficient blood supply, space creation for the future new bone, and stability of the operating area. Other core aspects discussed by *Dr Merli* included the choice of the suitable membrane and bone graft material. He said that nevertheless enough keratinized attached mucosa, as well as the patient's will and ability to maintain healthy oral conditions contribute at least as much to treatment succes as the chosen material.

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Dentsply Sirona at the EAO 2019

Making the difference with evolution, innovation and convenience: Dentsply Sirona invites all participants of the EAO 2019 in Lisbon to join its popular Inspiration Talks on Thursday, 26 September from 5 to 7 pm in Room 6 of the Centro de Congresso de Lisboa.

High quality implant dentistry is like the art and science of building a bridge. You start with a foundation based on science, followed by detailed planning and precise surgical skills, completed by a unique, aesthetic, restorative design. Together with solutions based on continuous evolution, digital innovation and convenience, the final result makes a difference for each and every patient. And just like the bridge, implant dentistry helps overcome obstacles and create opportunities—to enjoy life again today and tomorrow. *Dr Lyndon Cooper* from the USA, *Dr Malene Hallund* from Denmark and *Dr Martin Wanendeya* from the United Kingdom will be the speakers of this inspiring symposium.

More information
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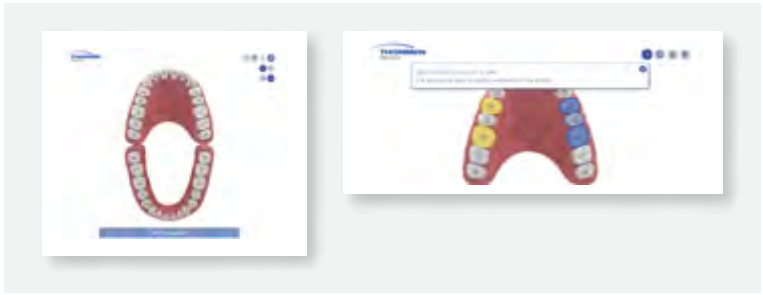

Dentsply Sirona World 2019

A unique experience for dental professionals

Dentsply Sirona World returns to Las Vegas, Nevada for one of the industry's ultimate dental meetings. The annual event will take place from 3 to 5 October 2019 at the Mandalay Bay Resort and Casino. The three-day educational event features nearly 100 of the best and brightest speakers in dentistry presenting in hands-on sessions, classes and workshops across twelve unique tracks.

Dentsply Sirona World 2019 at the Mandalay Bay Resort and Casino in Las Vegas will be a celebration of dentistry.

Dentsply Sirona World 2019 in Las Vegas will bring together thousands of professionals from nearly every area of dentistry for three days of learning, motivation and fun. Participants have described it as the "can't miss event" of the year. "Dentsply Sirona World stands out. The variety of topics is unique and there is hardly any area in the world of dentistry that we don't address in depth," said *Eric Bruno*, Senior Vice President North America RCO at Dentsply Sirona.

Cutting-edge courses tailored to individual needs

Dentsply Sirona's comprehensive training programs reach more than 431,000 dentists worldwide annually through approximately 12,000 courses. Using that vast experience to plan the educational programme at Dentsply Sirona World 2019, general practitioners, specialists, lab technicians, hygienists and assistance teams will all benefit. Nearly one hundred speakers representing the top-tier of dentistry will share their expertise.

There are 12 tracks with introductory to expert level courses available to participants ranging from specialties such as implantology, to laboratory courses, to the all-important hygiene topics. For example, the 34th anniversary of Cerec will be celebrated with a dedicated Cerec track, where attendees will find out all the latest information regarding the Cerec solution spectrum. Follow one specific track or mix-and-match to make Dentsply Sirona World a completely personal and customizable educational experience. The hosts aim to also inspire participants and help dental professionals to achieve their dreams with tracks focused on office design and business & practice management.

The latest innovations in dentistry

Attendees have the chance to learn about and get hands-on experience with Dentsply Sirona's recent innovations, such as the new intraoral scanner Primescan, which represents a significant step forward in digital impression-taking. Guests will have the opportunity to ask questions directly to employees and early adopters about these and other new developments.

Plenty of surprises in store for guests

Dentsply Sirona World isn't known as the Ultimate Dental Meeting solely for its learning opportunities. The last time the event was held in Las Vegas, runners donned their favorite intergalactic gear for an alien-themed, untimed three-mile morning run down the Vegas Strip to promote health and wellness. This year's agenda includes a 5K Treasure Trot Fun Run and yoga as health and wellness opportunities on the Friday and Saturday mornings.

Returning attendees of Dentsply Sirona World know to expect some big surprises for entertainment helping to make Dentsply Sirona World 2019 an unforgettable event. According to *Ingo Zimmer*, Vice President of Marketing US CCO at Dentsply Sirona, "participants can look forward to an outstanding entertainment programme, which I would like to keep mostly under wraps for the moment although I will share that world famous comedian *Jerry Seinfeld* will be performing. I think I can safely say that our program will meet, if not exceed, expectations!"

More information and registration
www.dentsplysironaworld.com

Find the best

Bego Implant Systems is proud to announce the initiation of its Third Clinical Case Award. The competition is aimed at all Bego Implant Systems' users and will reward the best clinical cases involving Bego Implant Systems products.

The Bego Clinical Case Award recognizes implantology cases treated using Bego Implant Systems products. The cases will ideally be in the fields of implant surgery, computer-assisted surgery, soft tissue regeneration, prosthetic rehabilitation or a combination of these.

The competition is open to dentists and dentistry students from all over the world. Each participant may submit more than one patient case for assessment by an independent panel of specialist judges.

The best cases will be awarded with premium prizes, for example an invitation to the Fifth Bego Implant Systems Global Conference on the "Art of Implantology" in Amsterdam, the Netherlands, in 2020 (including flights, accommodation and all fees), an iPad Pro* 256 GB Wi-Fi, a Bose* SoundTouch 30 Series III Wireless Music System, and other attractive prizes.

Seize the opportunity and win one of the premium prizes at the Bego Clinical Case Award.

The competition closes 31 December 2019. For more information, visit the Bego website.

* This is a commercial name/registered trademark of a company not forming part of the Bego Group.

More information
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The first-class event dedicated to innovation

After the success of the first edition, it is with great pleasure that Mectron is announcing the Spring Meeting 2020 which will take place in Venice, Italy, on Friday 8 and Saturday 9 May 2020 in the spectacular venue of Isola San Servolo, in the lovely Venetian setting.

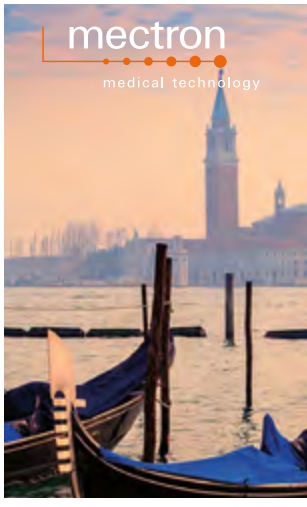
The scientific programme is focused on the new Rex PiezoImplant, an innovative wedge-shaped implant specifically developed to simplify the surgical treatment of narrow ridges.

