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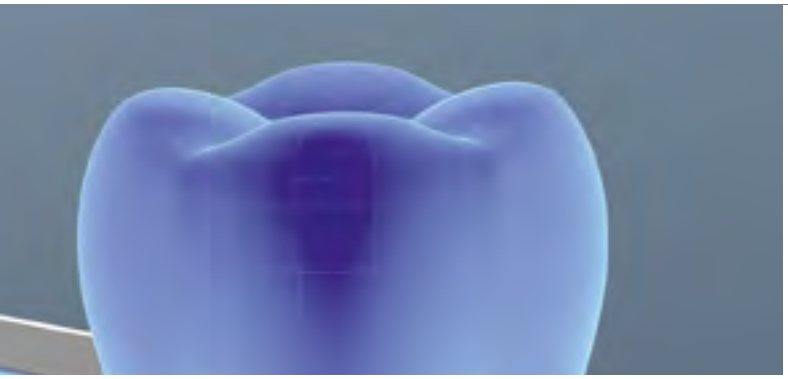
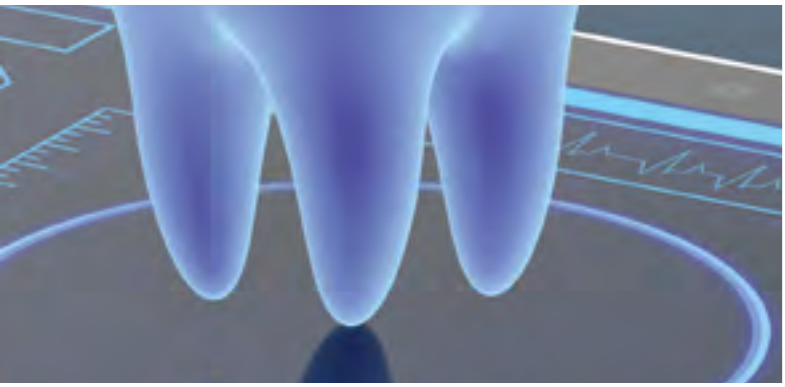
Issue 4/18

EDI Journal

European Journal for Dental Implantologists

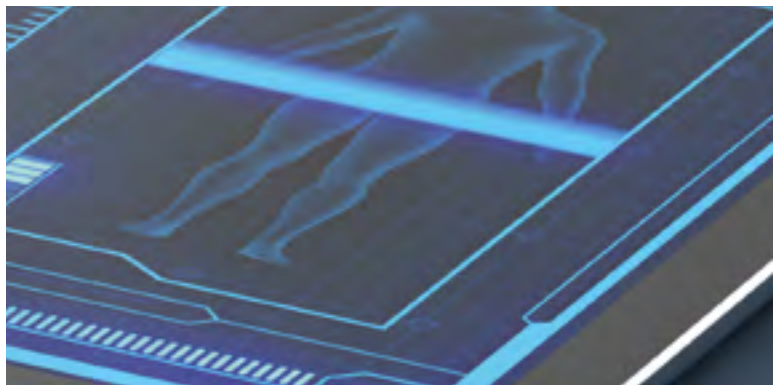




TOPIC

Where are we today?

Digital technology in implantology and implant prosthodontics



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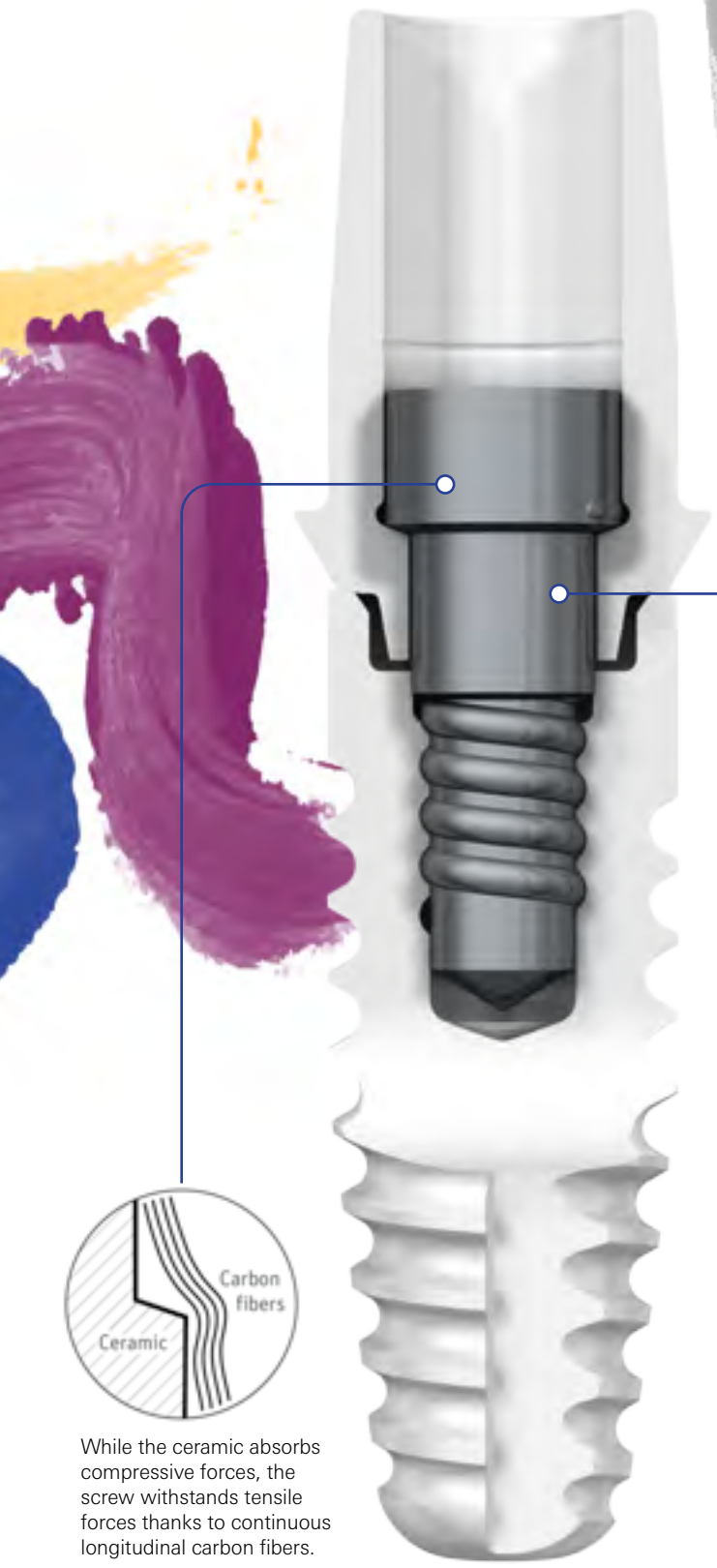

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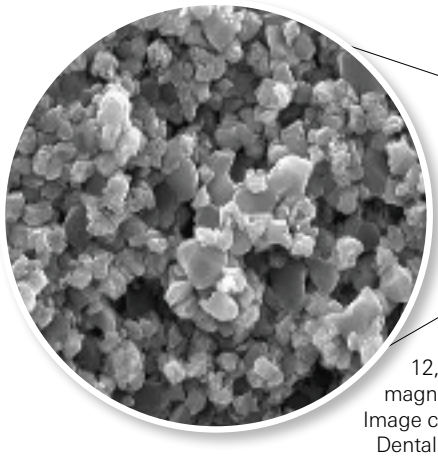


12,000x magnification
Image courtesy of Dentalpoint AG

4 Chappuis V, Cavusoglu Y, Gruber R, et al. Osseointegration of zirconia in the presence of multinucleated giant cells. Clin Implant Dent Relat Res 2016; 18(4):686–698.
5 Jank S, Hochgatterer G. Success rate of two-piece zirconia implants: a retrospective statistical analysis. Implant Dentistry: 2016; 25(2):193–198.

Hello there, 2019!

Everything will be fine in the end. And if it's not fine, it's not yet the end. In Europe, optimism currently exists only in trace elements, that's why we have borrowed from Oscar Fingal O'Flahertie Wills, Irish poet and playwright, better known as Oscar Wilde.

Whether Brexit and everything is going to be fine for Europe and Great Britain is anybody's guess. One thing people are beginning to realize is that there are only losers and no winners. Only die-hard nationalists and some politicians on the island can see the renunciation of Europe as tantamount to the rebirth of the British Empire. Pessimism is spreading. Nor does British Finance Minister *Philip Hammond* contribute to a better overall mood. Britain's economy would be better off without the withdrawal from the EU, he told the BBC in an interview. Surveys show that it is widely believed that the British National Health System (NHS) will be severely affected because EU doctors and nursing staff have long since begun to pack their bags.

On 11 December, the British Parliament is set to decide on the Brexit agreement. But before then – as many Brexit opponents hope – an expert consultant of European Court of Justice (ECJ) could offer a different take. The question is whether Great Britain could theoretically withdraw from its withdrawal from the EU pursuant to Article 50 of the Lisbon treaty. The ECJ announced in late November that *Manuel Campos Sánchez-Bordona*, the Spanish Advocate General, had been asked to prepare a legal opinion. Based on this opinion, the ECJ is planning to make a final decision – before the Brexit vote in the British Parliament, if at all possible. The background for this is a request from the Scottish Supreme Court of Session, which had received an appeal by members of the Scottish, British and European Parliaments. The MPs want to know whether there is a theoretical third alternative to either parliamentary approval of the withdrawal agreement or EU withdrawal without an agreement ("hard Brexit"). That would mean for Britain to withdraw from its withdrawal and stay in the EU. So, is everything going to be fine in the end?

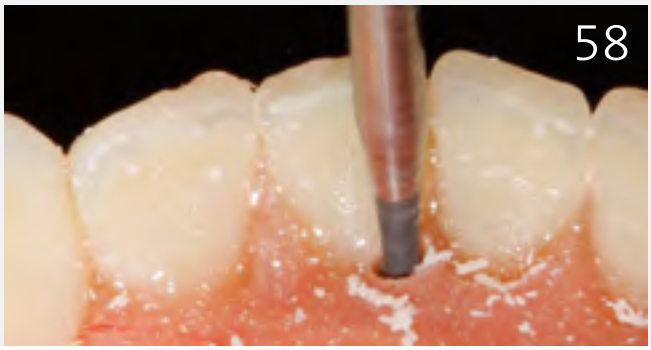
From one thing to another: The year 2018 is relentlessly drawing to a close, for BDIZ EDI as for everyone else. In retrospect, it was a good year. Of course, the General Data Protection Regulation (GDPR) has been keeping both BDIZ EDI as an association and individual dentists busy. As GDPR continues to spread uncertainty, we have provided answers and offered support as best we could.

We believe that the association is well positioned to face the upcoming challenges as we enter the year 2019. Our delegates to various guideline conferences contribute the professional competence of knowledgeable and versatile oral implantologists. BDIZ EDI has been able to sign up additional partner associations in Europe. With the annual Guidelines of our European Consensus Conference, we also provide advice on current and complex issues within implantological treatment. We just completed another Curriculum Implantology in Greece, the next one is already under preparation. In Germany, the 19th Curriculum Implantology concluded in the summer, bringing the total number of participants to over 500 in more than twelve years. We have stayed in contact with our Curriculum graduates, and most graduates are now members of the extensive BDIZ EDI family. And according to our most recent survey, our members are highly satisfied with our work.

BDIZ EDI will celebrate its 30th anniversary in 2019. We are looking forward to the year 2019 with the Expert Symposium and the European Consensus Conference in Cologne, with our participation at the International Dental Show (IDS), also in Cologne, with another Europe Symposium and with various appearances of our association and its board members at oral implantology congresses worldwide. There will be new challenges for the association and we will continue to answer your questions on topics such as the digital transformation, which is already the main topic of the present issue of the EDI Journal, but also on the GDPR and the EU services package for the health sector. You can take our word for it!

Sincerely,
Christian Berger, Kempten/Germany
President of BDIZ EDI

Surgical template with open sleeves.



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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

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Managing Director: Uwe Gösling

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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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2018 World Dental Federation (FDI) congress in Buenos Aires

The goal: Improving oral health worldwide

It is the big picture, the global approach, that is on the agenda when the World Dental Federation (FDI) holds its World Dental Congress. This year, the Congress and FDI General Assembly took place in Buenos Aires, Argentina, at the beginning of September. The 4,000 participants were joined by dental delegates from 130 countries committed to equal opportunity for (dentally) underserved people – in line with the FDI Strategy 2018–2021.

While the Congress traditionally addresses all disciplines of dentistry, with a particular focus on prophylaxis, the FDI's health policy committees are concerned with the (oral) health of all people and in particular with the medically and dentally underserved segments of the world population. By analogy with the WHO, urgent global dental issues are discussed and positions adopted. In 2017, the FDI Strategy 2018–2021 was launched in Madrid, now implemented in Buenos Aires. What must be demanded and realized from a dental point of view in order to address global health problems? Increasing resistance to antibiotics, increasing sugar consumption and, above all, the consequences of global refugee and migrant movements on the health status of those affected, and thus also on health systems, were the focus of discussion in Argentina's metropolis.

With its Strategy 2018–2021, the FDI has called for more action to reach those segments of the world's population that are medically underserved, and to include those affected by increasing numbers of refugees and migrants. A political resolution addressed to the G-20 summit, which met in Buenos Aires in October, is therefore being developed. The draft was submitted by the German delegation. It calls on G-20 leaders and their health ministers to work to encourage and support all governmental and non-governmental health organizations worldwide, and dental organizations in particular, to address this public-health emergency. Not least against the background of increasing refugee and migrant movements, all relevant stakeholders are invited to play an active role in supporting United Nations Sustainable Development Goal 10, namely to reduce inequal opportunities in the health sector.

Above (from left): The FDI Council with Speaker Dr Susie Sanderson (UK), Executive Director Enzo Bondioni (Switzerland), President Dr Kathryn Kell (USA), President-elect Dr Gerhard Seeberger (Italy), and outgoing Treasurer Dr Jack Cottrell (Canada). Right side: Delegates from 130 countries voted on the resolutions prepared in the forums and committees.

Resolutions

The FDI General Assembly's strategy papers, adopted by an overwhelming majority, aim to improve global oral health, putting into more concrete terms some of the decisions taken a year ago in Madrid. Here, too, equal opportunity in health is paramount.

- The World Dental Federation wants to take measures to achieve more equal opportunity in health internationally. At a time when the number of refugees has reached a record high, measures to improve health care and strengthen health systems in developing countries should be promoted.
- The FDI also takes into account the dangers posed by the increasing number of antibiotic resistances. It advocates the responsible use of antibiotics and recommends that these drugs should only be prescribed and dispensed by qualified staff, eliminating the possibility of sales on the internet and over the counter.
- The high sugar consumption worldwide prompted the General Assembly to pass a resolution supporting the demands of the World Health Organization (WHO) for reducing the sugar intake and to strengthen education in this area through campaigns.

Revised FDI opinions are being published in the following areas:

- In the light of current reports to the contrary, the FDI defends and substantiates the scientifically proven benefits of fluoridated toothpaste and calls on the countries to guarantee access to fluoridated toothpaste in order to fight dental caries.
- Dental amalgam phase-down: The FDI supports the reduction of the use of amalgam in dentistry, while supporting WHO efforts to step up preventive efforts and promote research into alternative treatments.
- On the basis of the Istanbul Declaration on dentistry as an integral component of general health, the FDI calls on all national dental associations to publicly emphasize the importance of the work dentists perform in health care and to integrate general health aspects into dental curricula.
- In its statement entitled "Global Periodontal Health", the FDI recommends the new classification of periodontal and peri-implant diseases revised in 2018 and presented by the European Society of Periodontology (EFP) at Europerio9 in Amsterdam.

AWU

ERO: The European arm of the FDI

The European Regional Organization (ERO) is a sub-organization of the FDI and represents the interests of dentists from 53 European countries. The aim is the free choice of treatment and a dentist-patient relationship without interference by third parties. The General Assembly of the ERO takes place within the framework of the FDI World Congress. Dr Michael Frank (Frankfurt, Germany), President-elect of the ERO, gives insights into the work of the organization.

What influence does the ERO have on what the FDI General Assembly decides?

The European Regional Organization (ERO), together with the representations in the Asia-Pacific (APRO), Africa (ARO), Latin American (LARO) and North America (NARO) regions, is one of the FDI's sub-organizations. Since four of the seven most important industrial nations are part of Europe, the influence of this continent in the World Dental Federation is of course similarly extensive as in world politics. The influence of the European dental profession, and in particular of the German delegation, can be felt above all in the main topics that we bring to the international debate. At present, this is primarily the question of adequate medical care for people who are underserved by European standards and the issue of oral health among migrants.

What were the topics of the ERO in Buenos Aires?

During the congress, sessions were held with activity reports from the various working groups, including the Dental Team Practice 2030 working group, which I manage as a supervisor. This group is concerned with the effects of technological and

Dr Michael Frank

socio-political changes on the way dentists will exercise their profession in the near future. While this change affects the high-tech countries of Europe more than, for example, African countries, in the age of globalization, all changes are felt all over the world. Another topic on which there were reports was the question of ageing populations and the challenges demographic change poses to medicine and dentistry.

What issues will the ERO have to address in the future, after you have taken office as president?

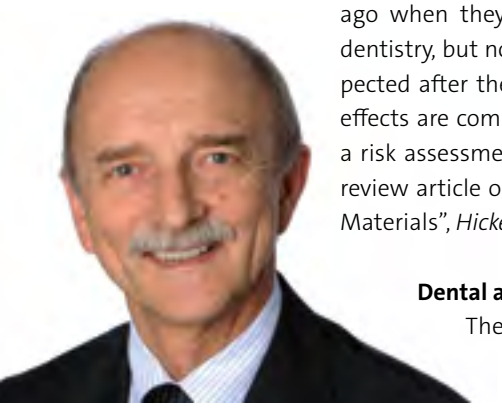
A topic that poses problems not only in Germany but also throughout Europe is medical care centres (MCCs), which are often backed by powerful financial investors. When medicine becomes an investment, it will no longer be primarily dedicated to the best possible care for patients but to profits. At the ERO Plenary Session, the president of the Spanish dental association reported a boom of MCCs and an increasing number of cases where patients had to make advance payments for future treatments that were never performed because the company owning the MCC had disappeared from the market. This must not happen. The dental profession must influence the political process and highlight the problematic implications of the current legal situation on health care and on patients. In Buenos Aires, a pertinent resolution submitted to the meeting by the German delegates was passed unanimously. Another topic will be better coordination and co-operation with the Council of European Dentists (CED), the political representation of dentists of the member states of the European Union in Brussels.

Thank you very much, Dr Frank, for your interesting comments.

AWU

Nanoparticles under the microscope

Professor Reinhard Hickel, Dean of the Faculty of Medicine of the University of Munich and Director of the Department of Restorative Dentistry and Periodontology, is an active member of the FDI Science Committee and heads the Dental Materials Task Team (DMTT). For the Buenos Aires World Dental Congress, the team prepared statements on the amalgam phase-down and nanoparticles, both of which were adopted by the FDI General Assembly with overwhelming majorities.



Professor Reinhard Hickel

The Dental Materials Task Team was set up by the FDI in September 2015 to address primarily the issue of dental amalgam. The team today consists of *Reinhard Hickel* (Germany), *John E. Dahl* (Norway), *Thomas Hart* (USA), *Mutlu Özcan* (Switzerland), *Michael Sereny* (Germany) and *Junji Tagami* (Japan) as chair.

"Nanoparticles were highly praised 15 to 20 years ago when they were introduced into restorative dentistry, but now – as could almost have been expected after the hype – concerns about their side effects are coming into focus. We have carried out a risk assessment and published a comprehensive review article on the subject in the journal Dental Materials", *Hickel* explained.

Dental amalgam phase down

The DMTT was the driving force behind the dental amalgam phase down resolution, drafted in Madrid and modified in Buenos Aires. Not an easy task, given the background of different perspectives in Europe, Japan and America on how the dental amalgam issue should be approached. Ultimately, the team was able to chisel out a common wording with representatives from the USA and other countries, which largely preserves the German position but is nevertheless amenable to consensus. The FDI General Assembly supports the phase-down of dental amalgam in dentistry while supporting WHO efforts to promote prevention and research into alternative treatments. Next year's World Congress will be held in San Francisco. Until then, it's up to the team to make preparations. In San Francisco, the DMTT will have to provide scientific opinions on the repair of dental restorations and the initial treatment of lesions – based on the Dental Amalgam Phase-Down policy statement, which recommends that dental amalgam should not be used for initial treatment.

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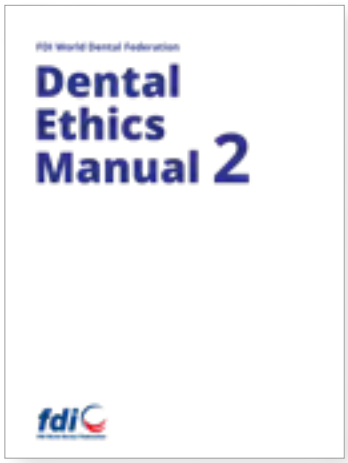
Launched at the FDI World Dental Congress in Buenos Aires

Dental Ethics Manual 2

The Dental Ethics Manual 2 launched at the FDI World Dental Congress in Buenos Aires prepares dental practitioners to confront important ethical dilemmas and uphold an exceptional standard of care throughout their careers. It is user-friendly and relevant to a wide and international audience, including experienced clinicians, first-year dental students, dental office managers, or policymakers.



During its 2018 Word Dental Congress, held in Buenos Aires, Argentina, the FDI World Dental Federation released the second edition of its Dental Ethics Manual. More than 10,000 printed copies were distributed of the first edition, published in 2007, and countless downloads occurred of the online version.

Not simply an update

The new Manual is not simply an updated version, but a completely redesigned and rewritten manual. Following the adoption by the FDI General Assembly in Bangkok in 2015 of a policy document on the FDI's role in promoting dental ethics, an international team of experts worked for three years to design and draft a new edition. The members included *Wolter Brands* (Netherlands), *Sudeshni Naidoo* (South Africa), *Suzette Porter* (Australia), *Michael Sereny* (Germany), *Ward van Dijk* (Netherlands/FDI), and *Jos Welie* (USA). Organizational assistance was provided by *José Ibarra* (Switzerland/FDI).

The team began by developing an update of the FDI's 1997 "International Principles of Ethics for the Dental Profession". The new principles statement, which incorporates all key ethical positions adopted by the FDI in the past two decades, was subsequently adopted by the FDI Council to form the basis of the new Manual. Whereas the first edition was authored completely by medical ethicist *John Williams* with editorial input from an international team, the new Manual is explicitly a multi-authored interdisciplinary project. The overall structure and table of contents of the new Manual were designed by the whole team. Each chapter was then drafted by one of the team members, followed by extensive review and discussion by all.

As was true of the first edition, the new Manual has two primary target audiences:

1. practicing dentists and
2. dental students and their ethics instructors.

That also means that neither target audience will find all of its needs met. For example, the new Manual neither strives to provide an encyclopedic review of all ethical challenges that commonly arise in dental practice, nor does it provide dental students with a thorough review of the theoretical foundations of an ethical analysis. Instead, it seeks to inspire ethical reflection, facilitate ethical analysis, and promote ethical discussion in the dental office, the clinic, and the class room.

Consistent with the mission of the FDI, the Manual is intentionally international in its design. Whereas the legal rules that apply to dentistry are always relevant within national borders only, the Manual focusses on the ethical norms that define the practice of dentistry itself across such borders. The reader hence will find few references to laws or even national codes of ethics. Clinicians consulting the Manual must be mindful of this limitation, and instructors of dental students will have to complement this Manual with readings that cover national rules and regulations.