The second important topic involves a new piezoelectric surgical protocol dedicated to third-molar extraction procedure, in order to make such an advanced technique safer and faster in the daily clinical practice.

For the first time, the Mectron Spring Meeting will offer a parallel Dental Hygiene programme highlighting ultrasounds and air-polishing benefits in daily prophylaxis practice. A joined session of dentists and dental hygienists will focus on surgical and non-surgical periimplantitis management.

Hands-on sessions will help every participant to acquire an improved understanding of the new techniques thanks to the various exercises the participants are going to perform on bone models. Prestigious international and national speakers will illustrate their own techniques through detailed protocols and a vast assortment of clinical cases, the result of extensive experience and continuous scientific research.

More information and registration
www.mectron.com/spring-meeting



Camlog Digital Dentistry Training Week in Freiburg, Germany

Fast, comprehensive, and value for money

The Camlog Digital Dentistry Week is a five-day course that teaches the complete digital workflow in the dental practice with theoretical and practical modules for every workflow step. The course is intended for dentists who want to learn what it means to implement a digital workflow in their practice. Participants will get a detailed overview on all of the components of the workflow and will be able to implement each step by themselves in combination with practical exercises.

After completing this course, participants will have a profound knowledge of all digital workflow steps in the dental practice and will be able to:

- decide which digital steps could be implemented in their daily workflow;
- rate an implant system based on its digital compatibility;
- choose a suitable soft- and hardware;
- get in touch with experts in every field.

Module 1: Diagnostic
Start with a radiation protection unit followed by fundamental information about the DVT technology. Learn to interpret DVT/CBCT images and understand the principles of three-dimensional representation. Recognize anatomical variations and pathologic conditions. Get to know the CBCT key metrics in dental implantology and understand effective patient doses to minimize exposure.

Module 2: Intraoral scan, data matching
Use an intraoral scanner on training models and learn how to match the STL surface data with the DICOM data from the CBCT scan. Several models and cases are available for a detailed training session. Create printed models with a model builder software and get to know the different types of implant analogs.

Module 3: Restoration design, guide design
Receive a basic 3Shape Implant Studio course and start to use the latest software version to design implant bone restorations. There will be numerous cases waiting on your training computer to be completed. Learn how to use the aligned data with digital backward planning for a correct surgical guide design. The prosthetic restoration determines the final implant position.

Module 4: Guided Surgery
Learn the advantages of guided surgery and get your first experience when using a guide template to place several training implants in a model. Get to know the different guide designs with the advantages and disadvantages for specific treatments. Be there when experts show their handling of the template during a live guided surgery.

The speakers
Dr Dennis Rottke
Executive Director Digitales Diagnostikzentrum GmbH, Freiburg, Germany
Dr Tabea Flügge
Senior oral surgeon in the Department of Oral and Maxillofacial Surgery at the University Medical Center in Freiburg, Germany
DT Marcus Marcussen
3Shape Academy Trainer, Copenhagen, Denmark
Dr Florian Kernen
Board Certified Prosthodontist at the Department of Oral and Maxillofacial Surgery at the University Medical Center in Freiburg, Germany

Date
16 to 20 November 2019

More information and registration
www.camlog.com

Interview with Charlotte Stilwell, President-elect of the ITI

The ITI as a vanguard

With Charlotte Stilwell, the ITI has decided for the first time in its history to have a female president at its helm in the future. The association is thus demonstrating that, four decades after its foundation, it wants to continue to play an exemplary and pioneering role in implant dentistry. Project Manager My To from the EDI journal talked with the very experienced prosthodontist from London, UK, where she has her own specialist referral practice. Charlotte Stilwell attaches great importance to a patient-centered approach in her clinical work and teaching.

The ITI becomes the first major global organization in implant dentistry to have a female president. What does this mean to the field?

The ITI obviously demonstrates its open-mindedness and sends a very positive signal. Hopefully, this will serve as an important example: the rapidly growing number of women dentists can and must be adequately represented in our discipline.

For many years, you have been strongly involved in teaching within the ITI but you do not come from the classical university environment.

Indeed I have a predominantly practice-based background in general dentistry and as a specialist prosthodontist. It is often a favourable combination of practical experience and scientific knowledge that brings the most significant progress. And it shows that the organization is dynamic and agile not only in terms of gender equality.

How do you see ITI's future – can we expect even more progress than already seen?

Today, we have an unparalled worldwide presence in implant dentistry with over 18,000 members. This represents an enormous wealth of knowledge and a phenomenal network of expertise. It is our responsibility to make this available to whoever needs it globally. By the way, the 2020 ITI Symposium will take place for the first time in Asia, with probably over 6,000 participants.

In which direction would you like to develop the ITI personally?

Our current president, *Dr Stephen Chen*, and his predecessors have continuously evolved the ITI. With the ITI Curriculum program we are completing the educational circle and bringing a consistently high standard to educational offerings for all players; general practitioners, specialists, hygienists and dental technicians. Implant dentistry is a team discipline, and we will make sure that all involved in the workflow are duly represented in the ITI organization.

Besides strengthening the team aspect of implantology, which other aspects will you focus on?

I see a need for driving access to patient-centered best-practice implant therapy and universal routine implant care. With 25 million implant placed annually, it is crucial that all dental professionals feel comfortable around implants regardless of whether they actively provide implants or not.

Thank you very much for your time and the insightful interview.

MT

The first female president in the ITI's almost 40-year history: Charlotte Stilwell.

At the 2019 Annual General Meeting, the ITI General Assembly voted for its new President-elect.

Interview with Walter Esinger, Executive Managing Director Bego Implant Systems, Bremen, Germany

Well prepared for the future

Bego Implant Systems is a globally operating medium-sized company with an outstanding reputation within the dental industry. Equipment and materials "Made by Bego", the proven Bego system und Bego know-how are synonymous with top-quality products which combine safety and reliability. But even successful companies must prepare for the rapid changes in the industry and embrace the future. The editorial team of EDI Journal talked to Walter Esinger, Executive Managing Director of Bego Implant Systems, about the company's perspectives.

Walter Esinger, Executive Managing Director of Bego Implant Systems

The concentration in the dental industry through takeovers and mergers continues. Bego Implant Systems is one of the few remaining independent medium-sized German companies in the industry. Will this remain so?

As you know, we dealt very intensively with the topic of an "strategic investor" for Bego Implant Systems last year. Ultimately, we decided to plan our future "independently". In making this decision, we took particular account of our responsibility to our employees and customers.

Which company philosophy is at the basis of your market strategies? Is it more important for a well-established company to stay true to its philosophy or must it adapt to changes in the industry?