Download the new edition of the Manual free of charge at:

https://www.fdiworlddental.org/resources/manuals/dental-ethics-manual-2

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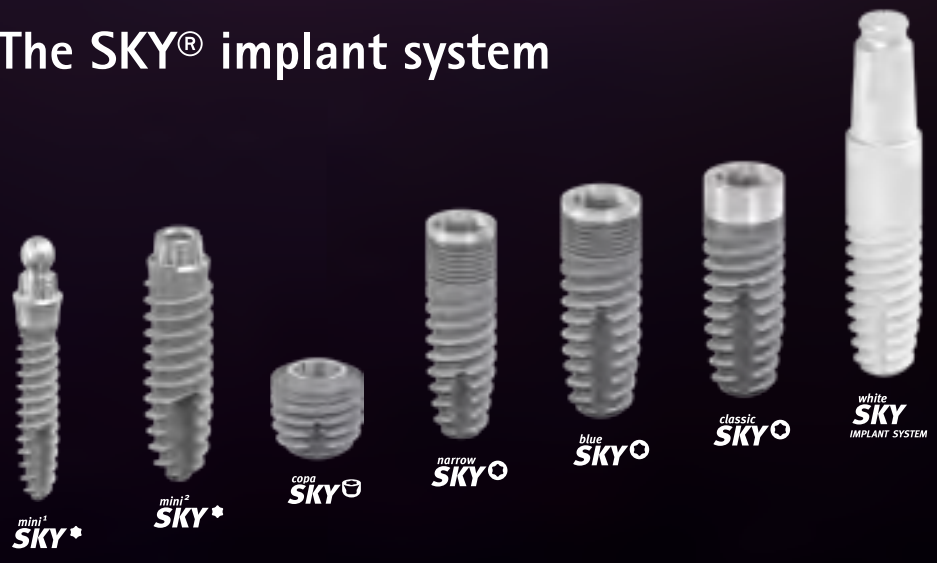

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Delegates from over 80 countries shared best practice in dental implant therapy in Vienna

EAO congress broke new ground

More than 3,000 delegates from 80 countries took part in the annual congress of the European Association for Osseointegration (EAO) in Vienna, Austria. The renowned three-day event drew to a close with a glittering awards ceremony celebrating cutting edge research in implant dentistry.

Following three packed days of presentations, the EAO awarded seven prestigious European scientific prizes:

- European Prize for Basic Research in Implant Dentistry. Awarded to: *Ralf Kohal* (Germany)
- European Prize for Clinical Research – Surgery. Awarded to: *Stefan Bienz* (Switzerland)
- European Prize for Clinical Research – Prosthetics. Awarded to: *Carina Boven* (The Netherlands)
- European Prize for Clinical Research – Peri-implant Biology. Awarded to: *Marco Clementini* (Italy)
- European Prize for Research in Implant Dentistry: Poster Presentation. Awarded to: *Balazs Feher* (Austria)
- European Prize for Clinical Innovations in Implant Dentistry. Awarded to: *Simone Cortellini* (Belgium)
- European Prize for Clinical Video on Implant Dentistry. Awarded to: *Veronica Pohl* (Germany)

During the opening ceremony, the congress chairs took the audience on a journey through time. From left: Michael Payer (co-chairman), Ronald Jung (chairman), and Georg Mailath-Pokorny (co-chairman).

Nine dentists also received the EAO's prestigious Certificate in Implant-based Therapy. This followed their successful completion of an oral and written examination in Vienna – the final stage of the certification process. The newly certified candidates were: *Yusra Abdeslam* (Spain), *Ariadna Balcells* (Spain), *Marta Do Nascimento* (Spain), *Maria Giralt-Hernando* (Spain), *Toshihiro Hara* (Japan), *Gian Maria Ragucci* (Spain), *Pelayo Sicilia* (Spain), *Steve Siovas* (Scotland), and *Jingwen Yang* (China).

Spain was particularly well represented following a successful pilot project with postgraduate students from the International University of Cataluña in Barcelona.

The three chairmen of the Vienna meeting, *Ronald Jung*, *Michael Payer* and *Georg Mailath-Pokorny* received EAO silver medals in recognition of their work in organizing the congress. *Professor Björn Klinge*, past President of the EAO and long-time co-chair of the EAO's Consensus Conference, was awarded with a gold medal for exceptional service to the EAO. This was a special moment for the EAO, recognizing *Professor Klinge's* long and extensive contribution to the association.

During the meeting, the EAO also launched a new website showcasing "Key points for Clinical Practice from the EAO Consensus Conference" (www.eao.org/mpage/kpfcp). This features a concise summary of the findings of the 2018 EAO Consensus Conference, complemented by key points that clinicians can use in their day-to-day practice. The website also features a PDF download of the guidelines in nine languages: English, French, German, Italian, Japanese, Korean, Portuguese, Russian and Spanish. The guidelines will soon be available in Chinese as well.

The 2018 Congress broke new ground with three sessions focused on live surgery. On Thursday, the three surgical teams described the procedures they would carry out, with some of the patients joining them on stage in the auditorium. On Friday, delegates watched the live surgical sessions and saw each of the four cases that were treated. The two local surgical teams returned on Saturday to discuss the cases, again joined by their patients. The third team, based in Graz, participated by video link. This format brought implant dentistry out of the surgery and right into the auditorium, showing real cases taking place in real time. It was a unique opportunity for many delegates to see a wide range of clinical cases unfold first-hand. *EDI*

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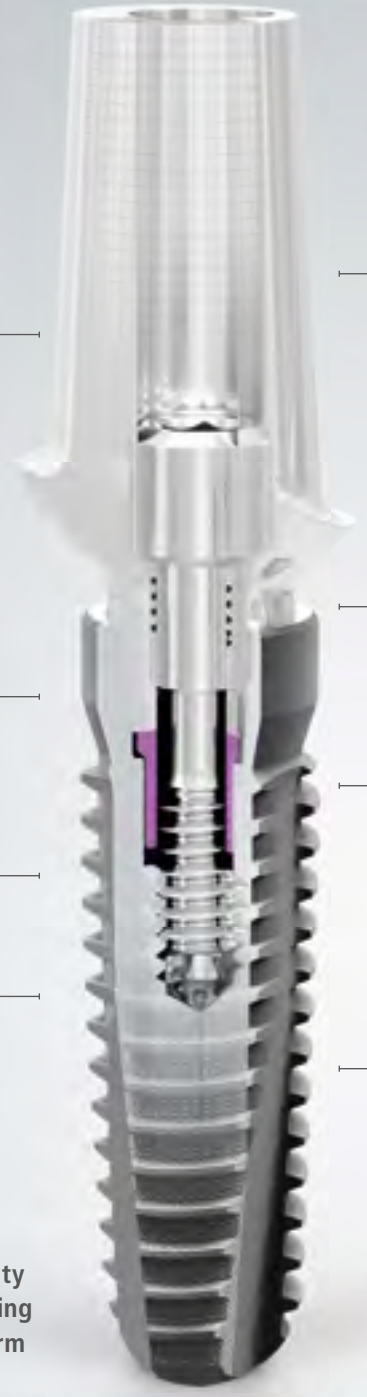

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WHO European health report 2018

Life expectancy continues to rise

WHO's flagship publication, the European health report 2018, welcomes an increase in life expectancy and reductions in premature mortality, but warns that smoking, alcohol, overweight and obesity and under-vaccination are hindering progress in some countries.

http://www.euro.who.int/en/data-and-evidence/european-health-report/european-health-report-2018

The World Health Organization's (WHO) flagship publication, the European health report, published recently, reveals that life expectancy in the WHO European Region continues to rise, and that some European countries enjoy the highest sense of "life satisfaction" recorded anywhere in the world. However, significant discrepancies between countries across numerous key indicators, and the failure to halt or substantially reverse the negative effects of tobacco smoking, alcohol consumption, overweight and obesity, and under-vaccination remain causes for real concern.

Progress uneven

"The latest European health report shows that most European countries have taken significant steps towards hitting key targets set by Health 2020, thus contributing to achieving the health-related Sustainable Development Goals of the 2030 Agenda," said *Dr Zsuzsanna Jakab*, WHO Regional Director for Europe. "Progress is uneven, though, both within and between countries, between sexes, and across generations. Lifestyle-related risk factors give cause for concern, as they may slow, or even reverse the great gains in life expectancy if left unchecked."

The European health report 2018 was launched just days ahead of the annual meeting of the WHO Regional Committee for Europe, that took place on 17 to 20 September in Rome, Italy, where its findings were discussed by delegates from the 53 Member States of the European Region as the basis for their policy-making.

Key findings

- In the European Region, people live on average more than one year longer when compared to five years ago. However, there is still over a decade of difference (11.5 years) between countries with the highest and lowest life expectancy.
- Europeans' sense of well-being is among the highest in the world, but variations from country to country are pronounced.
- Good progress has been made in reducing deaths from all causes (all ages) since the beginning of the millennium, with about a 25 per cent reduction in 15 years.
- Overall, Europe is surpassing the target of reducing premature deaths from the four major non-communicable diseases – cardiovascular diseases, cancer, diabetes mellitus, and chronic respiratory diseases – by 1.5 per cent annually until 2020.

Life expectancy in the WHO European Region continues to rise.

Photo: Fotolia/ Pavlo Vakhrushev

The latest data point to a 2 per cent decline per year on average. However, lifestyle factors affecting mortality from these causes remain a major concern, and may slow, or even reverse gains in life expectancy if left unchecked:

- Tobacco smoking rates are the highest in the world, with one in three people aged 15 and above smoking.
- While alcohol use is declining overall, adult consumption is still the highest in the world. Levels of consumption vary between countries, ranging from 1 to 15 litres per capita every year.
- Over half of the population is overweight and trends for both overweight and obesity in adults are on an upward curve across most of Europe, with considerable variations between countries.
- Child vaccination rates are improving in general across Europe, but recent outbreaks of measles and rubella in some countries are jeopardizing the ability of the Region to eliminate these diseases.
- Deaths from external causes of injury or poisoning have declined steadily by about 12 per cent over five years; yet such deaths were over three times higher among men than women.

Setting national targets and measuring progress

Published every three years, the European health report aims to track progress against targets set by the European policy framework, Health 2020, which aims to establish equitable, sustainable and universal health-care systems in Europe that give individuals control over the health decisions that most affect their lives.

The 2018 report acknowledges that a great deal has been achieved since Health 2020 was adopted in 2012. Most European countries are demonstrating real commitment to improving the health of their populations by setting targets, adopting strategies and measuring progress.

In 2016, 38 countries of the WHO European Region reported setting targets for health and well-being, or that they planned to do so in the near future, while 42 countries had put strategies in place to address inequalities, compared to just 29 countries in 2010.

While much remains to be done, this commitment, and the experience gained through the implementation of Health 2020, puts Member States of the WHO European Region in a strong position to move into the next decade better placed to realize the ambitious health-related Sustainable Development Goals.

Source: WHO European health report

Inherent systemic risk

At its plenary meeting in Brussels in mid-November, the European Dental Federation (CED) voiced sharp criticism of “dental chains” operated by financial investors. A resolution adopted by a large majority of CED delegates highlights the risks inherent in the increasing commercialization of dental services in Europe, which has already had serious negative effects in France, Spain and the UK.

The CED finds that patient protection is acutely at risk. There is always a confidential relationship between the dentist and the patient, says the CED in its resolution. Financial considerations should impact neither this relationship of trust nor any treatment decisions.

From the point of view of the CED, large dental chains also pose an inherent systemic risk to dental care: If a chain or corporation that provides part or all of the dental care in a region has to stop its activities, there is an acute risk of that region becoming undersupplied, a problem that has already surfaced in some EU member states.

For any dental chains already permitted to operate in individual EU member states, the CED recommends that they should be allowed to be managed only by dentists who actively work for them.

Source: CED

On the UK, health care and leaving the EU

Brexit – sword of Damocles

Doctors and nurses from the EU are feeling increasingly uncomfortable in the UK. No new staff members are taking up work. Like a sword of Damocles, Brexit is hanging over the island's health care system.

And no one knows what is going to happen. Discussions go back and forth, with still no agreement in sight. Those in the UK who have been longing for a hard Brexit to quickly turn the country into a new European tax paradise with minimal rules and regulations feel disappointed. But so do those who continue to hope for an amicable divorce and a Brexit deal that is acceptable to both the EU and the UK – despite all signs to the contrary.

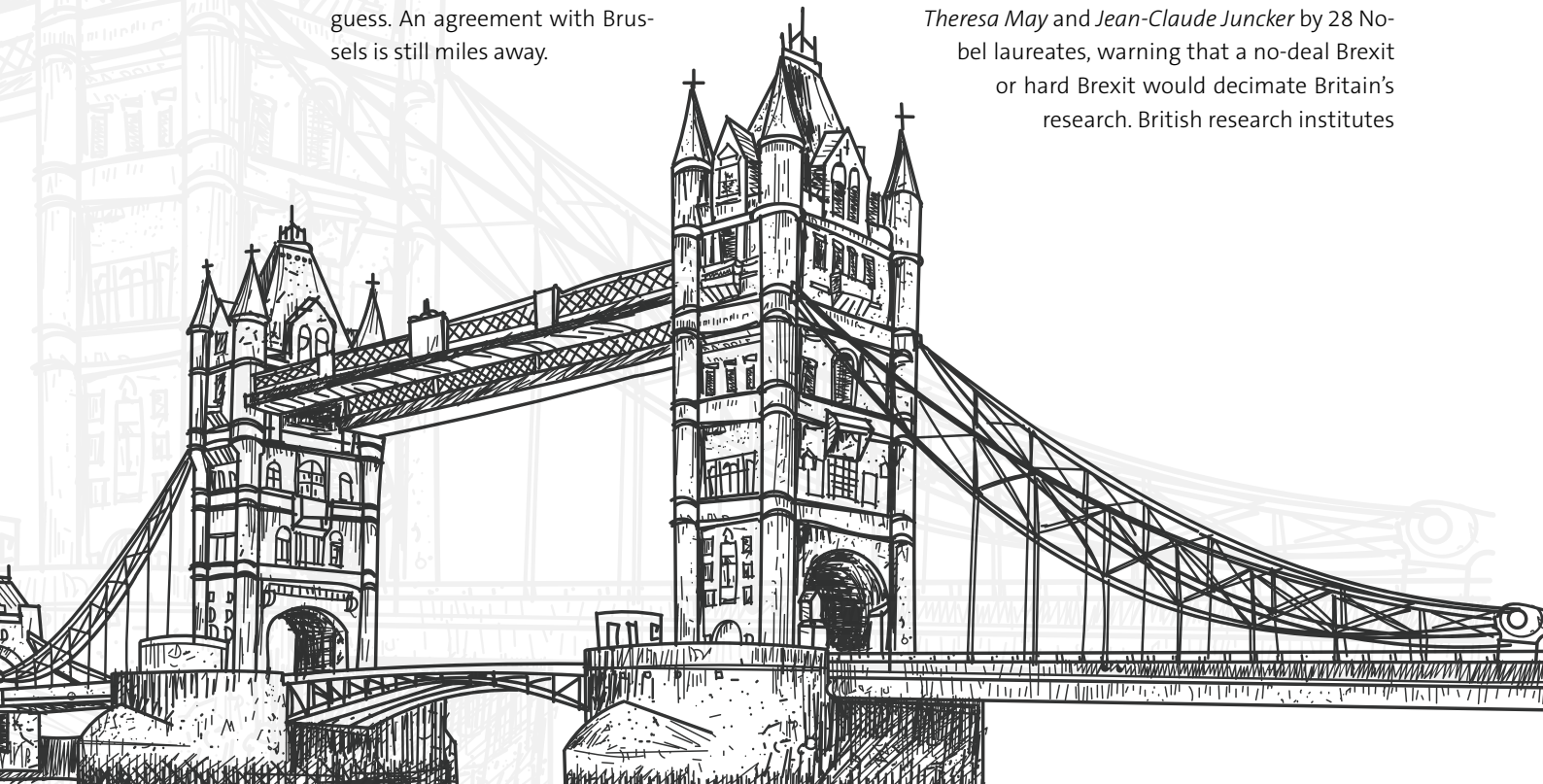
It is true that battered Prime Minister *Theresa May* once again managed to avert an impending coup by members of her own party – but that does not make Brexit negotiations any easier. The reason negotiations between Brussels and London have been deadlocked for months is not Theresa May herself. Rather, the problem is with red lines drawn on the UK side of the negotiation table – above all the Irish border issue and the British insistence that Northern Ireland should not be treated differently from England, Scotland and Wales in customs terms. How this is supposed to work once the UK leaves the EU at the end of March 2019 is anybody's guess. An agreement with Brussels is still miles away.

Bad for research, bad for science

The fact that the British currency has weakened considerably against the US dollar, the euro and other world currencies since the historic Brexit vote around two and a half years ago is not surprising. Equally unsurprising is the synopsis of a public statement by scientists from the respected Francis Crick Institute for Medical Research in London, where more than 1,000 researchers were asked for their opinion on Brexit. 97 per cent of them believed that the withdrawal from the EU will be "fundamentally bad for British research and science". Opened in 2015 for £ 700 million, the institute employs more than 1,000 staff, 40 per cent of whom hail from other EU countries; 43 per cent are from the UK, 17 per cent from non-EU countries.

The staff mix is similar at other large research institutions in the UK: without researchers and technicians from the EU, the Bunsen burners in many laboratories between London and Edinburgh would be on pilot light only.

Even more significant is a recent open letter to *Theresa May* and *Jean-Claude Juncker* by 28 Nobel laureates, warning that a no-deal Brexit or hard Brexit would decimate Britain's research. British research institutes



and universities are already complaining about how much more difficult the recruiting of EU researchers and other staff for a job on the island has become since the Brexit vote.

EU doctors throw in the towel

The situation is similar in the British National Health Service (NHS). Of the 221 public clinics recently surveyed by the Bureau of Investigative Journalism, 122 reported fewer EU doctors and nurses in their employment than a year ago.

This means there has been significant out-migration since the Brexit vote. Moreover, one out of two hospitals complaining about a loss of foreign staff also reports that EU doctors and nurses are giving up more often and more quickly than staff from non-EU countries.

Chaos at the borders

The UK Department of Health continues to spread optimism. They still claim to be confident that they will "get a good Brexit deal" that will benefit doctors and other NHS employees as well as patients. Meanwhile, the British National Audit Office warned a few weeks ago of impending chaos at the borders, should a "chaotic" Brexit on 29 March 2019 become reality. There has been talk of mile-long queues of lorries at the borders and chaos at seaports and airports, of staff shortages in customs and of fears that the government would have to rent entire fleets of ships to bring in urgently needed medicines after Brexit. The daily newspaper The Guardian recently wrote that it was a shame they even had to report on such a state of affairs in the United Kingdom in the year 2018.

Arndt Striegler

Academy of Osseointegration

Growing European influence

The Academy of Osseointegration (AO) emerged in 1982 from a study club of dentists from the New York City area who had dedicated themselves to osseointegration and initially wanted to promote continuing education in this field within the framework of a national organization. In subsequent years, a significant European influence made itself felt. BDIZ EDI Board member Dr Jörg Neugebauer has been a member of AO since 1995. On 23 January 2019, the first Charter Chapter meeting of the Academy of Osseointegration in Germany will be held at the University of Heidelberg.

Dr Jörg Neugebauer

Dr Neugebauer, you are the first, and so far the only, German member of the AO board. What significance does the Academy of Osseointegration have for you?

The AO is the world's leading scientific implantological association. It will hold its 34th annual meeting in Washington, DC in March 2019; this meeting is a traditional place for implant dentists to come together. This is where I meet other implantologists from all continents to exchange notes and views. The lectures, workshops and industry forums offer an overview of current developments. I have attended this event every year since 1995.

How is the AO conference different from European meetings?

In line with dentists in the USA often being more highly specialized – as surgeons, periodontists or prosthodontists – there are different forums for each treatment focus. Researchers are not neglected either: Special lecture blocks are offered for clinical and basic research or poster presentations. This provides an opportunity to rub elbows with the big names in oral implantology – but you can also familiarize yourself with the results and ideas of lesser-known implantologists and researchers.

Americans are known for their very strong commercial orientation. How is this reflected in their contact with manufacturers?

The scientific lectures painstakingly attempt not to promote any specific manufacturer. But you can always learn more about the products offered by exhibitors at the accompanying tradeshow, which features many manufacturers, not just American ones. The breaks and receptions are designed to serve a professional exchange of ideas, as the coffee breaks and lunches are offered in the same hall as the exhibition. This is where you meet people you have met before, where you can refresh old acquaintances and share experiences. In addition to the approximately 70 speakers on the main podiums, around 300 posters and 60 short scientific presentations will be presented over the four-day event.

What goals does the AO pursue with its activities on a national level, the so-called Charter Chapter meetings?

With its almost 6,000 members from 70 countries, the AO is the leading international association in the field of oral implantology. But since not all national members can or wish to travel to the USA every year, we want to keep the spirit alive for local members. Similar initiatives were very positively received in, for example, Spain, South Africa, France, India and Japan. So we would like to expand this network in Germany as well. Only through open and honest sharing of experience, by looking across the fence, can we develop oral implantology further. In doing so, we are following the mission of the AO to improve oral health by promoting the science, ethics and practice of oral implantology and related technologies, and by supporting the professional needs of its members worldwide.

Thank you very much for your interesting comments.

The interview was conducted by the editorial team of EDI Journal.

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14th Expert Symposium of BDIZ EDI

For the 14th time, the BDIZ EDI invites to its Expert Symposium in Cologne. The topic "Complications during implantological treatment: avoid – treat – improve results" addresses surgical and prosthetic aspects. Those interested should remember the date: Sunday, 3 March 2019 – as always in Cologne at the Dorint Hotel on Heumarkt. The one-day CPD event is traditionally held on Carnival Sunday.

Training during daytime and carnival in the evening. With the 14th Expert Symposium, the BDIZ EDI takes a look at possible complications, which mainly occur in unfavourable anatomical conditions and/or in case of reduced bone supply. In these cases, the damaging of adjacent anatomical structures may be involved. An appropriate prosthetic restoration requires adequate preoperative planning under functional aspects. Biological and mechanical limits must be considered. The goal of the 14th Expert Symposium is to identify strategies for avoiding complications in implantology treatment and, if they have already occurred, how to treat them and improve the result. The day before, the 14th European Consensus Conference (EuCC) will prepare a practical guideline on the subject, which will be made available to members free of charge in English and German.

The BDIZ EDI Guidelines published so far date back to the year 2006 and have already been partially revised. Here is a list of the current consensus papers:

2018: Patient-oriented treatment concepts in oral implantology
2017: Digital workflow in implant dentistry
2016: Update on short, angulated and diameter-reduced implants
2015: Peri-implant inflammation: prevention – diagnosis – therapy
2014: Avoiding implant malpositioning
2013: Cologne classification of alveolar ridge defects (CCARD)
2012: Cologne ABC risk score for implant treatment

All BDIZ EDI Guidelines published so far are also available in digital form – both in German and in English at www.bdizedi.org > Zahnärzte > Praxisleitfaden or by clicking on "English" under Professionals > European Consensus Conference.

AWU

Preliminary programme, 14th Expert Symposium

Complications during implantological treatment: avoid – treat – improve results

Possibilities and limits of covering recessions on implants
Professor Anton Sculean MS, Bern, Switzerland

Complications with all-on-four restorations and their management
Professor Robert Haas, Vienna, Austria

Laboratory solutions for restoring incorrectly placed implants
MDT Gerhard Stachulla, Bergen, Germany

Biological and technical complications in implant prosthetics: prevalence, aetiology and prevention
Dr Peter Gehrke, Ludwigshafen, Germany

Complications with tooth/implant connections
Professor Hans-Joachim Nickenig, Cologne, Germany

Diagnosis and therapy following nerve damage
Professor Joachim Zöller, Cologne

Oral reconstruction in cases of imminent and actual implant loss
Dr Jörg Neugebauer, Landsberg, Germany

Details and registration

14th BDIZ EDI Expert Symposium
Dorint Hotel on Heumarkt, Cologne, Germany
Sunday, 3 March 2019

For programme and registration form, please go to www.bdizedi.org > English > News

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without Periodontology is
like Yin without Yang.

No Implant**O**logy without Period**U**ntology

No Implantology without Periodontology.
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Pros and Cons

Does the digital workflow work out?

This issue focuses on the topic of digitization. Two experts comment on the question of how the digital workflow works out in the dental practice. Both interview partners make precise distinctions and both make it clear that it is no longer a question of "digitization: yes or no", but rather of "how and where". While Adj. Professor Jan-Frederik Güth lists five criteria as to when and why new technologies will prevail, Professor Bernd Wöstmann raises the question of the interface problem. The interviews were conducted by Editor-in-Chief Anita Wuttke.

Where is the digital road in the dental office going to take us?

Adj. Professor Jan-Frederik Güth
"The real advantage of the digital transformation is that it generates a lot of valuable information that we can use to optimize treatment processes and treatment quality. In other words: We can make earlier and more informed treatment decisions based on digital diagnostics. Take 3D implant planning. We already have isolated technologies such as intraoral scanners, digital axiography, virtual articulators, and 3D facial scans, which are constantly getting better, more efficient and more user-friendly. But we will reap the true benefits once all these technologies are linked, further enhancing information and efficiency gains in the future. Nevertheless, the use of digital technologies will not replace our professional knowledge and skills."