I think it's wrong and dangerous to ignore market changes. By this, I also mean global market changes that have arisen as a result of various political developments and that place great demands on us today and will do so in the future. Another very important point I would like to mention is the development of the dental market from small practices to dental care centers, hospital chains, and dental service organizations. Today, many of our customers are no longer the sole decision-makers but are organized in professional buying centres. Sales talks, as we have successfully conducted them until now are increasingly becoming a thing of the past. We are therefore challenged to merge our company philosophy of "affordable and high-quality dental implant solutions made in Germany" with the requirements of dynamically changing markets. But I am firmly convinced that we will continue to succeed in this regard in the future.

The markets of the future are primarily in Asia and South America. Is your company positioned to take this development into account? What are your top-selling markets?

We have been very well positioned in Asia for over ten years now. With our long-standing sales partner in China, we have joined the group of market leaders and have been ranked among the top 5 suppliers there for years. With a market share of over 30 per cent in the value segment, we are even the market leader here. In addition to Taiwan, we are also successful in Thailand, Indonesia and other smaller markets.

We have great respect for entering the Japanese market and have taken this country off our hit list for the time being. After starting in South Korea, we quickly realized that we would not be able to assert ourselves against a big competition there. We are still observing developments in South America. No decision has yet been made on market entry. In South America, we see great challenges in the current price positioning of dental implants, because pricing there is currently incompatible with our value approach.

Are there any efforts concerning the forthcoming MDR to join forces with other German medium-sized companies or does the MDR even protect the German market against imports from non-European manufacturers?

A core element of MDR compliance is the company's documented quality management system. In fulfilling MDR compliance, cooperation with other medium-sized companies does not lead us any further. Which means that we are forced to solve the challenges with our own staff and with external cooperation partners and consultants by May 2020.

I cannot assess conclusively to what extent MDR protects the German market from import activities.

What worries us all is the hesitant process of accrediting the more than 50 active Notified Bodies. Less than 30 have submitted the accreditation documents and only four have received accreditation to date. The future might become dramatic for manufacturers whose Notified Body will not receive MDR accreditation until May 2020. Indeed, products may still to be sold without technical modifications until 2024, but it nevertheless dampens the innovative strength, which is essentially borne by small and medium-sized enterprises. I don't even want to talk about the necessity and the challenge of trying to find another certified Notified Body. Fortunately, we cooperate with a Notified Body, which will most likely receive accreditation very soon.

The buzzword "digital workflow" is a must today, too. Can you briefly explain in what way Bego Implant Systems is at the forefront here?

We started marketing this topic at IDS 2017. We can already support the digital workflow with many outstanding isolated applications, such as pre-surgical planning, 3D template production and individual (CAD/CAM) prosthetics in cooperation with Bego Medical and our laboratory network.

In order to better serve the increasing market requirements, we are in the process of translating the solutions into a coherent process. Of course, we are also dependent on cooperation partners such as manufacturers of intraoral scanners and internally on Bego Medical. With a degree of fulfillment of over 90 %, we are very well positioned and can already offer our customers a very good overall package.

Thank you very much for the informative insights, Mr Esinger.

MT/IL

BioHorizons Camlog invites to Lisbon

From 26 to 28 September 2019, BioHorizons Camlog will take part in the European Association for Osseointegration Congress EAO in Lisbon, Portugal, where the company will present some special highlights for all participants of the event.

On Thursday, 26 September from 9 to 12.30 am, under the supervision of the EAO Junior Committee, BioHorizons Camlog will provide a hands-on training for young clinicians during the "My first implant" session with the Progressive-Line implant, which was launched at IDS earlier this year.

Later that day, from 5 to 7 pm, attendees of the congress are invited to the BioHorizons Camlog Satellite Symposia (room no. 8), where novel techniques that accelerate clinical developments will be presented. Experts taking the stage include *Dr Tiziano Testori* (Italy), *Dr Fernando Guerra* (Portugal), *Dr Gerhard Iglhaut* (Germany) and Dr Mariano Sanz (Spain) as a moderator. Based on clinical outcomes and scientific evidence, new possibilities within the BioHorizons Camlog solution portfolio ranging from surgical options in compromised sites to novel regenerative matrices will be highlighted. For more information, visit the EAO website here: http://congress.eao.org/en/programme/symposia.

Photo: allard1/stock.adobe.com

BioHorizons Camlog invites everyone to visit its booth C25 and get access cards for the hospitality suite HS5, where a programme of news, networking, and meeting experts awaits them.

More information

www.camlog.com
www.biohorizons.com

Interview with Dr Tae Kwan Eom, CEO of Osstem Implant

"We need to try harder"

In 2018, Osstem Implant secured 7.5 per cent of global market share and the global Top 5 position. In the Asia Pacific region, the Korean company even reached the overall pole position. But enough is not enough: Osstem Implant's objecitve is to become the global Number 1 by 2023. Osstem Implant CEO Dr Tae Kwan Eom told the EDI Journal how his company intends to reach this ambitious goal.

From head of R&D to top management: Osstem Implant CEO Dr Tae Kwan Eom

Before you became CEO of Osstem Implant in 2017, you led the company's R&D department for many years. How important is R&D in your company?

R&D is the core DNA of Osstem Implant. *Dr Kyoo Ok Choi,* dentist himself and founder of Osstem Implant, started the company to contribute to the improvement of human health by helping dentists to provide "decent treatment". Accordingly, it has become our mission to provide good products and good clinical knowledge to the dentist. As this mission can be only achieved by R&D, we have been consistently investing 7 per cent of our annual sales on R&D since our foundation.

Medicine has developed with the help of both medical knowledge and medical device. That's why the Nobel prize in Physiology or Medicine has been awarded to many medical engineers as well as doctors. Dreaming to be one of them, our 400 researchers in Osstem implant are deeply devoted to R&D.

What makes Osstem Implant special compared to other major competitors?

Customers choose products based on quality, price, and service. As for dental implants, I think that quality is the most important factor to the customers and I'm quite confident that the quality of our implant is the world's best. Specifically I would like to point out the feature of the body design and surface treatment of our TS implant.

In general, the design of dental implants is divided into straight type and tapered type. Straight type has the advantage of easy depth control and tapered type of good primary stability. And each body type has the disadvantage vice versa. TS Implant is basically tapered but its unique design enables easy depth control as well. As TS Implant has the advantages of each body type, it significantly improves the user convenience, consequently raising the implant success rate.

Another important technology is the surface treatment. Osstem Implant has various surface treatment technologies adaptive to different clinical cases, ranging from SA surface (sand-blasted with alumina and acid-etched surface), the most widely used and clinically proven in the long-term, to NH (nano hydroxy-apatite), coated with 10 nm low crystallized apatite on SA surface, to SOI surface coated with pH-buffering agent. These different surface treatments help clinicians to secure excellent results even in severe cases.

Which specific data prove the quality of your implants and Osstem's excellence?

Osstem Implant sold 2.33 million implants in 2017, and based on the report "Dental Implant Competitor Insight 2018" by Millennium Research Group, this is the largest volume among global market. It's a significant achievement that Osstem Implant has become a global brand which dentists around the world use the most. In 2018, our company also stood at the top of the list with sales of 2.86 million fixtures.