Professor Bernd Wöstmann
"Dentistry will definitely go digital – no two ways about that. The question is how that will happen. Digital procedures in the dental laboratory are already everywhere, much more so than in the dental practice. By comparison, ten or 15 years ago, dental laboratories stood where dental practices stand today. The digital transformation is a trend that affects everything. Just look at what you get if you enter 'CAD/CAM' and 'digital workflow' in Google. You will get a lot of dentistry-related hits. And consider what is happening in the field of impression-taking, dental restorations, orthodontic planning (aligners) – there are many solutions under development or even already available. Let alone X-rays, where there are nearly no analogue 'pockets' left today."

What are the advantages/disadvantages of a digital workflow?

Adj. Professor Jan-Frederik Güth
"One of the strengths of working digitally is the high degree of reproducibility – not just from a clinical aspect. As soon as we enter the digital world of 0's and 1's, there is very limited scope for interpretation. It will be primarily a matter of developing and coordinating interfaces in order to make the data transfer smooth and loss-free. Scientists are currently working on how we can enter the digital world – acquiring digital data, with intraoral scanners for example – and then returning the data to the real world in the form of geometrical designs, such as for dental restorations. Thus, in addition to software development and subtractive machining technology, additive manufacturing (3D printing) is currently developing extremely dynamically and has immense potential. However, as always, scientific evidence will have to be obtained first."

Professor Bernd Wöstmann
"The problem that we have in dental treatment is that it invariably involves some form of manual activity. There is always a certain amount of scatter, a certain bandwidth involved in treatment activities due to the large number of different tasks that make up a given treatment. And whenever you make allowance for scatter or bandwidth, you will inevitably get inaccuracies: restorations that do not fit all that well, implants that are subjected to stress, 'aligners' that do not fit properly, brackets that are not bonded properly. Even minimal standardization will improve quality, initially with no out-of-pocket expenses. So from a scientific point of view, everything speaks for standardization. Do not get me wrong: This does not mean that the same procedure must be followed in all dental offices. All dentists will have to find their own standardized way in their own environment; and digitization helps with that."

One topic that has received much popular attention has been that of robots placing implants. What do you make of that?

Adj. Professor Jan-Frederik Güth
"Aaah, the 'Implant Terminator' … but it is probably not quite imminent. It is difficult to say whether, and when, this kind of technology will appear on the clinical scene, because not everything that is technically feasible makes clinical sense and would be accepted by our patients. However, digital systems already support the operator in many surgical fields.

Painting everything in black and white is not going to help. At the end of the day, the dentist is responsible for making medical decisions, not the machine."

Professor Bernd Wöstmann
"Maybe at some point this will work; at the moment I do not think that our technology is advanced enough for that. With all the positive aspects of standardization and digitization, you have to be careful not to exaggerate. An old joke nicely illustrates that: 'Have you heard about the automatic shaving machine at the train station?' – 'Is that even possible? Are all heads the same?' – 'Well, they are now …' In other words, getting back to your question: The costs and benefits are not yet in proportion. A problem that we have right now is that the many wonderful building blocks that already exist cannot easily be linked, they are not integrated."

Conclusion

Adj. Professor Jan-Frederik Güth
"For me, the question of digital dentistry is no longer 'yes or no', but 'where'? 'Where' as in: Where we can use this technology for the benefit of our patients? Potential indications are becoming more extensive, and advantages are getting to be more clearly discernible. A new technology will prevail if one of the following criteria is met:
1. It offers the same quality at a lower price.
2. It offers better quality at the same price.
3. It is associated with simpler/more convenient/more user-friendly procedures.
4. No one can master the old technologies anymore.
5. The new technology offers solutions that cannot be implemented with existing technologies (killer applications)."

Professor Bernd Wöstmann
"With everything that is positive and desirable about the digital workflow, there is one thing that is sadly missing: well-defined interactions between the individual procedures and components. To merge the data, we need interfaces between the systems, and those are missing. A lot is already possible, but for something to be practicable, it has to be fast and absolutely simple! For example, during implant planning, CBCT data sets can be superimposed with the data from intraoral scans. But you still have to work with several programs, and you have to know exactly what you are doing. We do not have a practical workflow yet that is easy to handle. The Cerec software is a good example of how things should be: The user is literally taken by the hand all the way, from scanning to planning to milling. Workflows like that are what we would like to see. Alas, many manufacturers still do not seem to be very interested in how compatible their devices are. That will have to change. In addition, most intraoral scanners are still too expensive to be used just for scanning, when they can do so much more. Why not scan the patient's entire mouth and save the data for later use? If the patient ever needs a crown, you will have the original tooth data to refer to!"

Adj. Professor Jan-Frederik Güth

Polyclinic for Dental Prosthetics
Ludwig-Maximilians-University Munich
Goethestraße 70, 81667 München, Germany
jan_frederik.gueth@med.uni-muenchen.de

Adj. Professor Güth is an executive dental consultant and deputy clinic director of the LMU Munich, Department of Restorative Dentistry. He completed his postdoctoral (habilitation) thesis in the field of digital dentistry and has extensively studied the opportunities as well as the limitations of innovative procedures and technologies in dental prosthetics.

Professor Bernd Wöstmann

Polyclinic for Dental Prosthetics
University Hospital Gießen
Schlangenzahl 14, 35392 Gießen, Germany
bernd.woestmann@dentist.med.uni-giessen.de

Professor Bernd Wöstmann is director of Dental Prosthetics at the University Hospital Gießen. He is a member of the advisory board of DGPro and of various editorial boards.

Foto: pixabay.com/fjaka

Interview with Professor Pavel Kobler on the situation of dentistry in his country

Pioneer of oral implantology in Croatia

At that time the issue was the Cologne Classification of Alveolar Ridge Defects (CCARD) in bone augmentation: Professor Pavel Kobler from Zagreb (Croatia) has been a regular participant in the annual European Consensus Conferences (EuCC), held under the auspices of the BDIZ EDI since 2013. He also took part in the most recent expert panel discussion in 2018. He became the first implantology specialist (EDA) from Croatia after having passed the requisite examination and was co-responsible for the respective programmes of the European Symposiums in Split in 2013 and in Dubrovnik in 2017. Professor Kobler is a pioneer of oral implantology in Croatia. Editor-in-Chief Anita Wuttke spoke with him about local developments in dentistry. Croatia has traditionally maintained close contact with Germany and has been a member of the EU since 2013.

Professor Kobler, how would you describe the situation of implant dentists in Croatia?

Dentists in Croatia are very much interested in oral implantology. As a trailblazer and one of the first implantologists in our country, I am not satisfied with the way some colleagues implement implantological treatments. Many of them have not had the requisite appropriate training. They promise too much in their advertising, they lack the art of self-criticism – and as a result, many patients end up disappointed.

How big is patient demand for implants?

Our patients are very interested in implants, and there are more and more of them. The internet has given us access to information in all fields, and dental implantology is no exception. Unfortunately, there are still many edentulous patients in this country, even very young ones – patients who no longer have any usable abutment teeth. Here, implant treatment will often be the only good solution. There are patients who seek out this mode of treatment themselves, visit a few dentists and often end up with well-intentioned but inadequate treatment. On the other hand, many of our patients perform inadequate oral hygiene habits and do not visit their dentist regularly.

What types of continuing professional development are offered?

I was the one to introduce dental implantology in undergraduate teaching. However, this only consists

The European Consensus Conference (EuCC) 2018 in Cologne, with Croatian participation. Topic were patient-oriented treatment concepts.

Professor Pavel Kobler (left) at the 11th European Symposium in Dubrovnik in 2017, with Dr Peter Engel, president of the German Dental Association, Christian Berger, BDIZ EDI president, and Dr Hrovje Pezo, president of the Croatian Dental Chamber.

of theoretical instruction and is no sufficient basis for clinical implantological work. In Croatia, as in the rest of the EU, many implantology courses are arranged by manufacturers, often in the form of workshops. As an oral surgeon and professor, I do not think this is enough. For several years, we have had postgraduate courses in dental implantology at dental schools; courses and meetings are organized by dental schools and by the Croatian Dental Chamber, usually with renowned international lecturers. But attending those courses does not confer specialization or the acquisition of surgical skills or enable the dentist to perform clinical work on patients.

As a university professor, what are your plans for continuing education?

While dentists definitely consider oral implantology a professional challenge, material gain is unfortunately too often a main consideration. Dentists forget that implant treatment is a difficult task, to be approached responsibly; it is frequently associated with complications during and after the operation and also with later complications such as peri-implantitis. I hope that the day will come, with the help of BDIZ EDI, when a certificate will be needed to practice oral implantology. That means including dental practitioners in training events organized by BDIZ EDI, too. I am aware that this will not be easy, but I am still optimistic.

What is the position of oral implantology in terms of its acceptance by politicians and the Ministry of Health?

Croatia is a country with a low GDP, so the funds available for health insurance are limited. As in all European countries, patients' rights depend on political decisions. Every year, the Croatian Health Insurance Fund pays out less money for procedures in dental medicine. The cost of oral implantology procedures are not covered and have to be shouldered by the patients themselves. Other, private, insurance options (Croatian and European) are slowly entering the market.

What are your expectations of the European health care market?

Free movement of people and of goods are among the fundamental European freedoms, so citizens can benefit from this in dental health care. All dental procedures are more expensive in West European countries than in Croatia. Many travel agencies are offering packaged fields including dental treatment – "dental tourism". It is legal, it cannot be prohibited, it is a result of our free-market principles. We will see the results more clearly in the future.

Thank you very much, Professor Kobler, for your interesting comments. *AWU*

Female dentists in Europe

Dentistry is my passion

In the second part of our series, we introduce Dr Inês Guerra Pereira from Porto (Portugal). She has long been associated with the BDIZ EDI and organized the European Symposium in Lisbon in 2011. At the 14th BDIZ EDI Annual Symposium 2010 in Munich, she delivered a presentation on behalf of Professor Antonio Felino of the University of Porto about the importance of bone-preserving surgical techniques for subsequent implantation procedures.

Name:	**Dr Inês Guerra Pereira**
Profession:	**Dentist, oral surgeon, paediatric dentist**
Office:	**Porto, Portugal**
Age:	**34 years**
Family:	**Married, no children, one dog**
Active:	**Member of BDIZ EDI**

Why did you decide to become a dentist?

My mother is a hairdresser and owns several hairdressing salons. I have always lived in the world of aesthetics, fashion and beauty, and as I grew up I attended the world congresses of L'Oréal, where people always held a smile that was like a business card. As a consequence, the path my professional development would take was obvious to me – being able to create smiles and helping people to feel good. Contributing to better oral health is the main privilege our profession affords.

How did you become a dentist?

I attended dental school at the Faculty of Health Sciences of Fernando Pessoa University in 2002, graduating in 2008. At that time, dentistry was a six-year degree.

How did your professional career get started?

The beginnings of my professional activities were rather peculiar, I think. Even before finishing dental school, I had visited *Professor António Felino's* clinic to present a project concerning networking in dental medicine. This was the year that Lehman Brothers went bankrupt, and finding employment was as urgent as it was difficult. My idea was to bring established dentists and recent graduates closer together to create opportunities within the job market. On the day of my presentation, I started working with *Professor Felino*, a remarkable figure on the national dental stage. A year later, I was invited to join the oral-surgery group of the Faculty of Dental Medicine of the University of Porto – and teaching became another passion of mine. In 2015, I defended my doctoral thesis about genetic susceptibility to odontogenic maxillary sinus pathology.

What are your specialities?

In 2017, I was awarded the title of Specialist in Oral Surgery by the Portuguese Dental Association. I have since practiced oral surgery within paediatric dentistry, as there are a number of surgical interventions commonly needed in children, with unerupted and impacted teeth, congenitally missing or supernumerary teeth, structural abnormalities and pathologies particular to newborns and infants. This led me to pursue a postgraduate degree in paediatric dentistry and a second one in interceptive orthodontics.

What are your hobbies?

My current – exciting! – hobby is also related to dentistry. I took several courses in digital marketing, which alerted me to this new and challenging world. This is how my personal blog was born (www.denteadente.pt). It is amazing to see how these new technologies allow us to communicate, raise awareness and educate patients in oral health in close proximity to the general population. Communication has always been a passion for me, and social networks allow me to develop new ways to communicate. That is also why I helped organize several scientific events in the field of dentistry, being responsible for advertising, marketing and communication.

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[1] Data on file at RTI Surgical, Inc.

Photo: Koelnmesse IDS

Outlook for IDS 2019 in the digital sector

Implant placement by robot?

3D printing is widely regarded as a potential "game changer" – with new treatment methods, new forms of teamwork, new business models. And dentistry is one of its pioneering fields. According to a recent analysis, the global market for industrial 3D printing products is expected to grow by an average 13 to 23 per cent per year, reaching a volume of € 22.6 billion by 2030, as Koelnmesse/VDDI forecasts ahead of IDS 2019.

In medical technology in particular, the market will grow from € 260 million (2015) to € 5.59 billion (2030). Experts expect this development to take place in two phases: By around 2020, the main focus will be on "reinventing" existing products, followed by an increase in the use of innovative materials and optimized printing processes. When comparing different industries, 3D printing is growing fastest in medicine and dentistry. This indicates that dentists, dental technicians, and the dental industry as a whole are natural trailblazers.

The printing of frameworks using laser-assisted processes, for example, has long since been established, while dental models, for example, are made from resin. Market researchers see the greatest opportunities in the realms of orthodontic appliances, prostheses, crowns, bridges, aligners, and models. A wide range of these are already commonly found in laboratories and practices.

Spectacular applications

This manufacturing technology keeps generating new surprises as we see more and more reports of spectacular uses. Advanced applications include a 3D-printed custom holder for dental floss for use in professional tooth cleaning. Lifelike images prove their worth in patient communication. A smile that was digitally modelled in consultations with the patient can be a template for a printed 3D model; this model in turn is used to generate a "negative" of the patient's dentition in the form of a silicone

Preview IDS 2019

IDS, the International Dental Show, will be held in Cologne from 12 to 16 March 2019. The full range of procedures and applications will be represented, including 3D-printed models of all kinds, gingival masks, surgical stents/drilling templates, cast designs, (custom) impression trays, splints (including orthodontic repositioning splints), transfer indices, aligner foils and resin long-term provisionals, as well as printed crown and bridge frameworks, bars and dentures bases made of metal alloys. At the exhibition stands, suppliers will explain the properties and uses of printable materials, software solutions and services tailored to office and laboratory needs.

index to ultimately derive thin "simulated veneer" replicas of the final restoration for a first intraoral aesthetic examination.

A robot has succeeded in inserting two 3D-printed teeth into a live patient's jaw. And in order to restore the original shape of the jaw after an oral tumour was removed, the defect can now be scanned and a stent produced using 3D printing. The stent is then used to harvest a perfectly fitting bone block from a different site (for example, from the fibula) to be inserted into the mouth as a perfectly matching substitute – which for the patient means an approximately eight-hour course of "all-in-one" surgery.

To speak of 3D printing as a monolithic technology seems to be an understatement today, because so many different processes have been developed. These include stereolithography, which is suitable for surgical stents produced to an accuracy in the lower two-digit micrometre range – to give one example – and which can be used with a wide range of acrylic resins in dentistry. Then there is the DLP (digital light processing) procedure, known for its high speed, because a single wide exposure to the light source (rather than a dancing laser beam) cures each layer of the object in a flash. The polyjet process achieves extremely high accuracy (16 micrometres). It probably most resembles the well-known office printer in functionality and requires no supporting structures or post-processing of the material.

From plastic to metal printing: There is selective laser melting (SLM), selective laser sintering (SLS) and direct metal laser sintering (DMLS), or lasercusing, all used for crowns, bridges and denture bases (digital cast-metal bases) made of non-precious dental alloys or titanium.

Source: Koelnmesse/VDDI

Academy – Oral Health – International (AMI) aid project

Africa in focus

A new association was founded in Munich in October: Academy – Oral Health – International (AMI, after the German initials), a section of the Academy of Dentistry International (ADI). AMI aims to pool knowledge to promote oral health worldwide and improve the quality of life of people without access to adequate dental care.

This is not about another aid project that collects donations. The aim is to bring together the professional groups and players involved in dental care: dentists, dental students, dental nurses, dental assistants, as well as organizations and companies in the health care sector, which join forces to form a special-interest group. Specifically, the focus is on foreign aid missions, on-site training of dental assistants and support for dental training in the target countries with the help of various groups of specialist dental professionals. AMI will also provide training for local health educators. Initially, the association will support local projects in Africa (Mozambique, Uganda and Ethiopia).

Dr Dietmar Klement (Würzburg, Germany), AMI chair, pointed out at the inaugural meeting that project support presupposed and mandated the integration of local structures. A first coordinating conference is planned to be held at IDS Cologne in 2019.

Leaders of the newly founded Academy – Oral Health – International (AMI) (from left): Friedrich Herbst, Dr Dietmar Klement (Chair) and Dr Wolfgang Neumann.

The new Management Board: Chair, *Dr Dietmar Klement* (Würzburg); Vice Chair, *Henry Engelhardt* (Würzburg); Advisory Board members, *Dr Wolfgang Neumann* (Philippsthal) and *Friedrich Herbst* (Bensheim).

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Did you ever know ...

... that the 2018 Guideline

of the European Consensus Conference (EuCC) held under the auspices of the BDIZ EDI is now available for download in both English and German? (Incidentally, all previous Guidelines since 2006 are available online.)
www.bdizedi.org > English > Professionals > European Consensus Conference

... that the BDIZ EDI

is introducing female dentists throughout Europe in a loose succession of interviews in its EDI Journal? The new format documents their lives and careers and shows how they assert themselves at work and in their private lives. The pilot interview can be also read online:

www.bdizedi.org > English > BDIZ EDI > Europe

... that the EDI Journal

is sent out to all members of the partner associations of the BDIZ EDI? The only requirement is membership of the respective association in the BDIZ EDI. The partner associations and their work are regularly presented in our journal. Back issues (PDF files) of the EDI Journal are also available online:

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Europe Ticker +++

Dubious digital training centre based in Malta

Bachelor of Medicine?

At the end of June, the newly registered Digital Education Holdings Ltd. (DEH), based in Malta, disclosed that it was planning to set up an online course of study that will lead to a Bachelor of Medicine degree after three years. A student quota of 75 has been earmarked for Germany, with the Helios clinics as cooperation partners. So just study for three years and you are a finished (bachelor) doctor? Without ever having seen the inside of a lecture hall?

According to its PR statement, the DEH's EDU academic platform in Malta is the first digital training centre of its kind in the world. EDU claims to combine modern digital didactics with intensive practical training at a teaching hospital. "The medical programme consists of a three-year bachelor's and a consecutive two-year master's in medicine – with a total of more than 5,500 hours of theoretical instruction and hands-on clinical training. The resulting degree will be certified with a minimum of 300 ECTS, equivalent to EU standards for medical training", as the initiators state. (ECTS stands for European Credit Transfer and Accumulation System, a standardized metric for academic achievements.)

That same day, *Evarist Bartolo*, the Maltese Minister of Education, accredited DEH as a college (not as a university). The National Commission for Further and Higher Education is in the process of accrediting the DEH Bachelor of Medicine within the European Qualifications Framework.

DEH describes itself as a "young company based in Kalkara, Malta, with offices in Berlin, Bratislava and Prague". According to the company, the team consists of the founders and managerial staff. In their own words: "With a rich partner ecosystem, we are building degree programmes that rely on European traditions, equipping our graduates with twenty-first century skills and instilling in them a strong sense of responsibility."

Source: Various media

Photo: Fotolia/adresiastock

Czech Republic:
Financial incentives to fight dentist shortage

Grants for dental practices

In its fight against the dearth of dentists in rural and peripheral regions, Czechia is providing financial incentives for the first time, as the Czech radio serving an international audience, Radio Prague, reports. As a result, the first subsidies were paid out to three dental practices in Cheb and Ústí nad Labem in the north and Horní Cerekev in the south. In the three cases mentioned, subsidies in the amount of € 140,000 were paid out to help cover the salaries of general nurses and dental hygienists or for dental instruments. Funding is subject to conditions: Applicants must prove that children and pensioners make up at least ten per cent of their registered patients. "It is very difficult to find dentists willing to treat children. With the exception of Prague, there is a shortage of dental care personnel for children in practically all regions of the Czech Republic", said Minister *Adam Vojtěch*. In addition, the practices must be open at least 35 hours a week and have contracts with at least four statutory health insurers. According to the Ministry of Health in Prague, the maximum grant is the equivalent of € 9,350 for twelve months.

Applicants must contribute at least 30 per cent of the total budget. The authority has earmarked almost € 4 million for this measure. Until 2021, grants may be awarded to up to 100 applicants. The recipients of the funding are selected by the ministry in cooperation with the Czech Dental Chamber, Česká stomatologická komora.

Source: Radio Prague

Changes to EHIC procedures in effect since October

Re: EU patients

Minor changes to the European Health Insurance Card (EHIC) took effect at the beginning of October. Patients insured in other EU or EEA countries or in Switzerland must present their European Health Insurance Cards for treatment in Germany. An exception was granted for data recorded in mobile emergency services, which may still be recorded manually in future. ››

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Europe Ticker +++

In the form "Patient's Declaration, European Health Insurance" a new line has been inserted for recording the name of the attending physician or dentist.

There is now a separate form for health insurance providers to facilitate uniform documentation of the so-called "national proof of entitlement".

Source: Various German statutory health insurers

EU Commission on chemicals

A closer look at hormones

The EU Commission wants to take a closer look at the effects of hormone-damaging chemicals in Europe. In the coming weeks and months, EU legislation will be examined for persisting loopholes, the Brussels authority announced; a public survey is being planned as well.

Hormonally active substances, endocrine disruptors, can be found in plastics and body care products. They have been associated with hormone-related cancer and reproductive and fertility disorders. This is why they are currently regulated in a variety of areas, such as food safety and environmental requirements. European environmental and consumer protection groups had recently called for a more comprehensive EU strategy. A spokeswoman for the EU Commission said that a "fitness check" of the existing rules was necessary before new legislative initiatives could be launched. The Greens in the European Parliament demand stricter testing procedures, since hormonally active substances can harm people even in very small doses.

Source: Ärzte-Zeitung, Germany

Photo: Fotolia/bits and Splits

Photo: Fotolia/Stockfotos-MG

Swiss patients abroad

Low-price offerings attract insurance customers

Swiss health insurance funds have traditionally not reimbursed patients for the cost of medical treatment abroad. But for some time now, insurers have been competing for new customers with cheap offers – including coverage for dental treatment. For example, the Assura health insurer in Geneva has repeatedly promoted treatment outside Switzerland. The Swiss Dental Association (SSO) has condemned this practice, citing it was legally questionable, a potential patient hazard, and wrong from a health policy point of view. More and more health insurance companies are sending Swiss patients abroad for medical treatment, deliberately courting customers with savings offers in cooperation with specialized providers. In principle, the so-called territoriality principle prevails in Switzerland. This means that basic insurance only covers benefits provided in Switzerland. However, in times of rising insurance premiums, this principle has come under attack. The Swiss parliament is openly discussing its abolition. Even the Swiss Federal Council's expert report on reducing the cost of health care calls for medical treatment outside Switzerland to be paid for if it is cheaper there than at home. The SSO deplores "inconsistent behaviour on the part of health insurers and authorities". In Switzerland, the health authorities enforce strict hygiene rules, back-to-back supervision and stringent regulations – in the interest of patient safety. However, foreign standards and their compliance cannot be monitored by Swiss authorities.

Source: SSO

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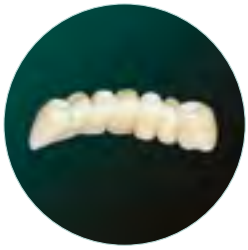

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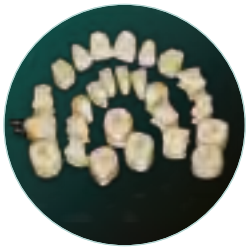

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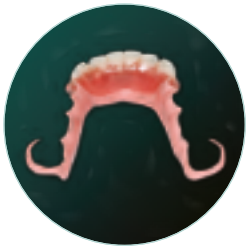

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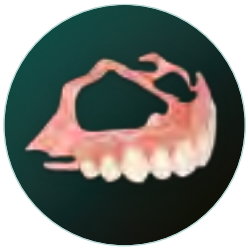

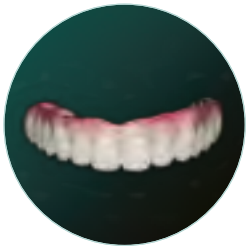

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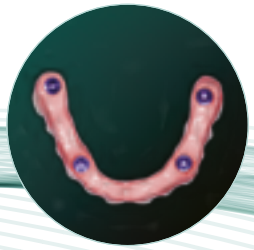

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Suspension of paid annual leave entitlement during parental leave not in violation of European law

ECJ: Special status of parental leave

The European Court of Justice (ECJ) ruled on 4 October 2018 (Case C-12/17) that a national regulation which provides that periods during which the employee is on parental leave are not to be taken into account when determining the paid annual leave entitlement does not violate European law (Article 7 of Directive 2003/88/EC of the European Parliament and of the Council of 3 November 2003 concerning certain aspects of the organization of working time).

The case

The plaintiff, *Maria Dicu*, is a judge at the Regional Court at Botoșani, Romania. After taking maternity leave from October 2014 to February 2015 and subsequently parental leave from February to mid-September 2015, she was granted the requested 30 days of paid annual leave until mid-October. When the plaintiff requested a further five days' paid annual leave at the end of the year, it was not granted.

Her employer, the Regional Court at Botoșani, refused that request on the grounds that the period of parental leave she took in 2015 could not be regarded as a period of actual work. Therefore, no paid annual leave entitlement would accrue during this period. The paid annual leave granted, her employer said, had already included seven working days from her 2016 contingent.

According to Romanian law (Articles 49 and 51 of the Labour Code), an employment contract may be suspended at the employee's initiative if parental leave is taken to care for a child under the age of two. While the contract is suspended, the employee is not obliged to perform actual work. The employer does not owe any remuneration during this period.

The Romanian Labour Code also provides (Article 145) that periods of temporary incapacity for work and periods of maternity leave, risk leave during pregnancy and lactation and leave to take care of a sick child are to be considered periods of actual work for the purposes of determining the amount of paid annual leave. These absences therefore have no negative effect on the employee's paid annual leave entitlement. The same applies if an employee cannot perform anny actual work due to illness.

The plaintiff brought proceedings against that negative decision, seeking a declaration that the period she took as parental leave is to be regarded as a period of actual work for the purpose of determining her paid annual leave entitlement for 2015. The Regional Court Cluj granted the plaintiff's application. The defendants, the Regional Court at Botoșani and the Ministry of Justice, appealed that decision.

The Court of Appeal stayed the proceedings and referred the following question to the ECJ for a preliminary ruling:

"Does Article 7 of Directive 2003/88/EC preclude a provision of national law that does not consider a period of parental leave to care for a child under the age of two to be a period of actual work for the purpose of determining the duration of an employee's paid annual leave?"

The ECJ judgment

The ECJ concluded that Article 7 of Directive 2003/88/EC does not preclude a provision within national law which provides that the amount of time spent on parental leave are not taken into account when calculating entitlement to paid annual leave.

Article 7 (1) of Directive 2003/88/EC provides that every employee is entitled to paid annual leave of at least four weeks; conditions for the entitlement to and granting of that leave are laid down by national legislation. Article 17 of Directive 2003/88/EC provides that member states must not derogate from this provision, that is, no provision that works to the detriment of the employee is permissible (paragraph 24).

The ECJ first emphasized that the entitlement to paid minimum leave must be regarded as a particularly important principle of social law in the European Union (ECJ judgment of 20 June 2016, *Maschek*, C-341/15, paragraph 25 and elsewhere), which is expressly set out in Article 31 (2) of the Charter of Fundamental Rights of the European Union, (ECJ judgment of 29 November 2017, *King,* C-214/16. paragraph 33 and elsewhere). While it is for the member states to determine the conditions for the exercise and implementation of the right to paid annual leave, the very existence of the right to paid annual leave must not be made subject to any preconditions whatsoever (ECJ judgment of 20 January 2009, *Schultz-Hoff,* C-350/06, paragraph 46 and elsewhere). However, the question submitted does not concern the conditions of origin, but the question of whether parental leave is equivalent to a period of actual work (paragraphs 25, 26).

The purpose of Article 7 (1) of Directive 2003/88/EC is to enable the employee to rest from the obligation under the employment contract and, in addition, to enjoy a period of relaxation and leisure (ECJ judgment of 20 January 2009, *Schultz-Hoff*, C-350/06, paragraph 46 and elsewhere). This purpose distinguishes paid annual leave from other types of leave. However, the purpose can only be served if the employee has actually worked. It only makes sense to provide for rest from work if the employee has actually been engaged in work and therefore needs time for rest and relaxation (paragraph 27, 28)

In certain cases, the member states may not make the granting of paid annual leave conditional on the actual performance of work. This is the case, for example, with duly documented incapacity to work due to sickness (ECJ judgment of 24 January 2012, *Dominguez*, C-282/10, paragraph 30). Times of absence due to sick leave are therefore equivalent to times when work was actually performed (paragraphs 32, 33).

Even in the context of maternity leave, actual work does not have to be performed. In the opinion of the ECJ, however, the case law on sick and maternity leave cannot be applied to parental leave. Unlike parenthood, incapacity to work due to sickness is, as a rule, not foreseeable. Parental leave, on the other hand, is granted at the request of the parents. Nor is parental leave taken because the employee suffers from physical or psychological illness. Parental leave is also different from maternity leave, which is intended to protect a woman's biological condition during and after pregnancy and ensuring that the special relationship between a woman and her child is not disturbed by a double burden, that is, the need to continue to work at the same time (paragraph 34).

In addition, according to the ECJ, while the employment contract in the case on hand continues in effect, the employment relationship is suspended pursuant to national law, so that the obligations under the employment contract are suspended correspondingly. Therefore, in a case as this one, the period of parental leave cannot be counted as equivalent to the period during which work was actually performed (paragraph 35).

Summary and conclusion

Parental leave is therefore not equivalent to a period during which work is actually performed, at least if no other rights and obligations can be derived from the employment contract during this period. In the opinion of the European Court of Justice, parental leave is not comparable to sickness-related absences or absences in connection with pregnancy and childbirth.

If, under a national rule, the employment contract is therefore suspended during parental leave, it is permissible for paid annual leave entitlements to also lapse. This type of rule is not in violation of European law.

Contact address

Katharina Talmann
Solicitor
Ratajczak & Partner mbB
Berlin · Essen · Freiburg i. Br. · Köln · Meißen · München · Sindelfingen
Posener Straße 1 · 71065 Sindelfingen
Germany

Digital technology in implantology and implant prosthodontics

Where are we today?

PROFESSOR FLORIAN BEUER, MME, BERLIN, GERMANY

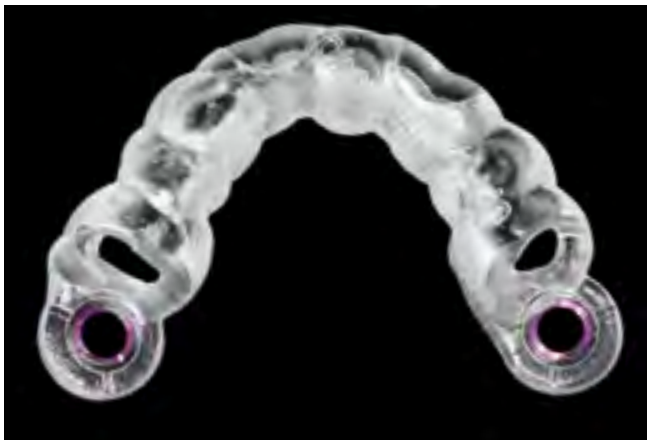
The digital transformation may have changed our lives like nothing has before. In implant therapy in particular, we benefit greatly from digital technology. Its indications and possibilities will be explained in this article.

Three-dimensional imaging techniques are increasingly being used in implant diagnosis and planning. On the one hand, these techniques facilitate the precise preparation of the implant placement procedure. On the other hand, the combination of intraoral surface data also allows three-dimensional planning of implant positions on the basis of the future prosthetic restoration. The translation of the position or positions thus obtained into the actual surgical site is now routinely performed by so-called static navigation. However, promising dynamic concepts have also been introduced or are about to be introduced commercially. The dental prostheses are mainly realized using digital manufacturing technology. The development of monolithic materials in particular has driven this technology in recent years. In principle, it is also possible to fabricate a restoration directly, based on the planning data – or in other words, to fabricate it ahead of the actual implant placement. Of course, this is not feasible or appropriate in all situations; the indications and possibilities will be explained in the present article.

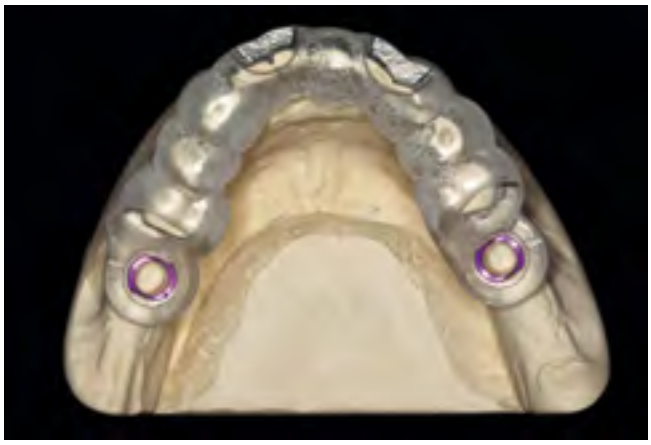
Implant planning

The rules for patient selection and the indications for dental implants have not changed with digitization – a fact we need to keep in mind before we embark on planning an implant-supported restoration. Another important aspect of both analogue and digital procedures should be the selection of the number of implants and their positions – as well as the implant system and material – on the basis of prosthetically guided planning. Since our laboratory partner is the one who will actually fabricate the implant-supported dental prosthesis, they should be involved as early as during the planning phase. If we decide that a case should be planned three-dimensionally and that guided placement approach should be followed, we must ensure that the following prerequisites are met:

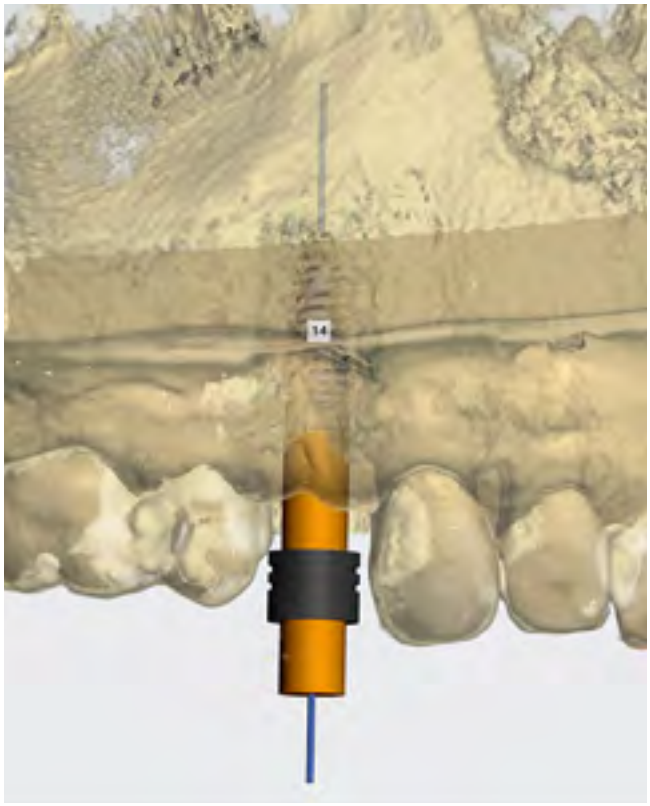
1. First, a data set of the *three-dimensional bone structure* must be created by a computed tomography scan (CT) or a cone-beam computed tomogram (CBCT). CBCT is generally preferred today, although certain indications can still make the use of the CT preferable. The German S2k guideline on cone-beam computed tomography is in the process of being revised; it should be published at the end of 2019.
2. In addition, *data describing the intraoral surfaces* are required. These can be acquired either by way of an intraoral scanner [7,13] or by a laboratory scan of the physical diagnostic cast [1]. If a diagnostic cast is available, this will subsequently facilitate the adaptation of the surgical stent (drilling template). Even if the surface data were obtained via the intraoral scanner, the surgical stent created based on these data can still be adapted to the diagnostic cast. This greatly increases the likelihood of the surgery going smoothly, without any intraoperative adjustments (Figs. 1 and 2).
3. The data obtained are then superimposed using *a planning program* (a process called "data matching"). If a physical wax-up of the future restoration was prepared, it will also be scanned and included (Fig. 3). Alternatively, a virtual wax-up can be created and used in the planning or computer-aided design (CAD) program. A simulation of the future dental prosthesis serves as the starting point for planning the implant positions. An appropriate implant is selected from an implant library that is a constituent of the planning program and placed within the virtual model. An adjustable "safety cylinder" will also be defined to take into account the average deviations and planning errors. Graphic manipulation options such as making objects visible, invisible, or semi-transparent ensure that the bone and the virtual prosthetic planning can always be placed in plain view as needed.
4. The next step is *implementing the planning result* in clinical reality, a procedure that is aided by surgical stents. As these stents do not allow the implant position to be adjusted to any previously invisible obstacles or other details during implant placement, this technique is referred to as static navigation. The surgical stents are manufactured by computer-aided manufacturing (CAM), a process that almost exclusively uses additive



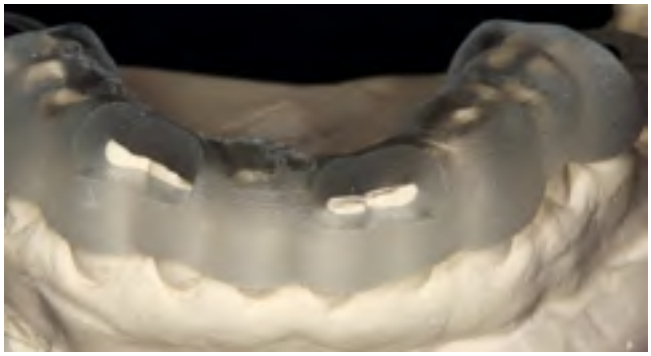
1 I Surgical stent (drilling template) for static navigation with two inserted guide sleeves.



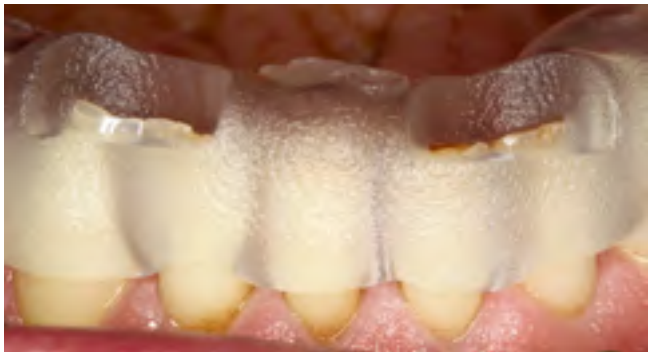
2 I Surgical stent adapted to diagnostic cast.



3 I Visualized superimposed data of the bone situation, intraoral surfaces and planned implant.



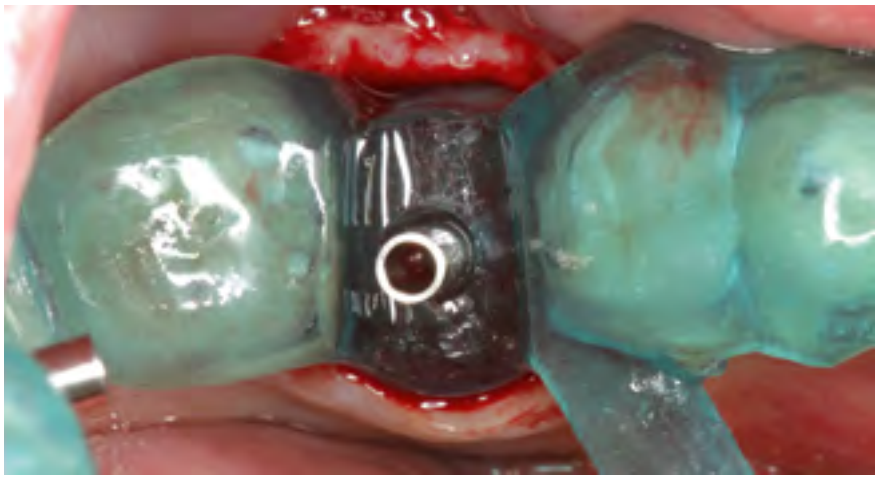
4 I Recessed areas in the surgical stent for checking the fit on the cast.



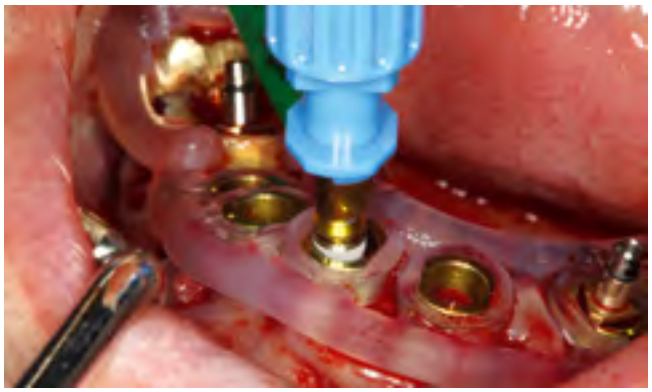
5 I Recessed areas in the surgical stent for checking the fit in the mouth.

manufacturing techniques (3-D printing) today. A second option is dynamic navigation. Here, the position of the contra-angle handpiece – and therefore the position of the drill – is constantly compared with the previously planned position and visualized for the dental surgeon [5]. This allows corrections to be implemented at short notice. Furthermore, this technique is also suitable for surgical challenges beyond oral implantology, such as minimally invasive approaches to the removal of displaced teeth. But at this point, static navigation is certainly still the most widely used method.

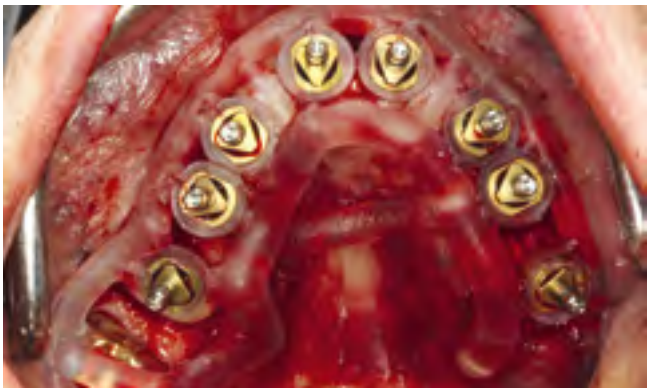
5. If static navigation is used, a *defined, stable rest position for the stent* must be ensured during implant placement. In partially edentulous patients, resting the stent on the residual teeth is therefore recommended. Small recessed areas ("windows") can be used to verify the correct positioning of the stent (Figs. 4 and 5). If there are fewer than three teeth or no teeth left and no stable position can not be guaranteed, the stent might therefore be supported on the alveolar bone, or else temporary implants can be inserted to support both the stents and any temporary restorations.



6 I Surgical stent to guide the pilot drill.



7 I Guided implant placement through the surgical stent.



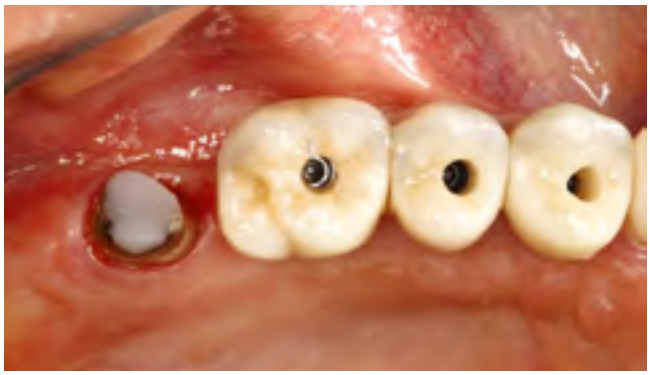
8 I Eight implants placed through the surgical stent.

Over the past five years, the use of facial scanners for implant planning has shown itself to be helpful in complex situations. Here, not unlike in orthodontics, the patient's face has been included in the planning of extensive reconstructive efforts for some time now [9]. The digital data described in points 1 and 2 above are supplemented by data relating to the patient's face, making virtual try-ins of the future prosthetic reconstruction possible as early as during the planning stage [12].

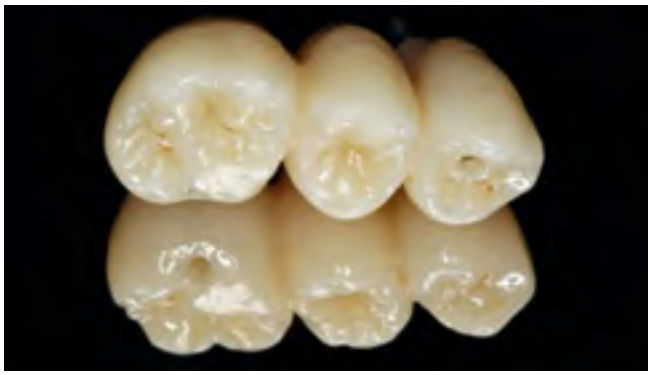
But is three-dimensional planning really indispensable? This question does not have an unequivocal answer. On the one hand, implantology was also very successful in the "pre-digital" era, something that greatly contributed to the generally high acceptance and popularization of implant dentistry. On the other hand, digitally planned and guided implants offer clear advantages, such as shorter durations of individual procedures, less post-traumatic pain and lower overall treatment cost [4,6]. Despite intensive planning, guided implant placement is not regarded to be technically less demanding than the classical treatment protocol [6].

When we speak of statically guided implant positioning, there are a number of fundamentally different approaches to how much support the surgical stent is expected to provide:

- *Guiding the pilot hole with or without a depth stop*: The inclination of the implant axis or – if necessary – the insertion depth are the primary parameters transferred (Fig. 6). The implant position can still be minimally adjusted by the subsequent free-hand preparation with the surgical drills. The present author believes that this type of transmission without a depth stop is suitable for use in particularly critical situations, such as the anterior maxilla. Since the dental alveolus is often not accurately outlined on digital radiographs and since the vertical implant position determines the successful creation of the appropriate biologic width around the implant [8], exact placement of the implant under visual control is often advantageous.
- *Guiding the complete drilling sequence*: All drilling steps necessary for preparing the implant site are carried out through the surgical stent. This provides a high degree of safety during the procedure but leaves no room for any intraoperative adaptations or changes to the implant position.
- *Guiding the complete drilling sequence and the insertion of the implant itself*: In this variant, both the complete drilling procedure and the placement of the implant are performed through the surgical stent (Figs. 7 and 8). When comparing the targeted and actual positions of implants inserted with this method, we find that these implants are placed more accurately than those using the two other techniques mentioned above [5].



9 I Screw-retained lithium disilicate abutment crowns before closing the access hole.



10 I Screw-retained three-unit bridge made of monolithic stained zirconia. The size of the screw access holes is minimal.

According to the current state of the art, the indications for guided implant placement are as follows:

- Support for minimally invasive techniques for patients presenting special risks
- Situation after complex maxillo-mandibular reconstructions
- Support for the implementation of a complex prosthetic objective
- Certain other concepts

These recommendations are based on the S2k guideline on indications for radiological 3D diagnostics in oral implantology and navigation-assisted implant placement, which has expired but is currently being revised.

Fabrication of the restoration

Particularly in connection with fixed restorations, superstructures can now be produced using a partially or even completely digital workflow. A variety of restoration materials for this purpose have been introduced in recent years. There is a clear trend towards monolithic, metal-free materials. If two-layer restorations are to be fabricated – as mandatory for replacing, for example, single anterior teeth – the framework is created digitally, while the crown and other structures are created manually. However, attempts have already been made to fabricate this type of restoration almost completely digitally. However, the relevant concepts are still more or less in the prototype stage [11]. Today, screw-retained abutment crowns made of lithium disilicate, which can be fabricated monolithically in a completely digital, model-free workflow, are standard for restoring single teeth (Fig. 9). On the one hand, restorations of this type appear to have sufficient mechanical stability to withstand masticatory forces. On the other hand, studies have shown that they protect the implant from possible damage because they are less stable than the implant shoulder [10]. It may sound trivial, but we often forget that the superstructure should actually be the weakest part of the unit consisting of the implant and prosthetic restoration in the event of a mechanical failure.