According to "Subjective satisfaction of clinician and short-term clinical evaluation of Osstem TS III SA Implant" by Seoul National University Bundang Hospital, where TS Implants with SA surface were used in various bone conditions, they showed 99.6 per cent of primary success rate. In the same research, healing time before prosthetic loading showed 3 to 4 months on average.

Can you tell us something about your plans for a next generation implant system?

Our mission and goal is to improve success rate of implants even in severe clinical cases. For this, we are continuously innovating in all R&D processes, from materials, design, and manufacturing, to clinical application and prognosis observation. For now,

I can only reveal that we are conducting intensive research on the development of "robust design".

We are also focusing on the digital workflow, obviously a big trend in dentistry. We are approaching this concept not by simply changing "tools" but as a fundamental shifting. Since 2014, we have been concentrating our investments and R&D on this field to set up a "digital dentistry full line up"' including dental equipment, materials, and software.

You have the vision to become global No. 1 in 2023. How do you see your position in Europe in 2023?

To become the global No. 1 in 2023, we need to increase our annual sales up to 25–30 per cent for the next five years. As our current CAGR is about 15–20 per cent, we need to try harder and we are seeing digital dentistry as our next growth power to bridge this gap. Providing digital solutions in all areas ranging from diagnosis to surgery to prosthetics, we'll consolidate our identity as a digital leader.

Although our market position in Europe is still not strong compared to our global position, we are continuously expanding our network and plan to invest more resources in this important market. Especially as we see the high potentials of digital dentistry in Europe, we are convinced that our future digital line-up will tow our market share in Europe. We are also planning to establish a Workshop Centre in Europe to provide service and education related to our products. Upon the completion of this centre, together with implants, dental equipment and digital line-up, we expect to get the momentum which will lead us to No. 6 of market share in Europe in 2023.

The new European Medical Device Regulation, which will come into force in 2020, is currently a big issue in Europe. How is Osstem dealing with this?

We're well aware of the importance of this issue and actively monitoring the situation. Regardless of the current unclear situations that only four Notified bodies are designated and not much details are announced yet, we are equipped with an internal strategy and system to promptly cope with any issues on MDR. In the meantime, we are already committed to the guideline of the new regulation on clinical verification, Meddev 2.7.1. Rev. 4, which is the biggest issue of MDR, and securing clinical data in and out of Korea which meet the conditions of the new regulations. With our commitment to the new regulation and our thorough preparation, we guarantee our products to be provided to our customers no matter where they are.

Thank you very much, Dr Eom, for your time and the insights you offered our readers. *MT*

MIS presents new Clinical Case Competition

MIS has announced an open call for a clinical case competition, to be presented at its next Global Conference in Marrakech, Morocco, in May of 2020. As in previous years, the competition is drawing participants from all over the world, who are currently sending in their most impressive cases. These well documented, expertly photographed cases will be presented in poster form at the conference venue.

With this year's theme being Clinical Application of Novel Concepts, Materials and Technologies in Current Patient Care, clinicians have been encouraged to send in cases that highlight their use of innovations and discoveries which have transformed and influenced their work and the lives of their patients.

The beautiful Palais des Congrès in Marrakech, where the main scientific programme of the conference will take place, will be the showcase for the chosen clinical cases, as well as the stage for announcement of the winners. First, second and third place winners, who will be chosen by the esteemed scientific committee, will receive monetary rewards as well as valuable MIS products.

The 5th MIS Global Conference will take place between 14 and 17 May 2020, and will include a two-day scientific programme of lectures by world-renowned experts, hands-on workshops and a live surgery.

More information
www.mis-implants.com

Last year's Clinical Case Competition aroused great interest among the participants of the MIS Global Conference.

Interview with Jonas Ehinger, CEO and President of Osstell, Gothenburg, Sweden

A new era of global evidenced-based information

Osstell Connect is a free, online portal to be used by dental clinics to collect and store ISQ readings with associated data for overview and easy access of their implant treatments. EDI Journal Project Manager My To talked to Jonas Ehinger, CEO and President of Osstell, who has more than 25 years of experience in the life science and MedTech industry.

Osstell CEO Jonas Ehinger and EDI Journal Project Manager My To during their conversation about the new Osstell Connect online portal.

You have recently launched Osstell Connect. Can you explain what it is and what you have achieved so far?

Osstell Connect is a database in the cloud, enabling a unique and immensely powerful tool for the clinician. This online service is safekeeping implant stability data and related data. But it is also providing relevant key "insights" to allow clinicians to optimize the implant treatment. It contains more than 150,000 implant stability measurements (ISQ readings) currently. It is the only dental technology available to collect, process and present Osstell ISQ measurements on a worldwide basis, exclusively accessible to all Osstell users. Currently, they have fingertip access to 150,000 implant stability measurements, from 75,000 implants placed, in 45,000 anonymized patients with different attributes.

What are the advantages for a clinician to participate?

As you know, a key to better decisions and continuous improvement is about data, leading to knowledge and communication; it is also true in the fields of medicine as well as dentistry. Our goal with Osstell Connect and with all our endeavours is to help by providing tools for guidance and ultimately peace of mind to the clinician – and the patient – with a powerful diagnostic tool. We aim at helping clinicians making more well-founded decisions to provide the best possible care to their patients, based on objective information and evidenced data.

As *Professor Neil Meredith*, co-inventor of Osstell and Resonance Frequency Analysis, puts it, "Osstell Connect not only enables clinicians to save their data securely, safely and in a user-friendly format without the need for local notes or backup, but the database tracks each patient providing useful graphs and information. Osstell Connect provides more than data connected to an individual clinician but will also enable them to compare worldwide information about patients, techniques, implant systems, grafting and much more. As the database grows, Osstell Connect will offer statistics and information collated from its worldwide database that will enable every clinician to identify the best techniques, materials and systems to achieve the highest level of success for their patients." This is what it means to a clinician.

What do you see at the horizon for Osstell and the users of the Osstell Products?

At Osstell, we have always been developing technology based on the input and feedback from clinicians. This is an absolute given going forward as well – this is why we invite all our clinician users to engage with us and provide feedback and ideas to build a new era of global evidence-based information on Osstell ISQ data and osseointegration of implants becoming available through Osstell Connect. It is a very exciting time, and we at Osstell are very convinced that together with all our users and clinician friends across the world, we will be able to transform the diagnostics field once again. Always with the patients as the ultimate priority.

Thank you very much for your time and the insightful interview, Mr Ehinger. *MT*

patient2fan winners discover Salzburg

Post a selfie and win! This call to action and an exclusive competition were used to launch the W&H image campaign 'From a patient to a fan' at the end of 2018. Two trips to Salzburg were given away as the top prize, each for an entire practice team. Now the winners have visited this unique World Heritage Site.