With bridges, this plays a subordinate role due to the primary splinting of the implants and the distributed masticatory forces. Here, the new zirconia materials are used – they provide attractive aesthetics without veneering due to their good translucency and they are expected to result in lower complication rates than veneered restorations thanks to their mechanical strength (Fig. 10). Enough long-term scientific data are not yet available for a final assessment, but the first results are very positive. All kinds of bridge variants can be fabricated using this treatment concept, even full-arch rehabilitations. Discussing the choice between screw retention and cementation would carry the present discussion too far; suffice it to say that today's digital techniques allow both options.

Outlook

What kind of potential is still waiting to be unleashed when it comes to the digitization of implant therapy? One trend is that towards custom (individualized, patient-specific) implants that can be produced from digital data, modelled on the tooth to be extracted. This technique has shown very promising results in a first pilot study, which will be published no later than early next year. Another trend is likely to be dynamic navigation, which experts already regard as more accurate than static navigation and ascribe it much greater potential [2,3]. There is a clear trend towards additive procedures in the CAD/CAM fabrication of dental prostheses, a technology currently used predominantly for metal. However, it will certainly be possible in the future to process multi-layer tooth-coloured materials additively and simultaneously.

Despite all the euphoria, the present author believes that there are two essential points to be made: future digital procedures must offer a clear clinical advantage not only for the dentist, but above all for the patient. And perhaps another, no less important point is the fun and challenge enjoyed by everyone who is involved in these developments.

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

Contact address

Professor Florian Beuer, MME
Department of Prosthodontics, Geriatric Dentistry and Craniomandibular Disorders
Charité – Universitätsmedizin Berlin
Aßmannshauser Straße 4–6
14197 Berlin
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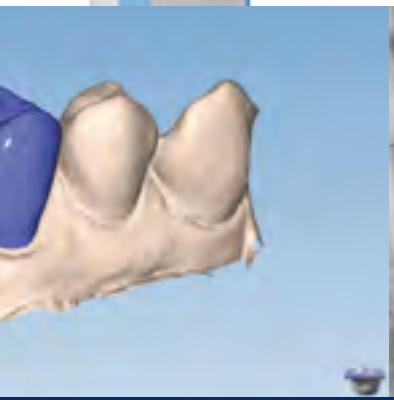

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FORM-Lab (Frankfurt Orofacial Regenerative Medicine)

Tissue regeneration by PRF

SARAH AL-MAAWI, FRANKFURT AM MAIN, GERMANY

Tissue regeneration is at the forefront of every surgical procedure. Regardless of whether the tissue loss (bone or soft tissue) has been caused by trauma, atrophy or tumour removal, regenerative concepts are needed to restore tissue function by means of functional wound healing. In order to develop innovative treatment concepts for the patient, different approaches to regenerative medicine are researched on a daily basis at the FORM-Lab (Frankfurt Orofacial Regenerative Medicine), the research laboratory of the Department for Oral, Cranio-Maxillofacial and Facial Plastic Surgery at Johann Wolfgang Goethe University Hospital at Frankfurt, Germany (Clinic Director: Professor Robert Sader).

Under the direction of *Professor Shahram Ghanaati* (Deputy Clinic Director), an interdisciplinary team of biomaterial scientists, biologists, and clinicians work on various issues of wound healing and soft-tissue and bone regeneration on a surface of about 300 square metres. Following a translational research chain, biomaterials such as skin and bone substitutes as well as collagen-based biomaterials are followed through their development phase and systematically investigated through a continuous research chain (ex vivo, in vitro, in vivo and in clinical studies) from the production site to their clinical use in patients ("bench to bedside").

1 I Research into regenerative medicine at the FORM-Lab at Goethe University of Frankfurt, Germany.

The FORM-Lab builds on the research results of *Professor Ghanaati* obtained in Mainz at the Institute of Pathology (Johannes Gutenberg University at Mainz) while establishing the in-vivo group. Starting in 2007, the know-how was transferred to Frankfurt along with some members of the team to gradually build up a translational research chain at the new site (Fig. 1). Today, investigating and understanding the physiological and pathological tissue response to biomaterials is a mainstay of biomaterial-based tissue regeneration research at the FORM-Lab. The laboratory research is mainly financed by third-party funding. The projects are supported by government collaborative projects, international cooperation within the framework of the German Research Foundation (DFG), the German Federal Ministry of Education and Research (BMBF) and EU-funded projects, as well as through cooperative agreements between academic researchers and the industry.

Translational research

The scientific research in which the lab engages is ultimately geared toward optimizing future clinical use in patients. While *Ghanaati* is works daily in the operating theatre on the actual reconstruction of skin and bone tissue after tumour resection in patients, his research team in the laboratory works on improving our understanding of biomaterial-based regeneration using preclinical in-vitro and in-vivo models that might have the potential for translation into clinical practice. This will provide scientific evidence for the possible future application of innovative regenerative concepts in patients. One of the goals is to establish biomaterial-based regeneration for tumour patients in order to minimize the number of autologous tissue grafts, thus reducing patient morbidity. The FORM-Lab is characterized by close networking between research and clinical practice, which ensures that research maintains a clinical orientation. There is a regular exchange between researchers and clinicians aimed at finding solutions for clinical problems and at developing clinically relevant research goals.

Interdisciplinar collaboration

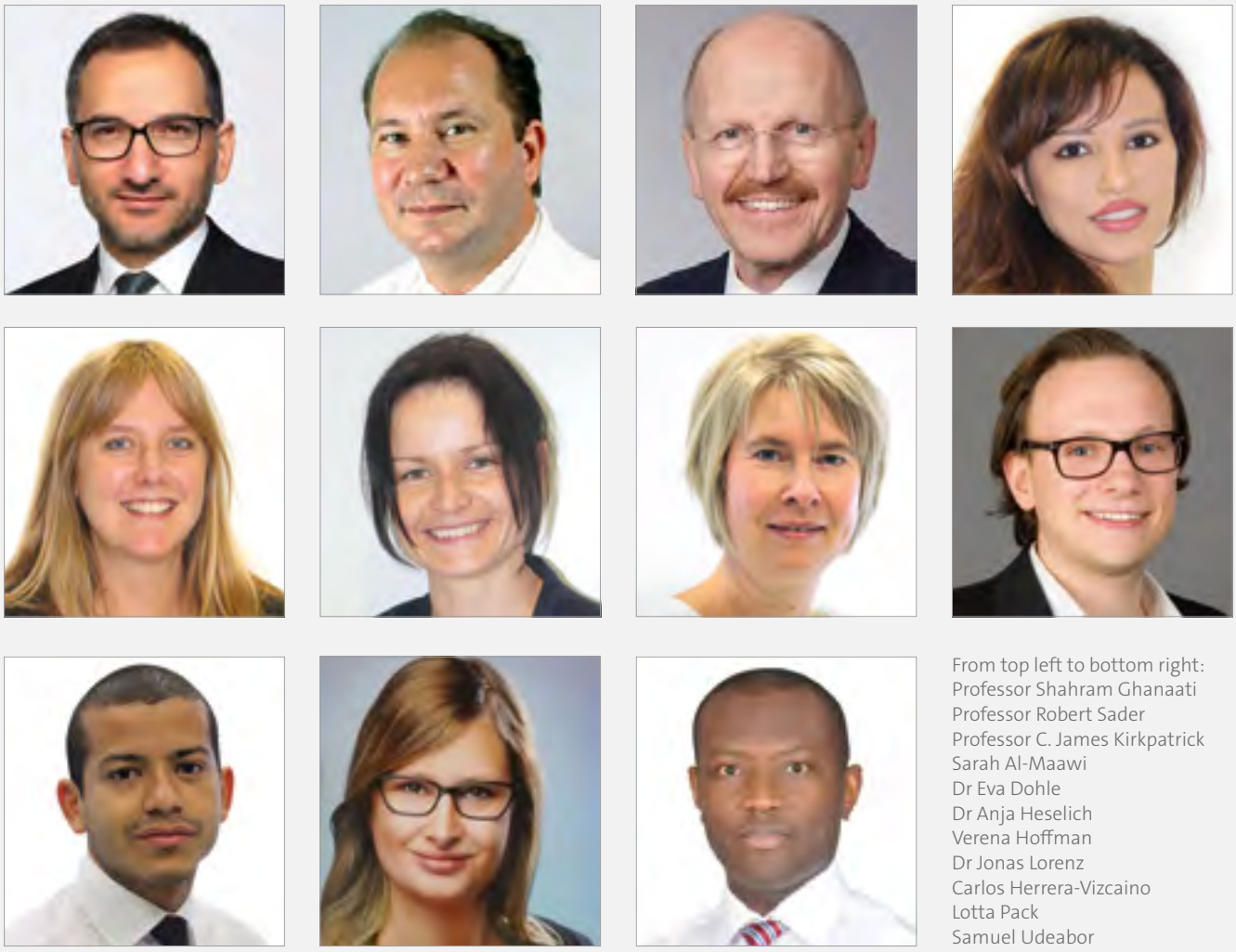
A network consisting of members from different medical disciplines is essential for successful translational research. The FORM-Lab and its internal and external

partners form a network of clinicians and scientists involved in biomaterial-based regeneration, investigating different aspects of bone regeneration and bone metabolism in different anatomical locations. In this way, research efforts into jawbone regeneration can yield more profound results with the assistance of partners within oral and maxillofacial surgery, and the same is true of research tubular bone regeneration, which is investigated together with partners from the field of trauma surgery. Furthermore, external partners such as biomaterial scientists and engineers play an important role in understanding the influence of physicochemical properties of biomaterials, such as size, shape, porosity and surface area, as well as their modification, to modulate the tissue response. Subsequently, newly developed or modified biomaterials can be investigated by the translational research chain and optimized in a cooperative effort.

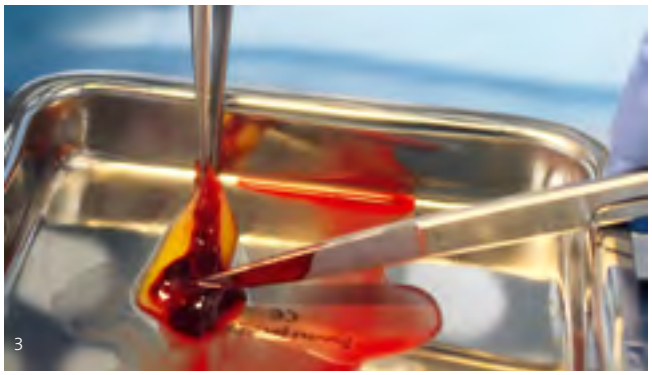
In addition to biomaterials, which function mainly as a type of guide structure or scaffold, other essential factors are needed in the search for optimal conditions for regeneration. The cells and the signalling molecules (such as growth factors) are worth mentioning in this context. Clinicians and biologists are working towards developing clinically relevant tissue engineering concepts. However, the use of pre-vascularized or cell-colonized scaffolds for everyday clinical use is almost impossible because this can be very time-consuming. As a clinically relevant alternative, blood concentrates that can be made by centrifuging the patient's own peripheral blood provide many uses. At the FORM-Lab, the centrifugation protocols of the blood concentrates – especially platelet-rich fibrin (PRF) – are investigated and further developed. The aim is to define indication-specific centrifugation protocols for the use of PRF in different areas of regenerative medicine.

In this context, a clinical working group was initiated to investigate the biomaterial-based and PRF-based regeneration of hard and soft tissue to examine the regenerative effect of PRF for various indications in surgical dentistry, periodontology and temporomandibular

The FORM-Lab team

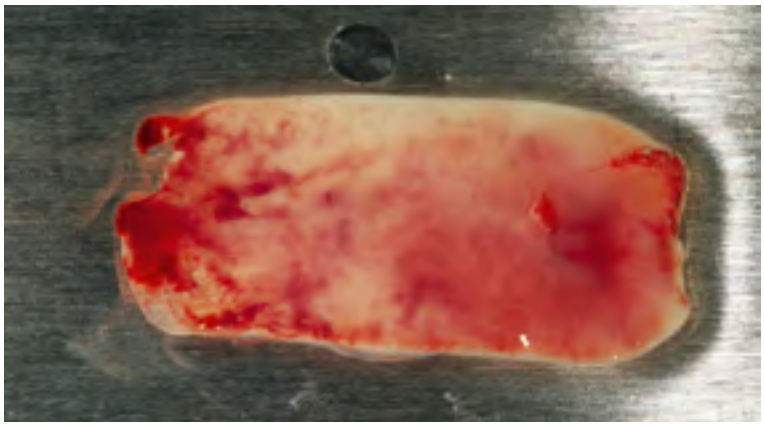


From top left to bottom right:
Professor Shahram Ghanaati
Professor Robert Sader
Professor C. James Kirkpatrick
Sarah Al-Maawi
Dr Eva Dohle
Dr Anja Heselich
Verena Hoffman
Dr Jonas Lorenz
Carlos Herrera-Vizcaino
Lotta Pack
Samuel Udeabor



2 I PRF tubes for the production of solid (red) and liquid (orange) PRF. 3 I Unpressed PRF matrix.

4 I Pressed PRF plug.



5 I Pressed PRF matrix.

6 I Combining the solid PRF with a bone substitute material (Bio-Oss, Geistlich Biomaterials).

joint therapy. Clinical observational studies and histological examinations are carried out in cooperation with national and international partners. In this case, the connection to the lab was originally established because it had performed histological examinations of clinical samples from various clinical studies.

The clinical working group offers university and private clinicians the opportunity to exchange information and discuss their documented cases with scientists and other clinicians. The resulting network of research and clinical practice creates a feedback loop that is essential for success in translational research.

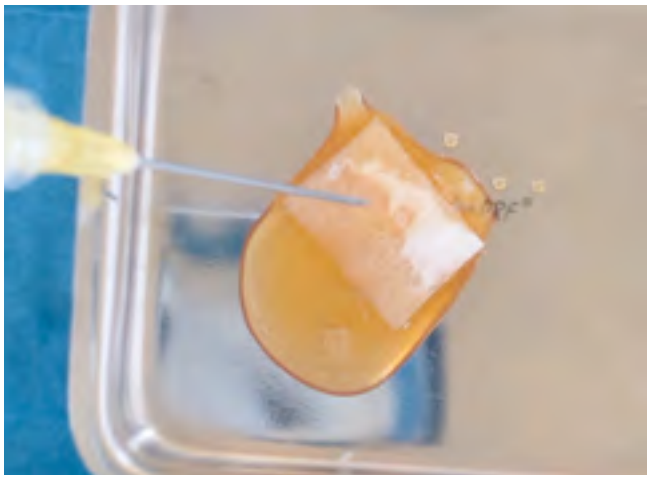
Single-centre and multi-centre controlled clinical studies are currently underway involving internal university partners and practising dentists and oral surgeons, coupled with histological examinations performed at FORM-Lab to establish further scientific evidence.

Scientific background

Any understanding of biomaterial-based regeneration begins with wound healing. The biomaterials are introduced into a surgically created "wound" and are supposed to support the regeneration of the tissue in addition to promoting wound healing.

Therefore, the tissue response to biomaterials is essential for the further course of regeneration. Countless studies of biomaterials (bone substitutes, collagen-based biomaterials and barrier membranes) have shown that the tissue response depends on the above-mentioned physicochemical properties of the biomaterials [1]. Two different types of tissue response were observed. A physiological reaction occurs when biomaterials induce only such mononuclear cells that physiologically participate in wound healing (macrophages, monocytes and lymphocytes) [2,3]. Biomaterials that induce only mononuclear cells are incorporated into the defect and undergo tissue integration. The vascularization pattern is rather mild [4,5].

Another type of tissue response is associated with a foreign-body reaction. This induces not only physiological mononuclear cells but also multinucleated foreign-body giant cells [6,7]. Biomaterials that induce foreign-body giant cells undergo early degradation and disintegrate, a process accompanied by a high vascularization rate closely related to the foreign-body reaction. Our understanding of the cellular response of biomaterials and their inflammatory patterns are of great importance to both scientists and clinicians [8]. These findings could more precisely define indications for biomaterials in order to optimize clinical outcomes and to assess how biomaterials should be used as a function of the morphology and location of the defect.



7 I Combining a collagen-based matrix with the liquid PRF.

8 I Collagen-based matrix (Mucograft, Geistlich Biomaterials) after combination with either a saline solution (left) or the liquid PRF (right).

Blood concentrates are a clinically relevant approach to increase regeneration and support the vascularization of biomaterials that induce a physiological reaction [9]. Over the last eight years, intensive studies of platelet-rich fibrin (PRF) have established a correlation between the centrifugal force applied during production and the bioactivity and composition of the PRF, accompanied by the development of the so-called low-speed centrifugation concept (LSCC) [10,11]. This concept implies that an accumulation of blood cells (platelets and leukocytes) and growth factors in the resulting PRF matrices can be achieved by reducing the centrifugal force applied. This can significantly improve the release of growth factors compared to blood concentrate systems produced by high centrifugal forces [10]. The use of bioactive PRF and its combination with biomaterials can be supported by vascularization of the biomaterial, which can improve the regeneration of the defects. Ongoing controlled clinical studies are currently investigating the effect of the LSCC and its possible clinical superiority.

Clinical use of platelet-rich fibrin

PRF is produced by centrifuging the patient's peripheral blood (Table 1). Depending on the type of tube used and the centrifugation protocol, solid or liquid PRF matrices (or both) can be produced (Figs. 2 and 3). The possible clinical applications of the solid and liquid matrices in oral and maxillofacial surgery are many. PRF can be used alone or in combination with collagen-based biomaterials and bone substitutes.

Solid PRF matrices can be used as autologous material for socket preservation after processing in PRF plugs (Fig. 4). Furthermore, solid PRF matrices in pressed form (Fig. 5) can be used as wound dressings after the removal of mucosa or on perforating the Schneiderian membrane during a sinus lift procedure. In aesthetic periodontal therapy, pressed solid PRF matrices are applied alone or in combination with biomaterials to cover recession areas. Solid PRF matrices can also be combined (crushed) with bone graft substitutes added (Fig. 6). This autologous bioactive component (PRF) and the release of many growth factors are intended to support regeneration.

Liquid, injectable PRF matrices (i-PRF) can be used in periodontal therapy. Furthermore, they are mostly used in combination with biomaterials, where acellular and avascular biomaterials are made to function, or bioactivated, by the patient's own PRF. i-PRF offers ease of handling in liquid form, but will coagulate in 10 to 15 minutes, forming a solid PRF biomaterial (Figs. 7 and 8). ■

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

Protocol	RPM	RCF	Time
High RCF	2,400	710 xg	8 min
Medium RCF	1,200	177 xg	8 min
Low RCF	600	44 xg	8 min

Table 1 I Centrifugation protocols according to the low-speed centrifugation concept. RPM: revolutions per minute. RCF: relative centrifugal force. All data refer to a centrifuge with a fixed motor angle and a radius of 110 mm.

Contact address

Sarah Al-Maawi
FORM-Lab
Medical Center of the
Goethe University
Theodor-Stern-Kai 7
60596 Frankfurt
Germany
Sarah.Al-Maawi@kgu.de

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Comparison of the outcomes of guided implant placement between experienced and novice users

A safe and predictable treatment option for experts and beginners

MARCO TALLARICO[1], MATTEO MARTINOLLI[2], METODI ABADZHIEV[3], FABIO COCCHI[4], YONG-JIN KIM[5]

Since its introduction in the mid-1990s, computer-guided template-assisted implant placement has gained in popularity [1-3]. The introduction of cone-beam computed tomography (CBCT), enabling volumetric jaw-bone imaging at reasonable cost and low radiation doses [4,5], made it possible to collect large amount of preoperative information [6]. Indications for guided implant placement include a need for minimal invasive surgery or a flapless approach or optimized prosthetically driven implant placement and immediate restoration [7,8]. Guided implant placement has also been recommended in critical anatomic situations [8].

Guided implant surgery is growing in popularity due to a higher transfer accuracy of the virtual plan to the surgical site, compared to freehand placement [9]. It has increased the accuracy of placement and improved patient satisfaction [8,10].

The introduction of new digital technologies, open-source software, and simplified protocols have reduced the cost of most systems for surgical guide fabrication and increased its popularity with novice users. But accurate guided implant placement must be based on a stringent workflow. Small errors at any step of the process can contribute to relevant deviation from the planned implant position [11]. Therefore, knowledge of the potential maximum implant deviation of these systems is highly relevant to daily clinical practice [10]. The Proceedings of the 5th Consensus Conference of the International Team for Implantology on guided implant surgery report a mean inaccuracy of 1.12 mm at emergence level and 1.39 mm at the apex, with maximum values of 4.5 mm and 7.1 mm, respectively [12]. Individual errors, from data acquisition to errors during template placement and movement of the template during drilling, including human error, can also affect accuracy [13].

The aim of the present prospective study is to compare the virtual planning accuracy and template-related complications between expert and novice users of guided implant placement. The null hypothesis was that there would be no differences between groups.

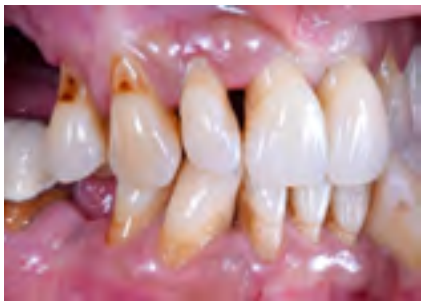
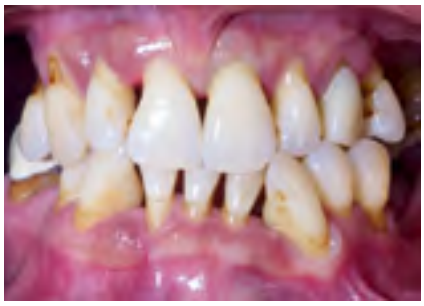
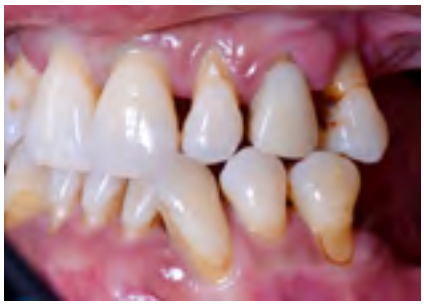
Materials and methods

This study was designed as a comparative study aimed to evaluate implants placed by expert clinicians and novice users. This study was conducted at one centre between September 2017 and May 2018. The study protocol was approved by the Institutional Review Board of Aldent University (Tirana, Albania) (2/2017).

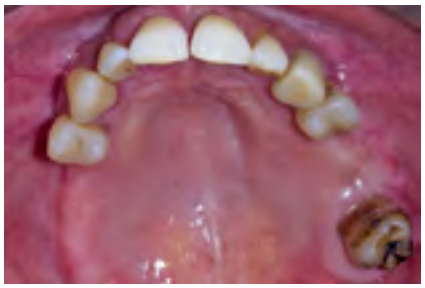
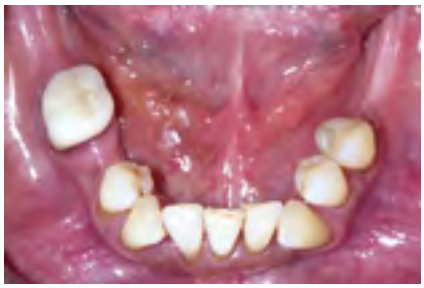
This trial is reported in accordance with the STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) guidelines. Any partially edentulous patient, aged 18 years or older and able to sign an informed consent, in need of an implant-supported fixed restoration was considered eligible for this study and consecutively enrolled.