Monika Zwijacz from Poronin, Poland, and *Dr Jorge Nicolás Zancarini Suárez* from San Miguel de Tucumán, Argentina, could hardly believe their luck when they heard that they had won the top prize in W&H's patient-2fan competition. The prize was four days in the enchanting city of Salzburg for two groups of up to six people! World-famous sites and a visit to the W&H headquarters in Bürmoos ensured an unforgettable team event just in time for the start of the summer. "Salzburg is a wonderful city with a unique atmosphere. We were fascinated by the baroque old town, and equally impressed with the visit to the W&H headquarters in Bürmoos. We would like to thank W&H for this experience and for showing us such a wonderful time", said *Monika Zwijacz* about the visit. *Dr Zancarini Suárez* was also delighted with his prize. "We could hardly believe it when we were told that we had won! Travelling to Salzburg with my colleagues was a great adventure. We were pleased with the warm welcome we received at W&H. We were also impressed with the look behind the scenes at how the products are manufactured and assembled".

A big thank you to everybody who took part in the patient2fan competition. All selfies can be found at: patient2fan.wh.com or on Instagram at #patient2fan.

More information
www.wh.com

Photo: W&H

Lucky winners – Dr Jorge Nicolás Zancarini Suárez (right) and colleagues could hardly believe their luck when they won the trip to Salzburg.

Interview with Tom Stratton, CEO Zest Dental Solutions, Carlsbad, California, USA

Focus on the fully edentulous patient

Founded by dental technician Max Zuest in 1972, Zest Dental Solutions is the only manufacturer of the Locator family of attachment systems and a provider of clinician-trusted dental materials and small equipment. Since the beginning of this year, day-to-day operations are led by President and Chief Executive Officer Tom Stratton with whom the EDI Journal had an interesting conversation at the IDS 2019 in Cologne.

Tom Stratton, the new CEO of Zest Dental Solutions: "We are absolutely committed to the end-user, what is the customer asking for?"

Mr Stratton, you have been President and CEO of Zest Dental Solutions since January. What experience in the dental market do you look back on?

I have been in the dental industry for 26 years and see the shift from analogue to digital dentistry so the expectations for precision are even more important now than ever before. That's one reason why I appreciate that we at Zest we have committed to making every piece of the overdenture restoration, for example an abutment and housing, in one manufacturing facility with the same machines ensuring the fit and tolerances meet the needs of digital dentistry.

The digital workflow is something that is rapidly changing dentistry, so having solutions and a product line that can fit into the digital workflow is very important as well.

Is there a difference between Zest and other dental companies as to its mission statement? What is Zest's unique selling proposition?

Our absolute commitment to the end-user. What is the end-user, the customer, asking for? This was apparent to me even when I was the president of two other companies that partnered with Zest. Also, We are an overdenture company with treatment solutions for pre-edentulous and fully edentulous patients. The Zest Locator family of products includes solutions to fit every case beginning with the Locator Root Attachment, the Locator narrow and standard ridge Implant System and the Locator R-Tx Removable Overdenture Attachment System.

It is estimated that 1.6 billion people around the world need an affordable overdenture solution and Zest can deliver a solution to fit every need.

What special products does Zest offer in addition to its flagship product, the Locator?

The previously mentioned Locator Overdenture Implant System called Lodi. This two-part implant system includes a narrow or standard ridge implant with the detachable Locator attachment. The Lodi serves to restore the chewing function of the patient and is suitable for immediate functional integration of the prosthetics. Many of our clinicians use this solution when there is not enough space to fit traditional size implants, or when they want an implant that will only restore with a Locator abutment. Lodi is one of our fastest growing products.

Our two flagship products on the restorative, Danville side of Zest are Bulk EZ, an easy-to-place, dual-cure composite, and PrepStart H2O, the industry's first air treatment unit for anesthesia-free dentistry.

Which strategies will you apply to further expand the growth potential of your company?

Our strategies are clear: First of all, we are going to interact with the end-users the way they want to interact with us. So first and foremost we are going to continue to support our implant manufacturing and distribution partners. We have opened an office in Berlin with the main focus of supporting our distribution partners in Europe.

We have also invested in our business for Special Markets that include DSO's, GPO's dental labs, and other channels with the addition of *Mike Van Nostran* as VP Global Sales. *Mike* will lead an expanding team dedicated to grow and support our key partnerships with Zest. Additionally, we have brought in *David Painter* as our Chief Strategy Officer. *David* has 24 years of dental experience, developing strategic initiatives that help propel the brand forward while supporting our existing partners.

Thank you, Mr Stratton, for your time and the interesting interview. *MT/IL*

Planmeca dental imaging units

In dentistry, image is everything

Your X-ray unit is arguably the most important tool in your dental practice. But how do you achieve a great diagnostic image? If you ask Planmeca's Product Development Manager Mikko Lilja, it's a combination of three Cs: contrast, crispness, and correcting artefacts.

You can't treat what you can't diagnose. You can't diagnose what you can't see. That's why the most important diagnostic tool in the denal office is, arguably, a dental X-ray unit. Both imaging technology and software are making daily strides to reduce doses on the one hand and improve image quality on the other. However, despite the incredible progress made in the last decade, some challenges remain. So how do you achieve a great image? Planmeca Product Development Manager *Mikko Lilja* says it's a combination of three Cs: contrast, crispness and correcting artefacts.

Contrast, resolution and sharpness

In order to take a quality image, you first need a quality imaging unit. Planmeca offers plenty to choose from, from tried-and-true X-ray units to the most advanced 3D imaging devices. Consequently, it is important to look at what kind of device suits your clinical needs – whether it's a solid workhorse unit or a full-featured, fully-capable CBCT device.

In choosing the right imaging unit, *Lilja* mentions looking at devices that "have the baseline image quality – nice contrast, resolution and sharpness." With the additional dimension provided by CBCT, a crisp 3D image can provide an in-depth look at any area of interest, from single implant cases to the entire maxillofacial region.

Zap those pesky artefacts

Although panoramic X-rays have been the norm in dental imaging for a long time, there is only so much you can see from a 2D image of a 3D structure. To achieve a great image, then, a CBCT imaging unit that consistently performs to a high standard is one half of the equation. The other half, however, has to do with what – up until now – has been the Achilles' heel of all types of dental imaging: artefacts and noise. Removal of noise and metal artefact has long been a standard feature of Planmeca imaging units. Two years ago, Planmeca was also the first dental manufacturer to introduce an end-user solution which detects and compensates for artefacts caused by patient movement – Planmeca CALM.

Motion-free image through virtual tracking

Normally, if a patient moves during the scan, the image reconstruction cannot account for it as no information on it is included in the reconstruction process. Planmeca CALM addresses this problem by taking the unwanted movement into consideration. "Basically, we are virtually tracking the motion of the patient," explains *Lilja*, who is also the brains behind the revolutionary algorithm. Indeed, the software has been optimized to handle even the most challenging cases in which offset imaging geometry has been used.

Image is everything

In dentistry, image is everything. Before a single incision is made, an X-ray is always acquired to gauge the area of interest, make a diagnosis and decide what is the appropriate course of action. In order to get the best possible image to answer these purposes, you need an imaging unit which can consistently deliver the three Cs: contrast, crispness and artefact correction.