Patients were divided into two groups. The first group included private patients treated by a clinician with expertise in guided implant placement (MT). The second group included private patients treated by clinicians without expertise in guided implant placement (first

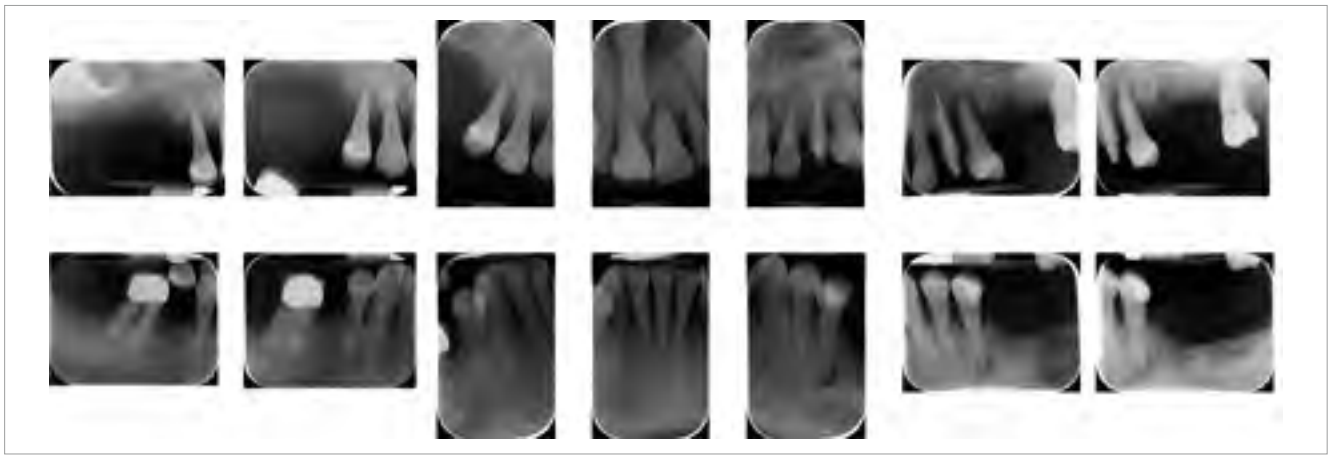
[1] DDS, MSc in Dentistry programme; Adjunctive Professor, Implantology and Prosthetic Aspects, Aldent University, Tirana (Albania); private practice in Rome (Italy)
[2] DDS, PhD; private practice in Porto Viro (Italy)
[3] Assistant Professor, Department of Prosthodontics and Orthodontics and Deputy Chair, Centre of Oral Implantology, Faculty of Dental Medicine, Medical University of Varna (Bulgaria)
[4] ME; private practice in Modena (Italy)
[5] DDS, MMSc; director of Ilsan Apsun Dental Clinic (South Korea)

1a to c I Preclinical scenario: frontal and lateral views.

2a and b
Preclinical scenario: occlusal views.



3 I Preclinical scenario: full-mouth radiographs.

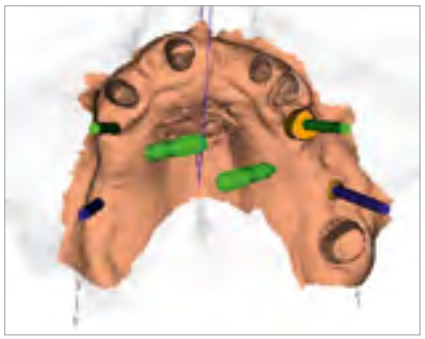
procedures) during a practical course, at the same dental clinic, assisted by an expert clinician (MT).

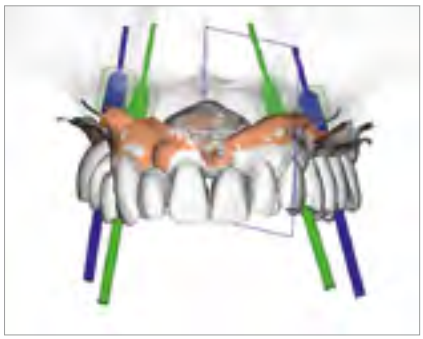
Any implant position based on individual patient requirements was considered eligible for the present trial. Patients were not admitted to the study if any of the following exclusion criteria were present: general medical contraindications to oral surgery (ASA class III or IV), irradiation in the head and neck area less than one year before implantation, psychiatric problems, alcohol or drug abuse, pregnancy or lactation, untreated periodontitis, need for bone reconstruction, severe bruxism or clenching, uncontrolled diabetes, poor oral hygiene/motivation or inability to complete the follow-up. The investigation was conducted according to the principles embodied in the Helsinki Declaration of 1975 for biomedical research involving human subjects, as revised in 2013. All patients were informed about the nature of the treatment and their written consent was obtained. Data collection was designed to preserve patient anonymity.

Preoperative photographs, periapical radiographs or panoramic x-rays of all patients were taken for initial screening and evaluation (Figs. 1a to 3).

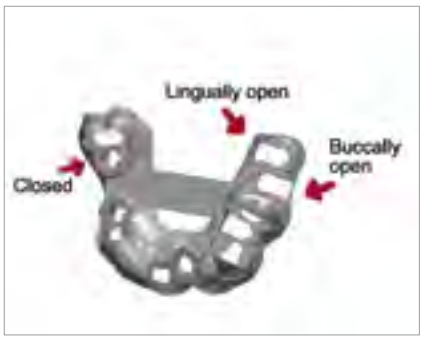
The prosthetically driven planning workflow started by taking a cone-beam computed tomography (CBCT) scan (Cranex 3Dx; Soredex, Tuusula, Finland) of the patient, using a wax bite to separate the dental arches. Then a digital impression was taken using a 3M True Definition Scanner (3M Italia, Pioltello, Milano). The digital data in STL (Standard Tessellation Language) interface format was imported into a 3D design software (exocad DentalCAD; Exocad, Darmstadt, Germany) to create a virtual wax-up meeting the functional and aesthetic requirements.

The STL and DICOM (Digital Imaging and Communications in Medicine) data were imported into a 3D planning software (3Diagnosys ver. 4.2; 3DIEMME, Cantù, Italy). The reprocessed surface





4a and b I Virtual implant planning – occlusal (a) and frontal (b) views.



5 I STL file showing the difference between open and closed sleeves.

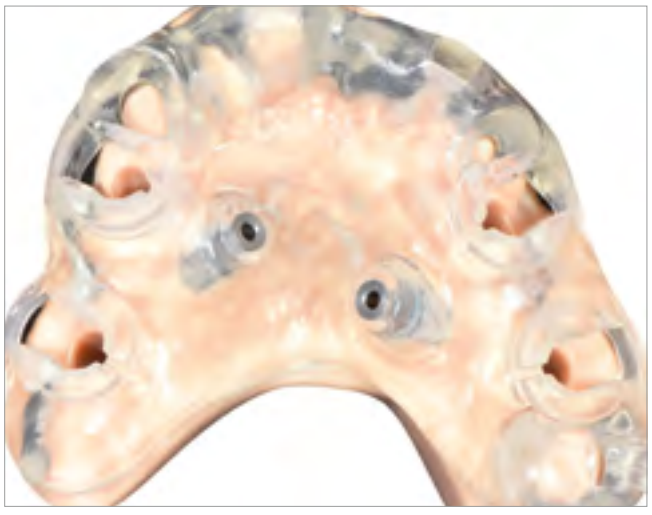
extrapolated from the DICOM data using a Hounsfield scale filter and the surface generated by scanning the master cast or by intraoral scanning were merged using the best-fit repositioning tools of the software (3Diagnosys ver. 4.2; 3Diemme).

At this point, prosthetically driven implants/abutments size and location were planned, taking into account bone quality and quantity, soft-tissue thickness, anatomical landmarks as well as the type, volume and shape of the final restoration. After careful functional and aesthetic evaluation and final verification, the prosthetically driven plan was approved (Figs. 4a and b).

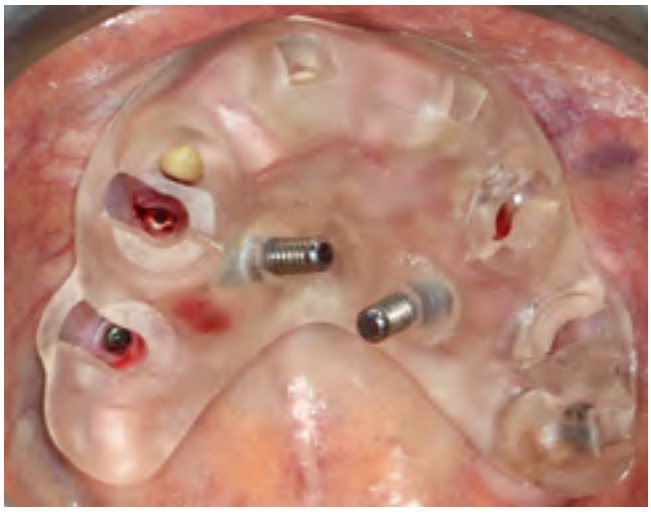
A stereolithographic surgical template was designed (Fig. 5) and fabricated using a more recent rapid-prototyping technology (New Ancorvis, Bargellino, Italy) (Fig. 6). All surgical templates were designed without metallic sleeves using biocompatible dental resin (Dental LT Clear; Formlabs, Somerville, MA, USA) with open windows to accommodate any implants to be placed in restricted occlusal space situations (premolar/molar area). A laterally open outer sleeve was used in the posterior area (again for space reasons), allowing fully guided implant placement.

One hour before implant placement, all patients underwent professional oral tooth cleaning, a prophylactic antiseptic (Curasept, 0.2 % chlorhexidine digluconate; Curaden Healthcare, Saronno, Italy) for one minute, and prophylactic antibiotic therapy (amoxicillin 2 g, or clindamycin 600 mg if allergic to penicillin). The fit of the surgical template was tested directly in the mouth to achieve a stable fit (Fit Checker; GC, Tokyo, Japan). All patients were treated under local articaine anaesthesia with adrenaline 1 : 100,000 administered 20 minutes before surgery. The surgical templates were stabilized in relation to the opposing arch using a rigid surgical index derived from the virtual treatment plan with two to four pre-planned anchor pins. Planned implants (Osstem TSIII; Osstem Implant, Seoul, South Korea) were placed flaplessly or with a minimally invasive flap using dedicated drills (OsstemGuide Kit [Taper], Osstem) (Fig. 7).

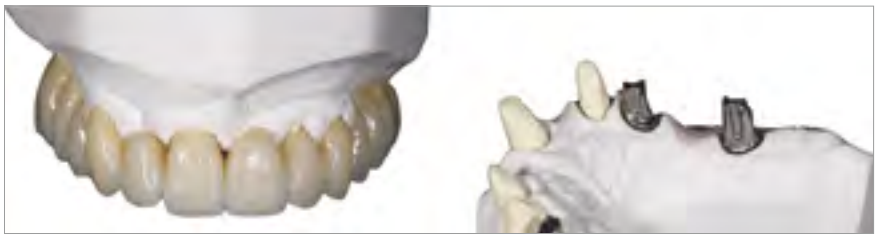
The implant site or sites were prepared based on the bone density evaluated by the surgeon at the first drilling [12]. Any flaps were sutured with Vicryl 4.0 sutures (Vicryl; Ethicon J&J International, Sint-Stevens-Woluwe, Belgium). Immediately after implant placement, digital impressions (3M True Definition Scanner; 3M Italia) were taken at implant level in both groups, using dedicated



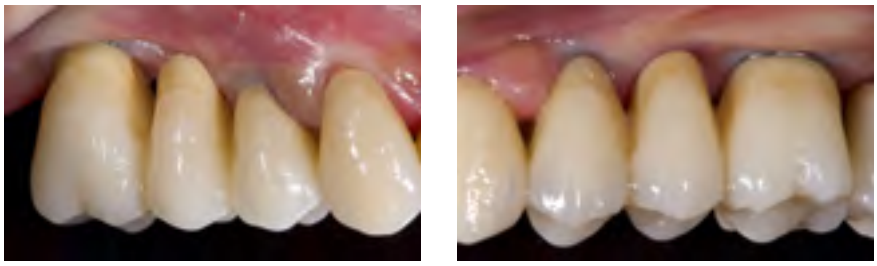
6 I Surgical template with open sleeves.



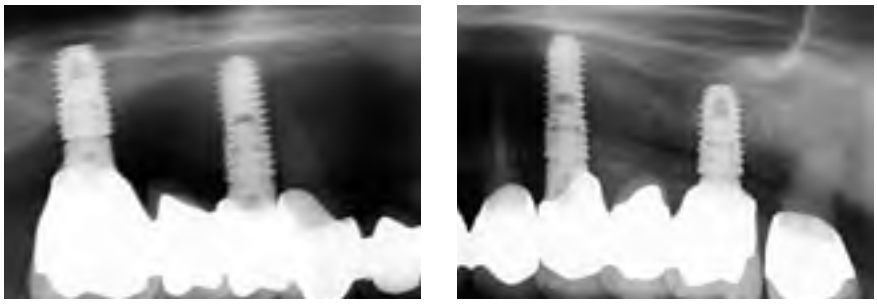
7 I Occlusal view immediately after guided flapless surgery.



8 I Definitive restorations. Cemented fixed dental prosthesis on custom pre-milled titanium abutments.



9a and b I Definitive restorations: lateral views.



10a and b I Definitive restorations: six-month radiographs.

abutments (Scanbody type AQ; New Ancorvis srl), to check the position of the implants placed. Hopeless teeth were extracted at the end of the intervention to improve the stability of the surgical template and to provide more reference points in the postoperative STL files for implant position measurements.

Following implant placement, all patients received oral and written recommendations about medication, oral hygiene and diet. Any sutures were removed 10 to 14 days later after local cleaning using an antiseptic (Curasept, 0.2 % chlorhexidine digluconate; Curaden Healthcare). Four months after implant placement, definitive impressions were taken using a customized open tray (Elite LC tray; Zhermac, Badia Polesine, Rovigo, Italy). Definitive screw-retained restorations were delivered a month later. The occlusion was adjusted to eliminate any premature contacts (Figs. 8 to 10b). Patients were followed every six months for hygiene maintenance and occlusion controls.

Outcome metrics

- Failures: An implant was considered a failure if it had to be removed due to a lack of stability, implant mobility, progressive marginal bone loss or infection or mechanical complications (for example, implant fracture) rendering the implant unusable. The stability of individual implants was assessed during the delivery of the definitive crowns by tightening the abutment screw with a torque of 20 Ncm, and then by percussion testing one year after implant placement.
- Complications: Early surgical and template-related complications (limited access in posterior areas, buccal bone dehiscence due to a mismatched surgical template, insertion of a different implant than planned, and fracture of the surgical template) were recorded. All complications were recorded by the expert clinician (MT) during the follow-up.
- Accuracy: Three deviation parameters (horizontal, vertical, angular) were defined and calculated between the planned and placed implant positions. The postoperative STL file, derived from the intraoral scan, was geometrically aligned with the files exported from the planning software by automated image registration (Dental Scan, ver. 6; Open Technologies, Brescia, Italy) (Fig. 11). The horizontal (lateral), vertical (depth) and angular deviation between virtual and placed implants were calculated along the long axis of each implant. An expert blinded mechanical engineer (FC) performed all the measurements.

Statistical analysis

Patient data was collected in a Numbers spreadsheet (Version 3.6.1 for Mac OS X 10.11.4). A biostatistician with expertise in dentistry analyzed the data using SPSS software for Mac OS X (version 22.0; SPSS., Chicago, IL, USA). A descriptive analysis was performed for numeric parameters using means ± standard deviations and medians with confidence intervals (95 % CI). Complications were compared between the two groups using *Fisher*'s exact probability test.

The mean differences of the overall deviation in clinical outcomes from the plan were compared between groups using the non-parametric *Mann-Whitney* U test. All statistical comparisons were conducted at a 0.05 level of significance.

11 I Comparison between virtual and final implant positions.

Results

A total of 38 patients were evaluated but seven patients were excluded for specific reasons: two due to a need for bone reconstruction, four due to inability to complete the follow-up and one refused to participate in the research.

Preoperative data were collected by the same expert clinician (MT) who also performed the implant planning. In all, 18 patients (13 women, 5 men; mean age, 51.2 years) with 48 implants were treated by the expert clinician and 13 patients (7 women, 6 men; mean age, 49.6 years) with 28 implants were treated by novice clinicians. The expert clinician assisted the novices during the procedures without directly interfering with implant placement. Before surgery, the novice clinicians received intensive theoretical training on guided surgery instruments.

All implants were inserted in healed sites according to the manufacturer's instructions, with insertion torques ranging between 35 and 45 Ncm. By the end of the study, no patients had dropped out, no implants had failed and no complications had occurred.

The final accuracy tests revealed a total mean error in angulation of 2.96° ± 2.28° (range, 0.2°–6.8°; 95 % CI, 1.46°–3.94°) for the expert and 3.61° ± 3.0° (range, 0.2°–11.8°; 95 % CI, 0.97°–4.23°) for the novice clinicians. The difference was not statistically significant (p = 0.5383).

The mean error in the horizontal (mesiodistal) plane was 0.64 ± 0.32 mm (range, 0.2–1.5 mm; 95 % CI, 0.43–0.77 mm) for the expert clinician and 0.97 ± 0.55 mm (range, 0.44–2.53 mm; 95 % CI, 0.59–1.19 mm) for the novice clinicians. The difference was not statistically significant (p = 0.0820).

The mean error in the vertical (apicocoronal) plane was 0.38 ± 0.32 mm (range, 0.08–1.0 mm; 95 % CI, 0.13–0.47 mm) for the expert clinician and 0.40 ± 0.41 mm (range, 0.0–1.3 mm; 95 % CI, 0.0–1.44 mm) for the novice clinicians. The difference was not statistically significant (p = 0.9026).

Subgroup comparison of implant accuracy between expert and novice clinicians revealed no statistically significant differences between both open and closed windows.

Discussion

Several works have been published in recent years on the accuracy of the digital guided implant surgery to scientifically assess these techniques [14]. The present prospective comparative study was conducted to examine the mean error in accuracy between virtual planning and actual implant position for guided implant placement performed by novice clinicians. Both expert and novice clinicians achieved successful results, and no statistically significant differences were observed regarding early implant failure, template-related complications, or implant accuracy.

To the best of our knowledge, at the time of this writing, there were no published similar RCTs or comparative studies. This makes it difficult to evaluate to what extent the present results were consistent with other comparable studies.

The main limitation of the present study was that no a-priori sample size calculation was performed; the limited power of the analysis, due to a limited number of participants, may have hidden some differences between groups.

Nevertheless, the present study is one of the first to evaluate in vivo the virtual planning accuracy for implants placed in guided surgery. All procedures were conducted in a real clinical situation, allowing the results of the present study to be generalized to a larger population with similar characteristics and under similar conditions.

Patients today expect top quality and outstanding aesthetic results, with a minimum number of appointments. To meet these expectations, collaboration within the treatment team and network is crucial.

In the present study, although there was a trend towards higher accuracy achieved by the expert clinician, no statistically significant differences were found. This could be due to careful case planning, an easy-to-use surgical kit and a simplified protocol.

Furthermore, the discrepancy between virtual planning and final implant position as achieved by novice users was found to be within the safety limits of the software for implant planning and comparable with previously published results. In fact, a recent published meta-analysis of in-vitro and in-vivo studies revealed a total mean error of 1.12 mm at the emergence level and 1.39 mm at the apex [12].

The accuracy of guided implant placement depends on several factors, from dataset acquisition to the surgical procedure. Hands-on surgical training is the most important part of implant dentistry, allowing novice clinicians to develop the surgical skills required to accomplish good clinical results and to acquire knowledge about dedicated instrumentation.

The authors would like to underscore that modern computer-assisted template-based implant placement is a safe and predicable treatment option, both for expert and novice clinicians. It is necessary for the novice clinician to pay attention to the learning curve inherent in following the step-by-step protocol. The assistance of an expert clinician in the initial phase could be a valuable step to success.

Conclusions

With the limitations of the present study, novice users can achieve similarly successful results to expert clinicians with computer-guided template-assisted implant placement in combination with the newly developed sleeveless templates and dedicated drills.

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

Contact address

Dr Marco Tallarico
Via Vincenzo Ussani 86
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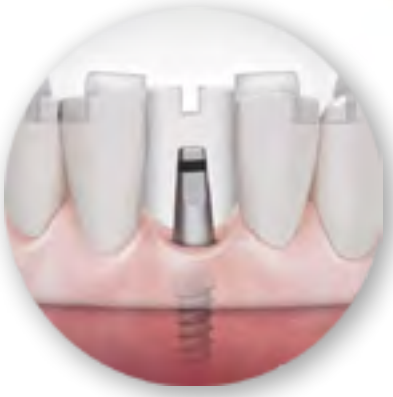

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Immediate loading concept for the edentulous jaw

A proposed new treatment protocol for a new polymer type

DR GIOVANNI GHIRLANDA AND CARLO BARONCINI, BOTH ROME, ITALY

Treatment plans for edentulous patients have changed completely over the 15 years since the first clinical studies and descriptions of the immediate loading procedure in oral implantology. Different protocols have been proposed, but no agreement has been reached so far as to which method is the most suitable one. Furthermore, shortening the time required to complete a temporary restoration could strengthen a patient's motivation to undergo implant treatment. The treatment provider should adjust the procedure with the aim of completing the temporary restoration as quickly as possible. The advent of a new high-performance polymer, BioHPP, with its low specific mass and high loading capacity, has made it possible to provide highly resistant bridge restorations. Based on a clinical case study, the authors suggest a new protocol for immediate loading using a BioHPP framework available within only a few hours of implant placement.

Treatment plans for edentulous patients have changed completely over the 15 years since the first clinical studies and descriptions of the immediate loading procedure in oral implantology.

When *Brånemark* and coworkers defined the paradigms of osseointegration, they advocated avoiding loads on implants for a period of between three and six months [1].

The development of the macro and micro design of implants and the introduction of roughened surfaces – allied with our better understanding of the biological interactions between the bone and the titanium surface – now facilitates the functional integration of an implant even in situations in which immediate provisional was connected to the implant.

In order to make a terminological distinction between loading procedures, the Consensus Conference held in Zürich in 2006 [2] stipulated that the term "immediate loading" was to refer the placement of a functional restoration on an implant within 72 hours of its insertion into the bone.

Numerous studies and reports have been published in the literature that prove the reliability and predictability of immediate loading in edentulous patients. No publications documented any significant differences between conventional and immediate loading procedures [3-7].

Patient compliance with implant therapy is often adversely affected by the time required for the implant to osseointegrate and the need to wear a removable denture during the healing phase to restore aesthetics and function. The possibility of a restoration on an immediate implant can often nudge a decision in the direction of treatment acceptance.

Erkapers and coworkers carried out a study with 51 participants in which the effects of immediate loading on various physiological parameters were investigated immediately before treatment and one year after treatment [8]. The results, which were evaluated using a survey in questionnaire form, showed a significant improvement in the quality of life directly after the treatment.

However, a removable provisional used in the context of conventional loading can result in clinical complications that could compromise implant healing. Soft-tissue dehiscence and peri-implant inflammation are possible complications that frequently occur in edentulous patients during the osseointegration phase. Two preconditions have been cited for the clinical success of immediate restoration: the primary stability of the implant and a rigid and passively fitting restoration.

Ottoni and coworkers, in a retrospective study of 20 immediately loaded single-tooth implants, reported that the success rate of osseointegrated implants was significantly higher when the insertion torque was more than 32 Ncm than at an insertion torque of 20 Ncm [9].

The principle of rigidly connecting (splinting) implants by a provisional is based on the fundamental idea of avoiding substantial micro-movement of the implants. It is assumed that controlled micromovements of 50 to 150 µm do not impair the healing of the bone. If this limit is exceeded, connective-tissue healing of the implant rather than osseointegration becomes the dominant mode.

Chairside vs. laboratory

Over the past few years, various protocols for immediate restoration have been proposed. Implant-supported provisionals can be fabricated either in the dental laboratory based on an impression of the implants or immediately after surgery in a chairside procedure directly in the dental practice. The simplest method is to convert an existing removable restoration into an implant-supported prosthesis that "embeds" the provisional abutment in denture resin, adding an orthodontic wire to strengthen the construction. This chairside procedure has a high potential of prosthetic complications, although it is quick and relatively easy to perform [10]. It should be emphasized that a fracture of the provisional restoration could prevent the osseointegration of the implants during the early healing phase.

On the one hand, the laboratory procedure is precise and well-controlled. It therefore offers several advantages over chairside fabrication of provisional structures, such as a more accurate fit and the integration of metal or fibreglass reinforcements. A well-executed laboratory procedure can produce better aesthetic results. On the other hand, such a procedure requires extensive logistics and planning. Provisional restorations fabricated in the laboratory also require more time to complete and are therefore usually more expensive than chairside provisionals.

Highly performant materials and processes save time

We have treated many patients with advanced periodontitis who required numerous extractions, placing implants at the same time. All patients were willing to accept the proposed treatment once they were assured that they would receive a fixed provisional restoration directly after the extraction of the tooth or teeth. We also found that inserting a fixed bridge after two or three days, followed by swelling and sores, puts a strain on the patient and requires further anaesthesia.