There is, however, a fourth C which could also be added to the list. Specifically, the third dimension that comes with CBCT can reveal hidden pathology in the mouth and provide new insights into the present condition, improving your treatment planning – and your confidence in it. Essentially, it's about getting everything you can out of one scan and one exposure. And with all four Cs in place, that great diagnostic image can be the one you take. ■

Mikko Lilja, Planmeca's Product Development Manager and the brains behind Planmeca CALM.

More information
www.planmeca.com

Oral Reconstruction Foundation invites you to the Global Symposium 2020 in New York, USA

Big Apple is waiting for you

Mark your calendar for the Oral Reconstruction Global Symposium 2020 at the iconic New York Marriott Marquis. With a world-renowned line-up of speakers from various disciplines, the Symposium under the theme "20/20 Vision" promises to cover a wide range of contemporary issues in implant dentistry and tissue regeneration.

A joint European-American scientific committee consisting of well-known experts such as Dr Edward P. Allen, Professor Fernando Guerra, Dr Craig Misch, Dr Myron Nevins, Professor Robert Sader, and Professor Irena Sailer, will head the Oral Reconstruction Global Symposium 2020.

Three days – Thursday to Saturday – manifold topics
The Symposium will include lectures on extraction site management, tissue regeneration, digital workflow, long-term sustainability, and experts' discussions of challenging cases.

Also planned are a multitude of breakout sessions and hands-on exercises on topics like:

- Digital workflow
- Immediate full-arch treatment
- L-PRF applications
- Hard and soft tissue grafting
- Immediate placement and temporization
- Prevention and management of peri-implant diseases

The Symposium starts on Thursday afternoon and ends on Saturday with a big Gala.

Meet friends in New York
The Global Symposium offers the perfect opportunity to stay abreast of the latest treatment options while enjoying time with colleagues in the heart of Times Square. We look forward to seeing you there!

More information and registration
www.orfoundation.org/globalsymposium

Photo: pixabay

Interview Dr. Eirik Aasland Salvesen, Stavanger, Norway

"Probably the Swiss knife of dental implants"

At the IDS 2019 in the Straumann Arena, My To from the EDI Journal spoke with Dr Eirik Aasland Salvesen from Stavanger, Norway. Dr Salvesen holds a specialist degree in periodontology and is lecturing worldwide on topics like implantology, periodontology as well as hard and soft tissue management. He is the partner and co-founder of Oris Dental, the second largest DSO in Norway, and has been applying immediate procedures already from the very beginning. Dr Salvesen was one of the very first clinicians to gain relevant practical experience with the brand new BLX immediate implant from Straumann.

Immediate protocols are an important focus of your practice. Which have been your key learnings in the last years?

Immediacy is a very appealing approach for patients and therefore an important aspect of your practice marketing. Clinician however need specific knowledge and the right tools. For example, the fully tapered implants really open new treatment opportunities but the products available so far were delicate to use in some situations.

You are an early user of a new arrival in this segment of fully tapered implants, the BLX from Straumann – what makes it special?

The BLX is a very fortunate combination of using all the knowledge on fully tapered designs of the last 10 years, with some specific Straumann strengths like the Roxolid material or the SLActive surface technology. They have really taken their time to develop an accomplished product and to collect an imposing amount of clinical experience before market launch.

How clinically relevant are the differences between the BLX and the older implants in the market?

There are surprisingly clear differences. High primary stability is achieved with the BLX in a predictable manner but, thanks to reduced compression, without the risk of extreme torques at final positioning.

The new VeloDrills generate markedly less heat than traditional drills, which allows for a very short drill protocol. And BLX is indicated for all tooth positions already at 3.75 mm diameter, this preserves tissue and offers more flexibility how to place the implant.

How about the prosthetic features of the new BLX?

For diameters from 3.5 mm, there is only one connection type between implant and prosthetic components, which significantly reduces the complexity. The specific connection design allows a large choice of slim and under-contoured abutments, preserving as much soft tissue as possible for an esthetic end result. All emergence profiles are available even for the temporary phase.

Is the new BLX, like the previous fully tapered implants, mainly reserved for specialists like you?

Interestingly, this new implant suits perfectly also the needs of clinicians with little experience. The BLX has the typical self-cutting properties of fully tapered designs but is forgiving in clinical use. It follows the intended path in a very controllable way - an obvious asset compared to the demanding behavior of other fully tapered implants.

Add to this the simple drill protocol and the compatibility with all restorative and digital solutions offered by Straumann, and BLX becomes an ideal start to your implant journey - but with the potential to grow later on into complex clinical protocols. The BLX really is an implant for all indications and for all clinicians.

Thank you for your time and the interesting interview, Dr Salvesen.

MT

Dr Eirik Aasland Salvesen

Interview with Julien Benhamou, CEO of TBR Dental, Toulouse, France

An entire digital portfolio

TBR is an international company with headquarters based in France. It has specialized in the design, manufacture and marketing of unique dental implant solutions for over 30 years. The EDI Journal met with its CEO Julien Benhamou.

Julien Benhamou, CEO of TBR Dental

What does your company stand for? What's your core philosophy?

TBR is famous for our very innovative and unique Z1 tissue level implant with a zirconia collar. For over 30 years, TBR shares the same ambitions with dentists: to offer patients the best possible functional and aesthetic restorations and to boost their practices with innovative products like the Z1 implant. Today, the Z1 implant offers a highly aesthetic, protective and long-lasting solution, thanks to the zirconia collar at gum level, which mimics the colour of natural teeth. This is a benefit that the patients understand and love!

What are the evolutions and trends in your market?

The dental universe is definitely going to two directions : tissue level implants and digital. With technology developing fast, digital dentistry will become more efficient and user-friendly, allowing dental professionals to work in even smarter ways than before. The development of digital hardware makes possible to design and mill prosthetics, abutments, crowns, bars, and bridges using computers, saving time and increasing accuracy. Tissue level implantology and digital brings new challenges and it is a real opportunity for a dental player such as TBR!

How does your company intend to position itself in this high-potential CAD/CAM market?

Thanks to our unique implant system Z1 with an integrated zirconia collar, TBR is the only company able to combine an open and user-friendly digital workflow with a unique tissue level implant system. Our teams have been working for several months to develop and propose a new range of products and services dedicated to digital workflow. The use of this state-of-the-art equipment is perfectly combined with our range of products dedicated to implant and aesthetic restorations. This project is now ready to hit the market! We are proud to announce the launch of the new TBR subsidiary called Index Dental!

What will be the main mission of this new subsidiary?

Index Dental will offer an open, premium and approved range of products and services dedicated to the digital field in partnership with top digital equipement manufacturers. The digital development in dentistry brings the need for an entirely new set of skills for dental professionals, we will be by their side to help them in this transition.

As soon as it is officially launched, within a few weeks, TBR will offer through Index Dental, an entire digital portfolio. This portfolio extends from scanning stage, with intra-oral scanners and CBCTs, to milling stage, with small, medium and large capacity milling units (chairside and labside), including adapted CAD and CAM softwares, materials and associated consumables.