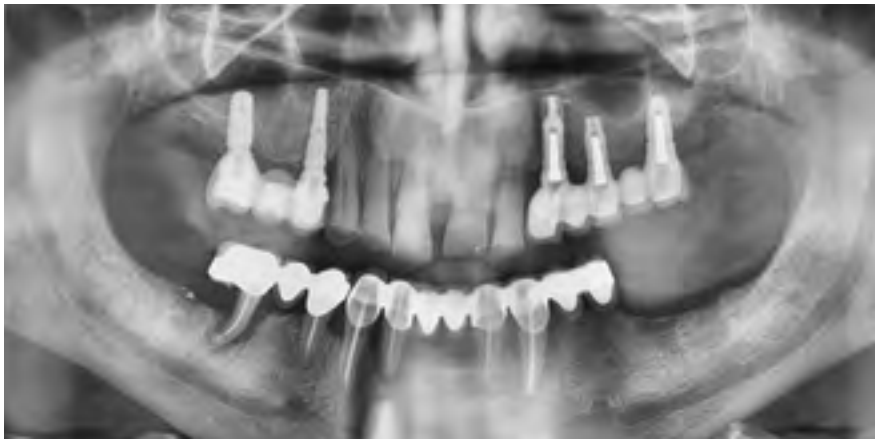
Computer-assisted implantology (CAI) could be an alternative to conventional implant therapy, while also possibly shortening the treatment time. However, it also makes the treatment more complex and therefore increases cost. In addition, the successful fabrication of a predictable and definitive implant-supported restoration within a matter of hours requires the use of high-performance materials that can be processed quickly.

High-performance polymers

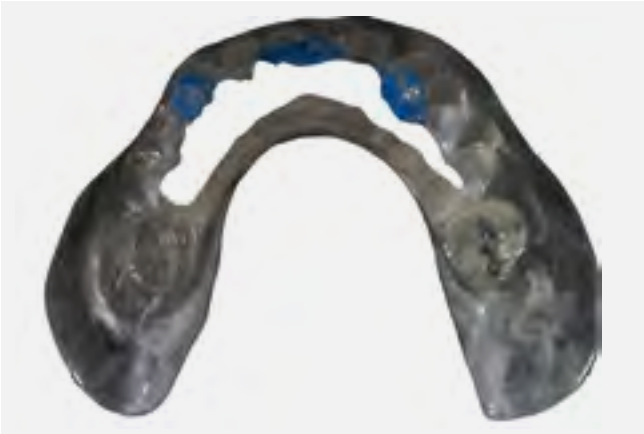
Over the past few years, new high-performance polymers (polymer plastics) have been developed and launched. One of these materials is a polyether ether ketone derivative (PEEK) reinforced with ceramic microparticles, called BioHPP (bredent, Senden, Germany). The main features of this material are a modulus of elasticity between that of cortical and cancellous bone and a low specific mass in combination with very high fracture resistance (> 1,200 N). Other important properties are its high bond strength with composites and, above all, its shade (either white or dentin). These properties allow the material to be used for implant-supported prosthetic restorations. However, BioHPP must be processed in the laboratory as the material is pressed into a mould at 400 °C. On this basis, the objection could be raised that making a prosthesis from BioHPP requires the same amount of time as a metal-reinforced prosthesis. To refute this objection, the authors have developed a new protocol that allows a BioHPP prosthesis to be made and delivered on the day of the surgical procedure. The following case study describes the steps of the protocol for a full-arch mandibular restoration using an immediate BioHPP prosthesis.

Case report

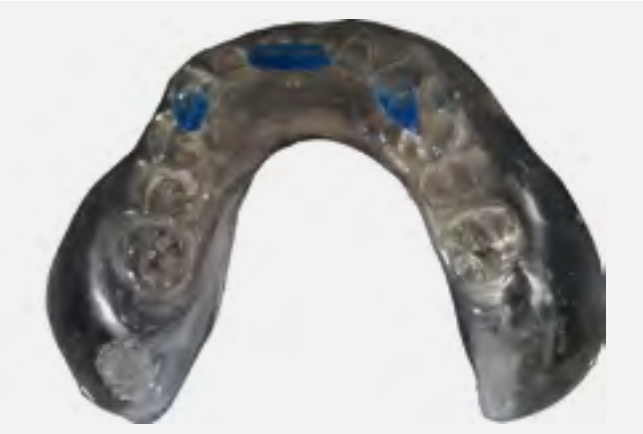
A 74-year-old patient presented with advanced periodontitis. This severely affected the area of the mandibular teeth, where a full-arch metal-ceramic bridge was already present (Fig. 1). The patient already had two implant-supported bridges in the maxilla and therefore also indicated a preference for mandibular implant treatment. He did not want a removable restoration – not even during the provisional phase. For these reasons, a treatment course providing for immediate loading was planned, and CBCT scans were taken. Based on the radiological findings, it was decided to place four implants according to the therapy described by *Maló* and coworkers [11]. The patient was scheduled for a follow-up appointment, at which time an impression was taken and a facebow registration was performed.



1 I Panoramic radiograph before surgery.



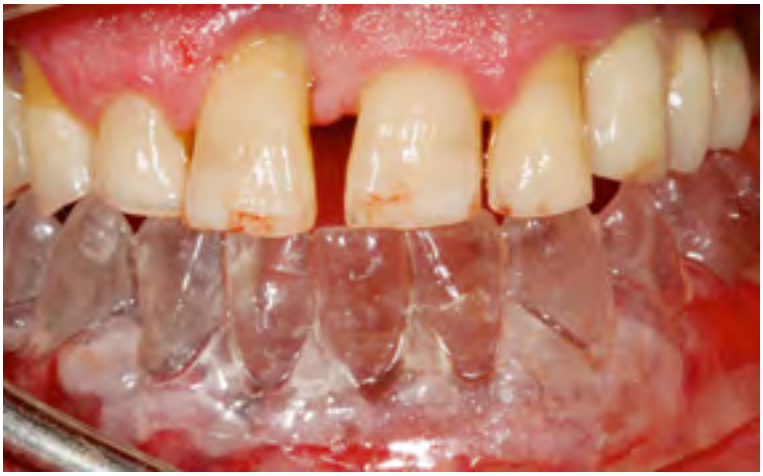
2 I The surgical guide.



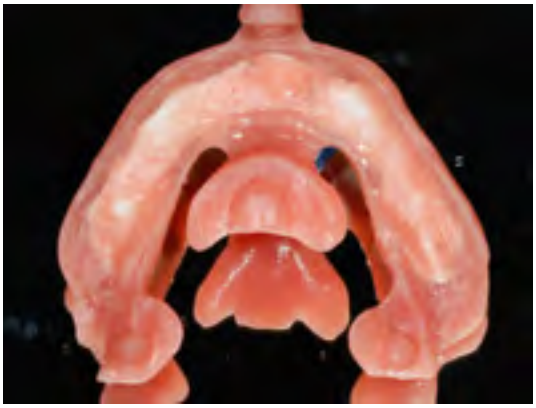
3 I The prosthetic template duplicates the diagnostic wax-up made by the technician.

Preparatory work in the laboratory: wax-up and template production

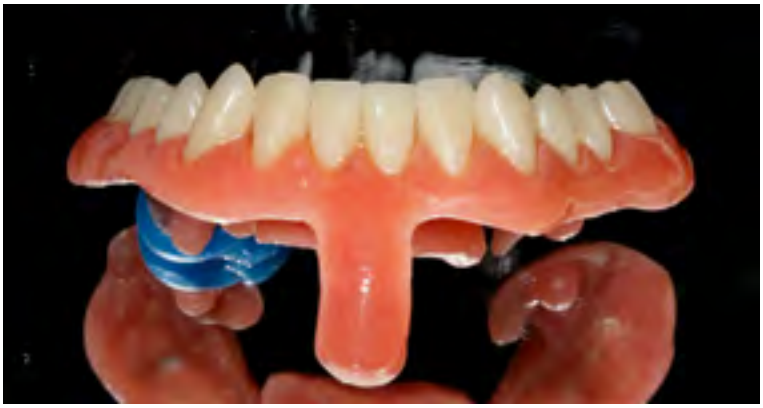
After fabricating and articulating the master casts, a diagnostic wax-up and two templates made of transparent plastic (PikuPlast; bredent) were produced at the laboratory – one surgical guide and one impression template taking the impression during the procedure (Figs. 2 and 3). It is important to make the template larger to allow stabilization during the procedure and to guide the technician precisely when the impression is repositioned on the master cast. The impression template is made entirely of transparent clear plastic. The transmission of light must be supported to connect the prosthetic copings to the impression template by polymerization after surgery. Two or three holes are made to allow the injection of soft impression material under the template after securing the prosthetic copings in place. In a case involving immediate restoration after tooth extraction, like the one described here, the template must be inspected immediately after the extraction to verify the consistency of the patient's centric occlusion with the articulator situation (Fig. 4).



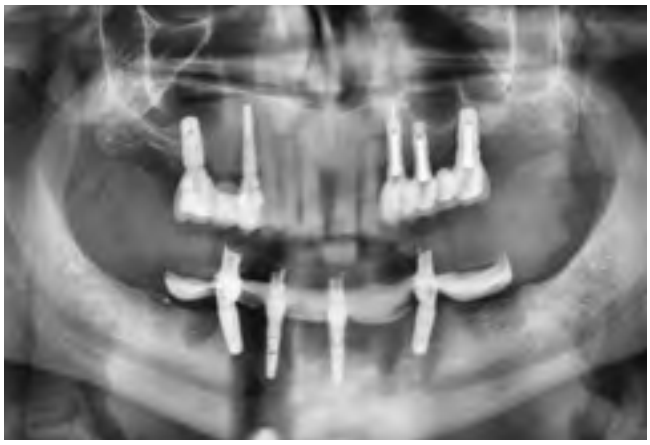
4 I Checking the impression template in centric occlusion.



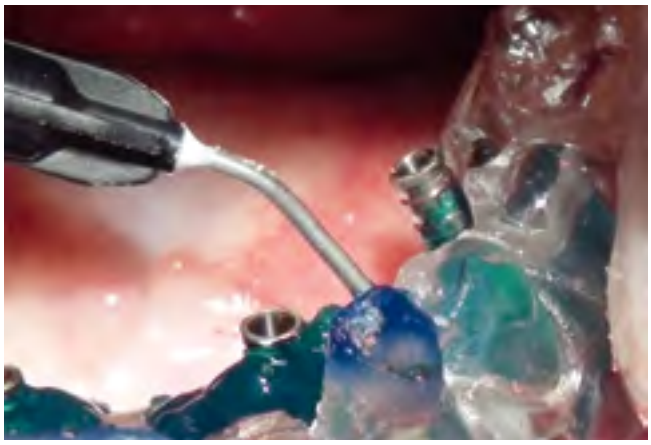
5 I Interior view of the prepared prosthesis with a whitish BioHPP framework and the three fixing clasps for repositioning on the master model.



6 I Vestibular view of the prepared prosthesis.



7 I Postoperative orthopantomograph with the prosthesis already in place.



8 I Reduced prosthetic coping to avoid disturbing the centric occlusion.

Protocol: laboratory makes the BioHPP prosthesis before the implant is placed

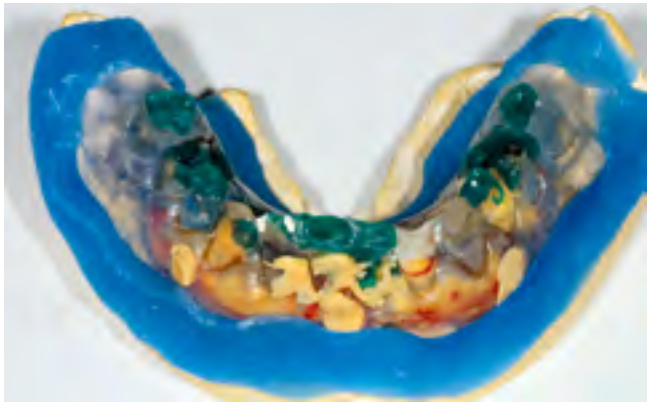
In a first step, the dental technician removes the teeth from the plaster cast to simulate the final situation in dental arch, then creates the prosthesis shape from casting wax to create a reference model for CAD/CAM milling of a BioHPP blank.

After machining the milling blank, the restoration is finished according to the wax-up using a hot-polymerizing resin (Dentaplast Optipress, bredent) into which the denture teeth (neo.lign, bredent) are integrated. Three brackets are attached to the prosthesis to create stable reference points on the master cast. All components are cured in a flask at 90 °C and 2.5 bar for 60 minutes (Figs. 5 and 6).

Surgical intervention: extraction and implantation

A surgical appointment was scheduled for the patient. Directly after local anaesthesia with mepivacaine (Septanest; Ogna, Muggiò, Italy) the remaining teeth were extracted. A mucoperiosteal flap was raised and the bone was levelled first. The implantation sites were accurately prepared as shown by the surgical template to ensure sufficient primary stability. Two axial and two angulated implants were placed and four abutments (SKY fast & fixed; bredent medical) were connected at a torque of 25 Ncm (Fig. 7). The flap was then sutured in place around the abutment.

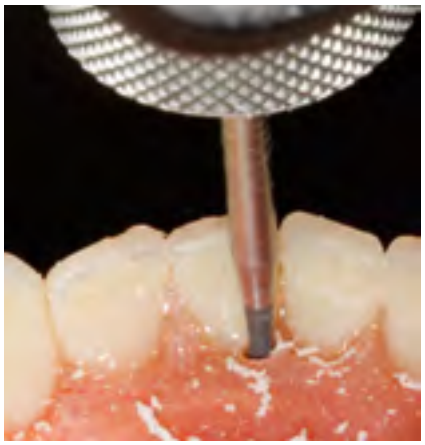
The prosthetic copings were placed on the abutments and fitted so as not to interfere with the centric occlusion (Fig. 8). The impression template was perforated at the exit point of the prosthetic copings so that the template could be positioned precisely, a point that requires special attention on the part of the clinician. The prosthetic copings were then joined to the template using a light-curing composite resin (compoForm; bredent), so that the impression template and prosthetic cap formed a stable unit. The centric occlusion was checked one more time. Subsequently, impression material was introduced with a mixing gun through the holes below the template until all gaps were completely closed. Finally, the caps were unscrewed and the template was removed from the mouth. The laboratory analogues were screwed onto the prosthetic copings. The master cast was perforated at the positions of the laboratory analogues and the impression was precisely repositioned (Fig. 9). The laboratory analogues were secured in place in the master cast (Fig. 10).



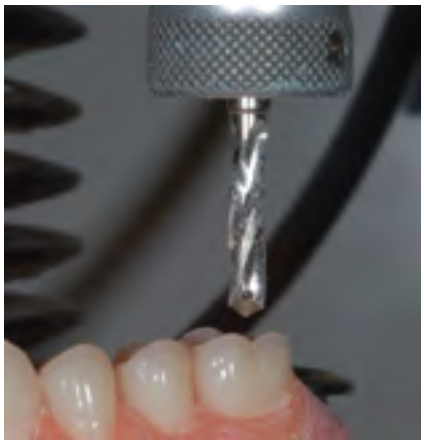
9 I Impression template positioned on the master model that had previously been trimmed (impression copings attached to the inside).

10 I Injection of liquid stone into notches milled in the stone cast.

11a I The master model under the milling unit. A reference marker records the position of the coping.

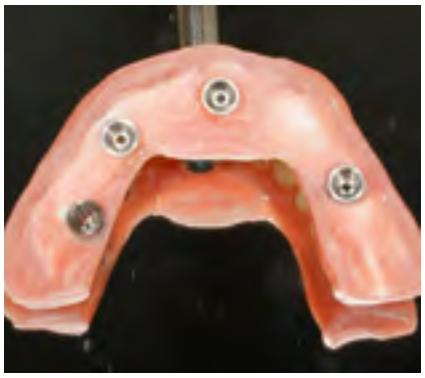


11b I Drilling the denture with a round bur.



11c I Calibrated drill before drilling the BioHPP framework.

The prosthesis, which had already been fabricated by the laboratory, was positioned on the model and secured using the brackets. The brackets allow the bridge to be seated in a slightly elevated position on the cast, out of contact with the laboratory analogues. The cast was then placed under a milling unit. The copings removed from the impression template were once again placed on the analogues. Once the first coping had been screwed onto the first analogue, its exact position and inclination were recorded on the milling unit using a reference marker (Fig. 11a). The coping was removed and the prosthesis returnes to master cast, where holes were drilled, first with a small-diameter round bur (Fig. 11b) and then with a drill calibrated to the diameter of the cap (Fig. 11c). The same procedure was repeated for the other copings. In the next step, the copings were attached using an anaerobic adhesive (DTK adhesive; bredent). The denture was relined and polished (Fig. 12).

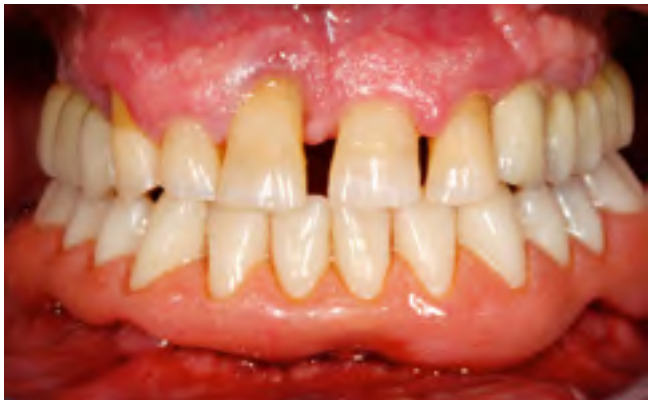


12 I The finished and polished copings attached to the prosthesis (intaglio side).

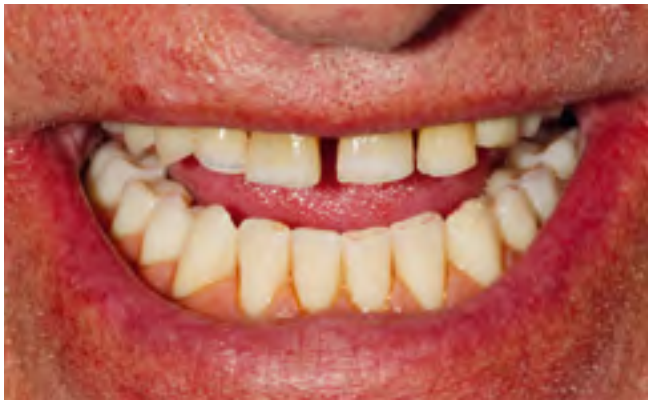
Four hours after surgery, the restoration was placed on the implants (Figs. 13 and 14) and the occlusion was checked. The implants were checked and the prosthesis relined after four months. The orthopantomograph at two years showed a stable implant situation and good healing of the previous bone defects (Fig. 15). The peri-implant tissue was stable and in good condition (Figs. 16 and 17).

Conclusion

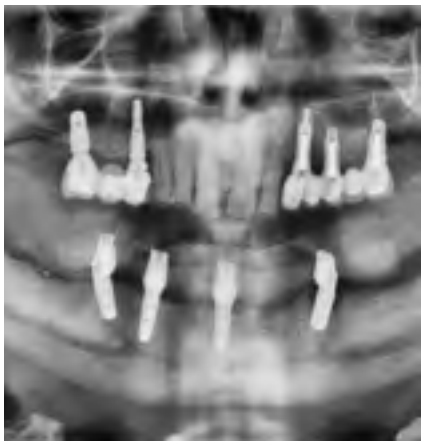
The aim of this case study is to propose a new protocol for restoring the entire dental arch using immediate implants. To date, no prosthetic protocol has been published that could be accepted as the gold standard for immediate loading. Prerequisites for success – and about this there is general agreement – include achieving sufficient primary stability and avoiding micro-movements of the implants by passively fitting and rigid restorations. The fabrication and delivery of a prosthesis with these properties often requires at least 24 or 48 hours of work in the laboratory. In some cases,



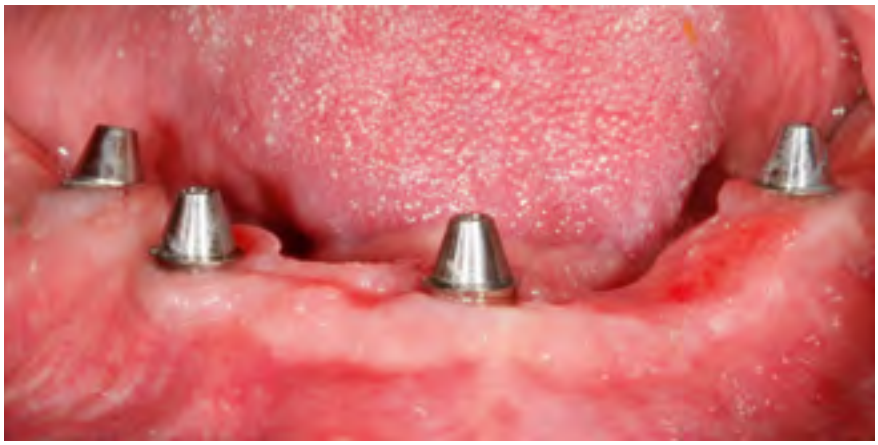
13 I Prosthesis screw-connected to the implants.



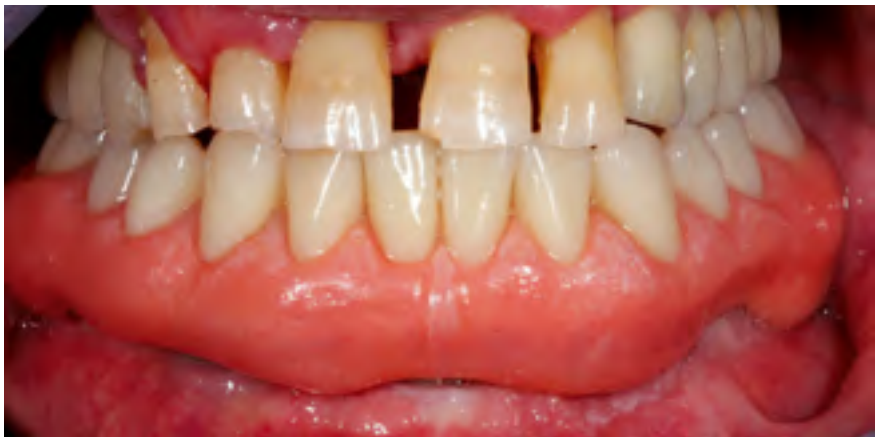
14 I The patient's smile.



15 I Orthopantomograph at two years.



16 I With the prosthesis removed, the soft-tissue is exposed.



17 I The prosthesis in situ at two years.

patients will be unwilling to accept this and refuse implant treatment. In our experience, most people who underwent immediate loading treatment still had some residual teeth and refused to wear a removable provisional prosthesis. Our efforts were therefore directed towards the development (production) of a stable restoration in a modicum of time.

The protocol proposed in the present article is based on two key factors. The first factor is the adoption of the "one-cast technique" for transferring information from the patient's mouth to the dental laboratory. In fact, all impression-taking and bite registration techniques are influenced by variables that must be checked before the prosthesis is produced. This could lead to an increase in working hours and delay the delivery of the prosthesis to the patient.

The use of an impression template used to constantly monitor conformity when working with the articulator offers two advantages. The first advantage is that materials with a very high degree of accuracy (close to 100 %) can be used to attach the prosthetic copings to the template. Using these devices instead of a conventional transfer impression is made even more attractive by the possibility of modifying the height of the copings, avoiding malocclusions. The second advantage is that, once the template has been attached to the copings and the centric occlusion has been adjusted correctly, the situation can be transferred to the articulator without any loss of information or precision. If the dental technician can complete the prosthesis without corrections, it can be realized within a shorter time. It is important to create some reference markers to ensure precise repositioning of the impression on the master cast in order for the laboratory analogues to be exactly placed in their correct position in the cast.

The second key factor is the use of a high-performance polymer of the new generation, for example BioHPP. Its low specific mass (almost 20 times less than titanium) and its high loading capacity (almost 1,200 N) make this material extremely attractive for the immediate loading protocol. The stability and aesthetics that can be achieved with BioHPP allow the finished restoration to be almost identical to a definitive prosthesis.