How do you see the future of TBR?

The combination of te Z1 unique tissue level implant with a zirconia collar with the Index Dental digital workflow will be a unique global tissue level solution in the market. Dental professionals will benefit from a smoother and more flexible workflow, reduced cost and time, improved accuracy and a high level of predictability.

The digital era combined with innovative tissue level implant is booming, so we invite all the dental professionals looking for strong innovation to join us and benefit from a unique implant and digital solution that their patients will understand and love !

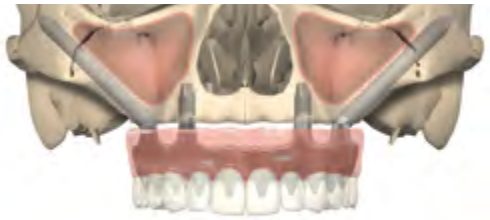
Based on this analysis, the TBR Group will continue to grow through selected acquisitions of innovative companies and synergistic partnerships with internationally renowned companies.

Mr Benhamou, thank you very much for this interview. *MT*

NobelPro Line

Mastering the extreme

Since Paulo Malo treated the first patient with the fixed, full-arch All-on-4 treatment concept back in 1998, over 150,000 patients [1] have been successfully treated [2]. With the NobelPro Line product range, clinicians can take the All-on-4 treatment concept to new heights for even more patients.



NobelPro Line is a selection of existing products and training for advanced users of the All-on-4 treatment concept. The comprehensive assortment of clinically successful and proven treatment options includes NobelParallel CC, NobelSpeedy, NobelZygoma, NobelProcera bars and a full range of Multi-unit Abutments and accessories, allowing clinicians to master even the most challenging cases, including cases with moderate up to severe resorption [2–5].

The ability to achieve treatment success in such extreme cases depends not only on products, but on the level of professional knowledge. In addition to existing courses, tailored training in the NobelPro Line range is in development for advanced clinicians in order to enhance their skills in edentulous treatment, from common cases to the extreme. This will include a special programme for clinicians who have recently started the All-on-4 treatment concept and are looking to expand their treatment offering into more challenging cases. New training opportunities will be announced before the end of the year.

A knowledge-sharing platform

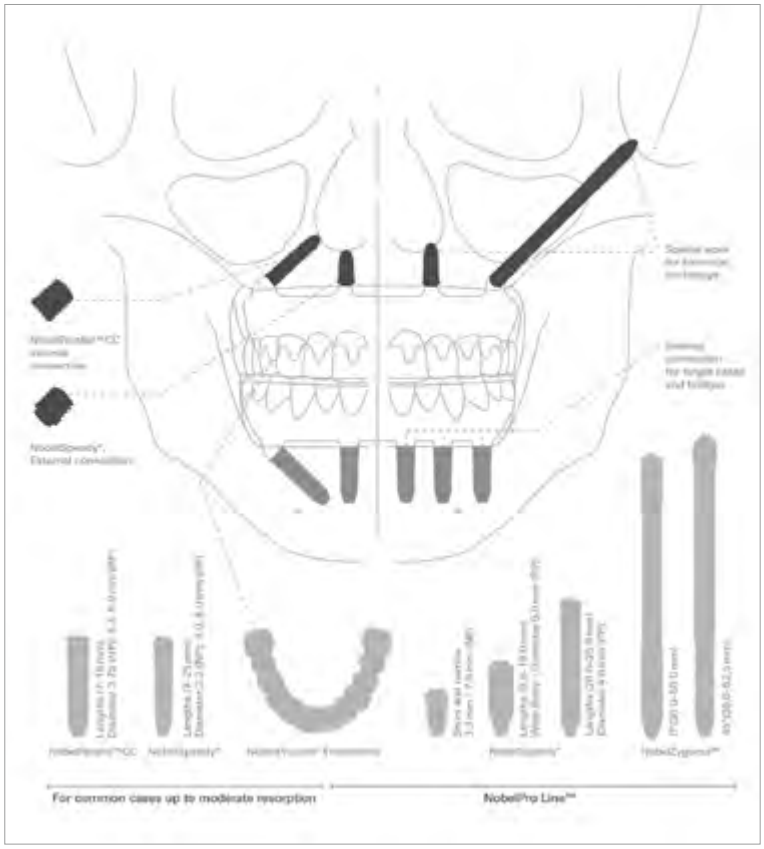
Professional development for highly advanced clinicians in fully edentulous treatment is intended to go far beyond conventional training. To further advance their expertise in NobelPro Line, the development of a community of highly proficient specialists is planned in order to provide new knowledge-sharing opportunities. A number of world-renowned experts will participate, including the inventor of the All-on-4 treatment concept himself, *Professor Paulo Malo*. More details will be announced in the coming months.

Professor Paulo Malo said,"NobelPro Line is a group of products that allow more experienced professionals to treat more complex cases. For example, cases with soft bone, extremely soft bone, reduced bone height, reduced bone thickness and other situations that most implants do not allow. NobelPro Line is the most comprehensive line in the market today."

The references are available at www.teamwork-media.de/literatur

More information

www.nobelbiocare.com/proline



With the comprehensive NobelPro Line product range, clinicians can adapt for almost any situation, from common cases to severe resorption.

Aesculap ExtraLux

Product
ExtraLux
dental instruments

Indication
Tissue-conserving
tooth extraction

Distribution
Aesculap AG
Am Aesculap Platz
78532 Tuttlingen
Germany
www.aesculap-dental.de

With ExtraLux, Aesculap is offering a new generation of instruments that enables particularly tissue-friendly extraction of teeth.
Especially in implantology, time-consuming bone augmentations can be avoided with tissue-conserving extractions. ExtraLux instruments have sharp working ends for cutting through the holding apparatus. A thin cross-section makes it possible to cut Sharpey's fibers without damaging the bone and to access the PA gap easily. The ergonomic shape offers a good power dosage and grip even during the operation.

ExtraLux is available in six different versions, which can be individually selected for an extraction depending on the indication.

Medentika Enlarged prosthetic portfolio

Product
Implant prosthetic
components

Indication
Dental implantology

Distribution
Medentika GmbH
Hammweg 8–10
76549 Hügelsheim
Germany
www.medentika.com

New products are an expression of comprehensive expertise and take special account of the requirements of customers and their patients. With the OT-series, Medentika presents its new series, especially to also serve the needs of its customers in the Asian market. The new series is already available and will be further expanded this year. Due to the extensive range of prosthetic components, the restorations can be designed both individually and aesthetically. The OT-series is compatible to the following implant systems: Osstem Implant/TS-System, HiOssen Implant/ ET-System, T-Plus Implant Tech/ A+ Implant/ ST Implant.

In addition to the pure conical components for the Astra implants, Medentika also offers components with indexed geometry now. The index is used to place the abutments in the implants in one of six possible positions. The conical connection also ensures optimum stability and bacteria seal.
The Y-series is compatible to the following implant system: Dentsply Implants/ Ankylos C/X.

Osstem OneMS Kit

Placing implants in the anterior area can be very challenging due to limited interdental space and aesthetic considerations. To deal with this issue, various 2- or 3-mm one-body mini-implants are available on the market. However, even with mini-implants, it is difficult to achieve the right position and angulation. As a convenient solution, Osstem Implant is offering OneMS Kit, which helps the practitioner to obtain predictable and aesthetic results in the anterior area.

OneMS Kit enables the stable placement of mini-implants with diameters of 2 to 3 mm in narrow interdental areas with only 5 mm bone width. Thanks to the digital concept, the practitioner will be able to place implants in the aesthetic zone confidently. All steps are secured by precisely customized templates based on the CT and oral scan data of the patient. The template guarantees safe drilling and accurate implant placement. All drills and drivers have a size of 3.5 mm contact part which fits exactly in the 3.6 mm guide hole. The perfect fit gives high stability and ensures safe drilling.

The OneMS Kit consists of all components required for mini-implant placement: tissue punch for flapless surgery, MS drills with different diameters (1.5/1.8/2.3/2.7 mm) and lengths (8.5/10/11.5/13 mm), placement drivers, and other needful tools such as torque wrench and depth gauge. ■

Product
Mini-implant placement kit

Indication
Guided implant placement

Distribution
Deutsche Osstem GmbH
Mergenthalerallee 35–37
65760 Eschborn
Germany
www.osstem.de

Dentaurum Implants Titanium adhesive bases

Dentaurum Implants, one of Germany's centers for precision engineering, develops and manufactures its products true to the motto "Quality – made in Germany". The CAD/CAM titanium adhesive bases are one of the latest developments for the implant system tioLogic Twinfit which was launched in January 2019.

The new CAD/CAM titanium adhesive bases are especially suited for the bonding of multi-unit bridge restorations or full-arch restorations on tioLogic Twinfit implants in the edentulous mandible or maxilla. They have a platform connector geometry which ensures that the prosthesis sits optimally. There is no rotational security to enable maximum freedom when positioning the base on the implant. The cone is 3.2 mm high and has retention grooves which enhance the effect of the adhesive on the cone. The titanium adhesive bases are constructed in such a way that implant divergencies of up to 30° can be compensated. By using the bonding technique, the ceramic bridges, manufactured using CAD/CAM, can be fitted passively.

Data sets for 3Shape, exocad and dental wings are available as downloads for digital construction at the Dentaurum Implants website. ■

Product
CAD/CAM titanium adhesive bases

Indication
Dental implant prosthetics

Distribution
Dentaurum Implants GmbH
Turnstr. 31
75228 Ispringen
Germany
www.dentaurum-implants.de

Calendar of Events

	Event	Location	Date	Details/Registration
9/2019	**EAO 2019 Annual Scientific Congress**	Lisbon Portugal	26–28 September 2019	FDI World Dental Federation) www.fdiworlddental.org
10/2019	**Dentsply Sirona World**	Las Vegas, NV USA	3–5 October 2019	Dentsply Sirona www.dentsplysironaworld.com
	1st European Congress for Ceramic Implant Dentistry	Zurich Switzerland	11–12 October 2019	European Society for Ceramic Implantology ESCI www.esci-online.com
	Osstem HiOssen European Seminar	Prague Czech Rebublic	18–19 October 2019	Osstem Implant www.osstem.de
11/2019	**BTI Day Vitoria**	Vitoria-Gasteiz Spain	9 November 2019	BTI Biotechnology Institute www.bti-biotechnologyinstitute.com
	Digital Dentistry Week	Freiburg Germany	16–20 November 2019	Camlog Biotechnologies GmbH www.camlog.com
	ADF 2019 French Dental Association Annual Meeting	Paris France	26–30 November 2019	Association Dentaire Française www.adf.asso.fr
02/2020	**15th BDIZ EDI Expert Symposium**	Cologne Germany	23 February 2020	BDIZ EDI www.bdizedi.org
04/2020 05/2020	**Nobel Biocare Global Symposium**	Las Vegas USA	15–18 April 2020	Nobel Biocare www.nobelbiocare.com
	Oral Reconstruction Global Symposium	New York City USA	30 April–2 May 2020	Oral Reconstruction Foundation www.orfoundation/globalsymposium
	ITI World Symposium	Singapore	14–16 May 2020	ITI International Team for Implantology www.iti.org/worldsymposium2020/
	MIS Global Conference	Marrakech Morocco	14–17 May 2020	MIS Implants www.misimplants.com

EDI Journal – Information for authors

EDI Journal – the interdisciplinary journal for prosthetic dental implantology is aimed at dentists and technicians interested in prosthetics implantology. All contributions submitted should be focused on this aspect in content and form. Suggested contributions may include:
· Original scientific research
· Case studies
· Product studies
· Overviews

Manuscript submission
Submissions should be made in digital form. Original articles will be considered for publication only on the condition that they have not been published elsewhere in part or in whole and are not simultaneously under consideration elsewhere.

Manuscripts
Pages should be numbered consecutively, starting with the cover page. The cover page should include the title of the manuscript and the name and degree for all authors. Also included should be the full postal address, telephone number, and e-mail address of the contact author.
Manuscripts can be organized in a manner that best fits the specific goals of the article, but should always include an introductory section, the body of the article and a conclusion.

Illustrations and tables
Each article should contain a minimum of 20 and a maximum of 50 pictures, except in unusual circumstances. Our publishing house attaches great importance to high quality illustrations. All illustrations should to be numbered, have a caption and be mentioned in the text.
The photos should have a size of 10x15 cm, the image or graphic files must have a resolution of 300dpi. Tiff, eps and jpg file formats are suitable. Radiographs, charts, graphs, and drawn figures are also accepted.
Captions should be brief one or two-line descriptions of each illustration, typed on a separate page following the references. Captions must be numbered in the same numerical order as the illustrations.Tables should be typed on a separate page and numbered consecutively, according to citation in the text. The title of the table and its caption must be on the same page as the table itself.

References
Each article should contain a minimum of 10 and a maximum of 30 references, except in unusual circumstances. Citations in the body of the text should be made in numerical order. The reference list should be typed on a separate sheet and should provide complete bibliographical information in the format exemplified below:
[1] Albrektsson, T.: A multicenter report on osseointegrated oral implants. J Prosthet Dent 1988; 60, 75-82.
[2] Hildebrand, H. F., Veron, Chr., Martin, P.: Nickel, chromium, cobalt dental alloys and allergic reactions: an overview. Biomaterials 10, 545-548, (1989)

Review Process
Manuscripts will be reviewed by three members of the editorial board. Authors are not informed of the identity of the reviewers and reviewers are not provided with the identity of the author. The review cycle will be completed within 60 days. Publication is expected within nine months.

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Editors office:
teamwork media GmbH
Hauptstr. 1
86925 Fuchstal/Germany
Phone: +49 8243 9692-0
Fax: +49 8243 9692-22
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