When fabricating a full-arch bridge prior to implant placement, the previously planned working time must be taken into account. Unlike with a metal framework, holes can be drilled in BioHPP and the material relined, so it can be used for immediate restoration on the same day. Further studies and clinical case studies are required to confirm that the protocol described above is generally suitable for immediate loading procedures. The authors are currently treating other patients using the same procedure and will report on the results in further publications. ■

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

Contact address

Dr Giovanni Ghirlanda
Corso d'Italia, 92
00198 Rome
Italy
g_ghirlanda@hotmail.com

Counter-torque technique for a minimally invasive, predictable and successful procedure

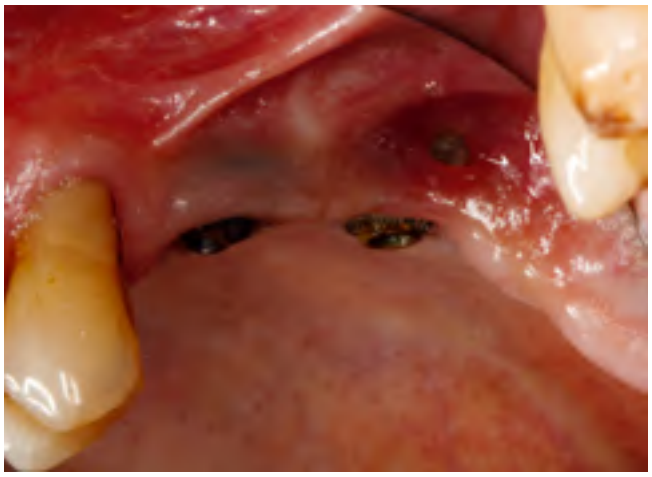
Atraumatic removal of zygomatic implants

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

Zygomatic implants have been an effective option in the management of the atrophic maxilla. These implants were introduced by Brånemark in 1998 for dental rehabilitation and to obtain posterior maxillary anchorage for facial prostheses [1]. They are long implants (30 to 50 mm long) that are anchored in the zygomatic bone and emerging from the oral cavity with a 45-degree angled head and require training [2,3]. Several systematic reviews have evaluated outcomes of zygomatic implant treatment. The results indicate a high level of predictability of this technique (95.21 %) [4]. Reported complications with zygomatic implants are maxillary sinusitis (the most frequent complication), oroantral communication, implant failure, neurosensory disturbances and speech difficulties [5].

Most of the studies reviewed cite sinusitis as the most frequent complication, with an average prevalence of 3.9 zygomatic implants out of every 100 placed [3]. The failure of non-mobile zygomatic implants or the presence of a symptomatic oroantral communication would be a challenging situation. In one study, the surgical removal of zygomatic dental implants has resulted in a significant loss of bone [6]. Only one article described the successful use of a counter-torque technique [7].

The counter-torque technique was conceived to remove non-mobile implants affected by peri-implantitis or technical complications. Since then, the counter-torque technique for implant removal has become established as a predictable and successful technique. The purpose of this case report is to present the minimally invasive removal of non-mobile zygomatic implants.



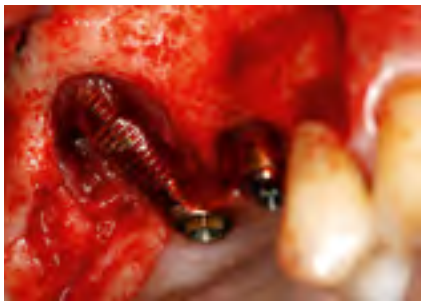
1 I Initial photograph showing the peri-implantitis in the zygomatic implant with a fistula in the buccal mucosa.

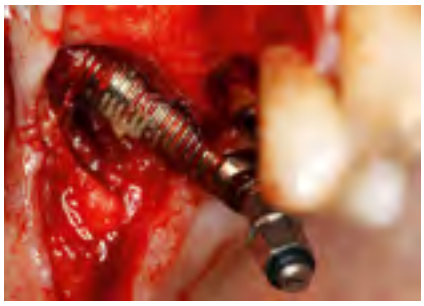
Case report

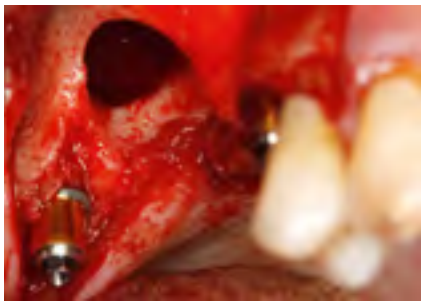
A 62-year-old male patient presented at our clinic with a complaint of unusual taste sensations and reported several episodes of inflammation in the upper right side of the mouth.

The general medical history was non-contributory. The dental history indicated the presence of an implant-supported restoration in the maxilla. Clinical examination revealed the presence of a hybrid prosthesis supported by two implants at sites 15 and 16. Implant 16 was a zygomatic implant. A cone-beam computed tomography (CBCT) scan indicated the presence of sinusitis affecting the right maxillary sinus and an oroantral communication. The patient had repeatedly been placed on antibiotic therapy for his chronic sinusitis over a year at another clinical centre.

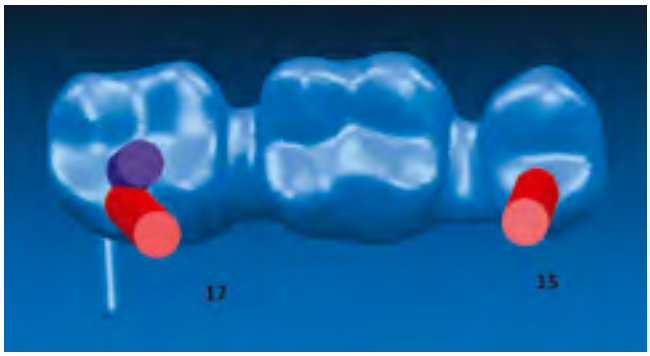
[1] Private practice in oral implantology, Eduardo Anitua Foundation, Vitoria, Spain
[2] Clinical researcher, Eduardo Anitua Foundation, Vitoria, Spain



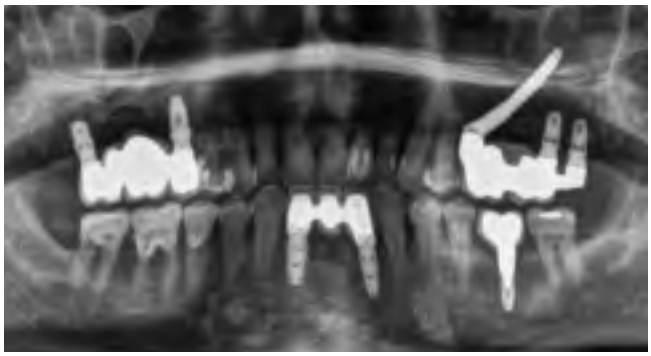




2 I Clinical photograph showing the presence of crater-like bone defect and the presence of granulation tissue. At this point, the extraction of the implant was performed. The first step was the insertion of the extractor into the implant connection to transmit the counter-torque force to the implant. 3 I The extracted zygomatic implant. 4 I The post-extraction defect.



5 I CAD/CAM design of the new prosthesis.



6 I The definitive implant-supported prosthesis after six months of surgery.

After removing the prosthesis, we observed the presence of a mucosal fenestration exposing part of the zygomatic implant, inflamed peri-implant mucosa with pus discharge and deep pockets (Fig. 1). This implant was diagnosed as being affected by peri-implantitis. A treatment plan was proposed that included the removal of the dental implants and the granulation tissue within the maxillary sinus.

A crestal incision was performed to elevate a full-thickness flap and expose the surgical site. This permitted the observation of a crater-like bone defect and granulation tissue around the implant. Plaque-like deposits were also evident on the implant surface (Fig. 2). Implant explantation was carried out using an implant extraction kit (BTI Biotechnology Institute, Vitoria, Spain). An extractor engaged the implant connection, with removal torque exerted by a wrench in a counterclockwise direction, maintaining a perpendicular position of the assembly in relation to the implant platform (Fig. 3). After implant removal (Fig. 4), the explantation socket was carefully curetted to remove any granulation tissue, and the sinus tissue granulation was cleaned. A new implant was placed at site 17. Transepithelial abutments (Multi-Im; BTI Biotechnology Institute) were connected to the new implant. The Nobel Biocare implant 15 was connected to a compatible transepithelial abutment (BTI Biotechnology Institute). The provisional prosthesis was connected to the implants at the next surgical appointment, and the final prosthesis was delivered six months later (Figs. 5 and 6).

Discussion

Different methods for removing osseointegrated implants have been described. Some of them include trephining a bone block containing the implant and the use of a thin bur at low speed with irrigation to separate the implant from the surrounding bone. These methods have the disadvantage of being highly traumatic and have not been successfully used for removing zygomatic implants [9]. In this case report, the use of a predictable removal kit has allowed the removal of the implant without damage to the remaining bone. This would emphasize the importance of preserving the available bone tissue when removing failed zygomatic implants. The cases treated with zygomatic implants involve severe bone resorption; the preservation of the total of bone around the post-extraction socket in this particular case made a new predictable re-treatment possible.

Conclusion

The technique described is a minimally invasive alternative for the removal of failed zygomatic dental implants with a possibility of renewed implant treatment in the residual crestal 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
Spain
eduardoanitua@eduardoanitua.com

Dentsply Sirona World 2018

A must-attend educational event

What is the difference between a dental event and a must-attend dental event? At the end of September, Dentsply Sirona gave the answer with the company's Ultimate Dental World Meeting 2018 in Orlando, Florida, USA: the perfect combination of high-quality educational opportunities, the presentation of cutting-edge technologies and products, and an unmatched entertainment programme.

Dentsply Sirona CEO *Don Casey* summed it up in his welcome address: The Dentsply Sirona family meets in Orlando to show how they want to change dentistry in the future. But also to jointly celebrate the successes they have achieved so far. And he was impressed how enthusiastic dental practitioners are about their profession. "Their commitment to patients and their dental health is inspirational and unparalleled compared to other industries", *Casey* said.

During the following three days, continuing educational courses were offered in twelve specialized tracks, a record for the event. Attendees had a vast choice of sophisticated learning opportunities and could personalize their schedules to meet their needs. The General Sessions fascinated and motivated the audience with inspiring speakers and a live dental procedure.

The introduction of Azento, an integrated, tailor-made implant solution for single tooth replacement, turned out to be a highlight of the new products and procedures that were presented in Orlando. Azento is a streamlined custom implant solution, enabling excellent results for patients and practice. Via an intuitive web portal and a streamlined workflow, dental practices can offer an optimized patient experience while enjoying more working efficiency. The Azento box contains everything the practitioner needs to carry out a successful, less stressful implant procedure: a surgical guide and all necessary instruments and drills; an optimal implant and Atlantis custom healing abutment; and optionally an Atlantis temporary restoration. Each patient receives a precise, custom treatment plan recommendation based on their CBCT and intraoral scanning images. Azento is available in the USA since September and will be launched in Europe in 2019.

Pulitzer Prize-winning and bestseller author *Doris Kearns Goodwin* as a keynote speaker, comedian *Jim Gaffigan* and pop superstar *Katy Perry* with their celebrated performances completed the sophisticated congress programme, with the Oktoberfest gathering as the grand finale of amazing three days in Orlando. The next Dentsply Sirona World event is scheduled for 3 to 5 October 2019 in the Mandalay Bay Hotel in Las Vegas. *RED*

CEO Don Casey took the stage to welcome the more than 4,000 attendees.

Interview with Maureen MacInnis, Senior Vice President, Chief HR Officer & Communications at Dentsply Sirona

Women in dentistry: a macrotrend

Dentsply Sirona recognizes the need to support and develop female colleagues and to provide opportunities for personal and professional growth. The Women Inspired Network (WIN) programme, for instance, is a critical leadership development tool helping to accelerate female career development within the company. EDI Journal Project Manager My To talked to Maureen MacInnis, Senior Vice President, Chief Human Resources Officer and Communications at Dentsply Sirona, about women in the dental world.

In more and more countries, the number of practicing female dentists exceeds that of their male counterparts. How do you explain this trend?

It absolutely is a global macrotrend. We know that in Europe it will be over 50 per cent by 2020 and we also see it happening in the United States and everywhere else in the world. Indonesia has over 70 per cent of female dentists! What we are noticing is that this trend is important to what is happening to dentistry around the world. From my perspective, it is important for how we think about our products and how we serve our customers.

Does Dentsply Sirona see a need to respond to this development?

We absolutely see a need because these women are customers. We think about it in our R&D, in how we set up our training programmes, in our networking for dentists. For example, if we think about training for the clinical education of dentists, it's important that we consider the needs of female dentists as well. We continue to evolve in that. And there is a couple of special needs that female practitioners have anatomically. In general, the hands of women are smaller, so the instruments have to have different proportions, which we factor into the R&D for our products.

You are responsible for HR and Communications. Will the said trend in dentistry also find its way into the economic and technical areas of the dental industry?

Definitely. Just look at all the advancements that we have already made. We have two very experienced female board members, *Betsy Holden* and *Leslie Faron*. And as I look across our organization, we have significant female representation across all of our segments, products and commercial organizations but also in R&D, in quality and regulatory, as well as in the clinical sector.

Personally spoken, HR gives me the chance to advance talent, to move people's careers ahead. You can have a lot of products, but you need the people to move it. So when I look across our leadership, the female leaders within Dentsply Sirona are phenomenal; it inspires me. We have put programmes together to support the development in leadership, and they are also customized to women. We started a programme in 2016, Women Inspired Network, which brings together women and develops their leadership skills. But the key of that programme is the networking part, the possibility to meet women from all around the world who are passionate about dentistry.

Another aspect of women's leadership that I am extremely proud of is our EPIC programme (Educate, Practice, Innovate, Connect) that focuses on our customers. Last August, we invited female dental practitioners for clinical breakout sessions, organizational and product insights, networking and a keynote by a best-selling female author and entrepreneur.

No question that there is a lot more to do – and I am happy to be able to participate in that development and to offer support.

You have gained insight into other industries throughout your career. What distinguishes the dental sector from other industries and what do you particularly like about it?

I am in my tenth year and when I first came here, I was really impressed with the innovation and the way our employees think about improving dentistry every day. There is a lot of passion and commitment in dentistry all around the world. If you work at

Maureen MacInnis

Dentsply Sirona, you have joined a company that is committed to defining clinical procedures and outcomes. As a result, you have the opportunity to define procedures and outcomes globally, to set a global footprint. It is the ability to improve people's oral health worldwide which inspires me. And to work with the world's leading manufacturer of dental products and technologies with a strong history of improving oral health around the world.

While selecting people for a job, where do you see the differences between men and women in terms of the career path they choose, the way they bring family and career together?

Historically, there was this view that as a woman, you could not have a family and a career at the same time. But you absolutely can. I happen to have four children and I have worked my whole life. I was always able to pursue my career aspirations in balance with my family. And I absolutely think if people put their family first, they become very focused at their work. The exciting thing today is that males are also contributing to family life more and more. That is due to virtual work, to all the different levels of technology, where you work, what time you work, all over the world. Technology is a great levelling factor and I find that people are allowed to get a little more balance with what they choose to define as their family and their career.

What would you recommend your "younger self" at the beginning of her career?

My advice: Whatever it is that you aspire to do, excell at it, and continue your education. Learn as much as you can, constantly strive to be your best self, and that happens through learning and education. You don't only learn from senior persons, learning is all around you. Constantly stretch yourself, find challenging situations and learn.

Thanks a lot for this very inspiring interview, Ms MacInnis. *MT*

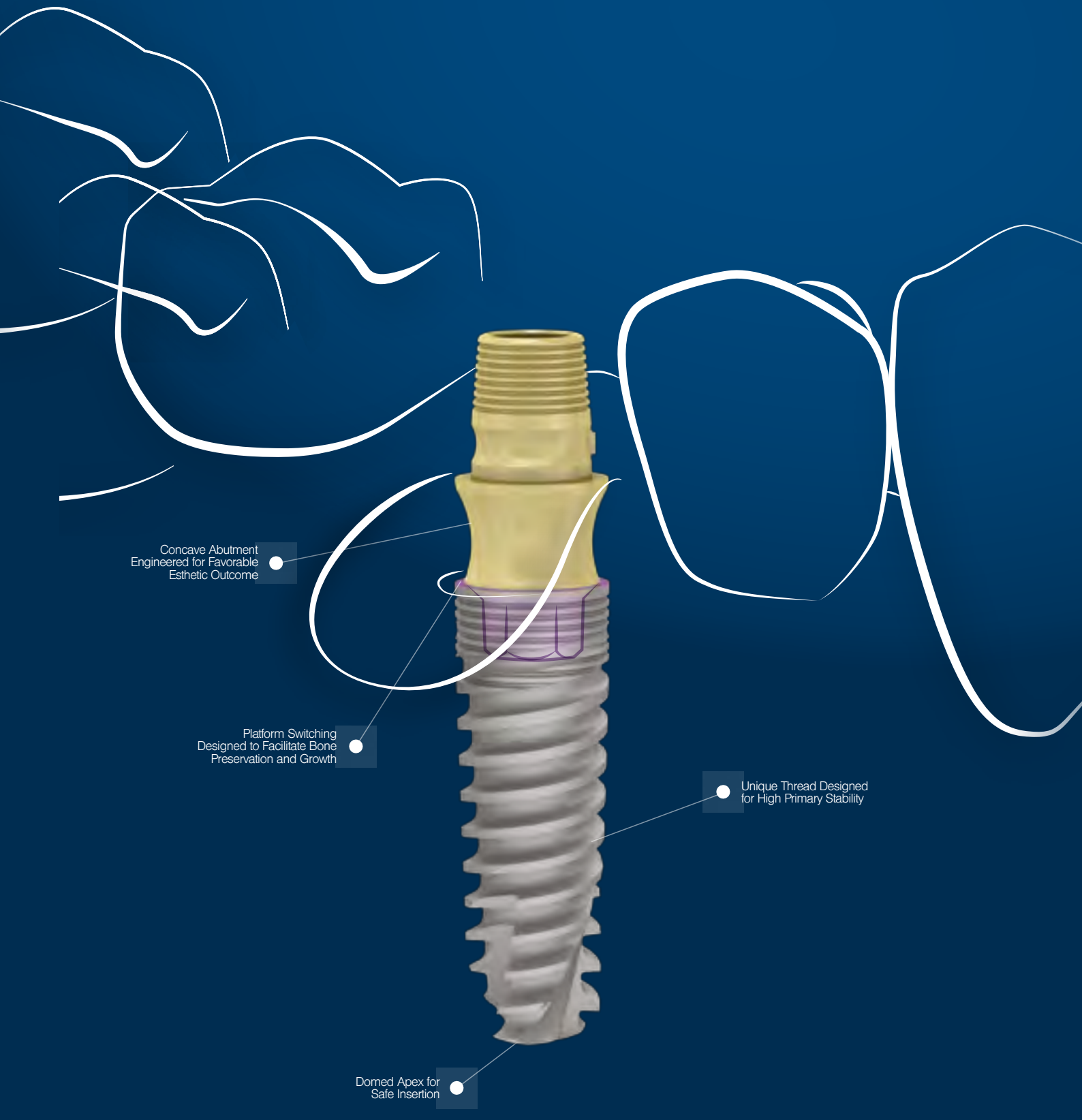
A new face for new impulses

Terhi Nyyssönen MSc has been appointed as the Chief Information Officer (CIO) of Planmeca Group. The new position aims to strengthen the development and management of IT, business applications and digital solutions in all Planmeca Group companies.

Terhi Nyyssönen has solid experience in various ICT leadership positions and several years of experience working as a CIO in large international manufacturing and wholesale corporations. With her strong expertise, *Ms Nyyssönen* brings important insight into digitalization to the Planmeca Group management team. The new CIO will report to Planmeca Group's Senior Vice President *Tuomas Lokki*.

"I'm delighted to have *Ms Nyyssönen* on board. Her appointment will further help us meet the increasing market demand for new and innovative digital technologies that will also create business value to our dealers, business partners and customers", states *Tuomas Lokki*, Senior Vice President of Planmeca Group.

More information
www.planmeca.com



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Expert opinions on peri-implantitis

A chronic issue in implant dentistry

Peri-implant diseases remain a dominant topic in implant dentistry, as was demonstrated once again at this year's congress of the European Association for Osseointegration (EAO) in Vienna, where many high-ranking speakers discussed this very complex issue. EDI Journal Project Manager My To seized the opportunity and elicited professional perspectives on the problem.

Statement by Professor Frank Schwarz

Professor Frank Schwarz

Professor Frank Schwarz, Head of the Department of Oral Surgery and Implantology at the Centre for Dentistry and Oral Medicine (Carolinum), Johann Wolfgang Goethe University Frankfurt (Germany), and President of the German Association of Oral Implantology (DGI), represents the perspective of prevention when the placement of an implant has proven to be unavoidable.

"The World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions in 2017 focused on prevention and risk factors. It turned out that we had to question some risk factors, such as smoking, due to an inconclusive level of evidence. Traditional medical thinking does not like to dismiss smoking as a risk factor, but for peri-implantitis, smoking is not an obvious factor. One topic now associated with a very high odds ratio is chronic periodontal disease. Patients with periodontitis are the group with the risk. If you exclude this risk – which does not mean not placing implants! – but carry out an appropriate pre-treatment, you have already taken a very big step towards prevention.

Unfortunately, the reality is that these patients still uncritically receive implant treatment, without considering their periodontal status. We must ensure that the bacterial load in the oral cavity has been reduced before implant placement. It is not possible to do this reliably afterwards, during the implant healing phase, which means that the foundation for future peri-implant disease will already have been laid. If complications occur later, both the patient and the practitioner will be affected. It is important to put both interested parties in charge to achieve a successful outcome. Practitioners cannot be blamed for patients' risk factors, but they can be blamed for not recognizing them. To avoid peri-implantitis, comprehensive and successful periodontal pre-treatment is a vital prerequisite."

Statement by Professor Andrea Mombelli

Professor Andrea Mombelli, Director of the Division of Periodontology at the University Clinics of Dental Medicine of the University of Geneva (Switzerland), comments on best practice in treatment of peri-implantitis and on the use of antibiotics.

"We know that the accumulation of bacterial deposits on implants induces inflammation. Inflammation is not yet peri-implantitis, but it is the beginning of a process that can lead to bone loss. If we can stop it, we will in most cases be able to

prevent peri-implant diseases. We also know that the inflammation disappears if we remove the bacterial deposits that convert the implant into a foreign body. Thus, the essence in the treatment of peri-implant diseases is the removal of bacterial biofilm. As long as you are dealing with mucositis, the issue is presence of biofilm on smooth surfaces that are easy to clean – you will not need antibiotics to accomplish this. If the pocket is no deeper than 5 mm, mechanical procedures, for example using carbon curettes or air-polishing devices, will usually remove the biofilm predictably. However, if pockets are deeper than 5 mm, you will enter an area on the implant that exhibits micro and macro rugosities and threads, which make it more difficult to remove bacterial deposits completely. From a certain point on, you need to gain access by reflecting a flap to meticulously decontaminate the rough implant surfaces. This surgical approach will also allow you to remove the granulation tissue from the defect. When we do these surgical procedures, we routinely give patients antibiotics. Based on the studies we have performed it is normally a combination of metronidazole and amoxicillin. Although you cannot guarantee total success of peri-implant therapy based on current evidence, you should always try to do your best to suppress the bacteria causing the problem, which means that the use of antibiotics is advisable."

Professor Andrea Mombelli

Statement by Professor Niklaus Lang

Professor Niklaus Lang, Professor of Implant Dentistry at the University of Hong Kong and Professor Emeritus of the University of Bern (Switzerland), describes the "Five pillars of tooth preservation" that could help reduce the need for implant placement and the associated risk of peri-implant disease in the first place.

"In order to reduce peri-implant diseases, a fundamental paradigm shift in treatment planning and treatment philosophy must take place. It is based on five pillars. The first change needed is that patients should not receive implants before their oral health has been completely restored. All teeth should be periodontally and endodontically treated before any implants can be placed at all. And it means that implants are only placed where teeth are missing, not to replace existing teeth.

The second pillar is that patients must 'earn' their implants: they must deliver on oral hygiene. No implant should be placed until the patient has gone through a successful hygiene phase.

The third pillar is the absence of bleeding on probing or at least very low BoP values, probably not above 10 per cent. This can usually be achieved if plaque is reduced to about 20 per cent or less. The plaque index must be so low that the threshold for infection is not reached and the host response can cope with the deposits.

The fourth pillar is the design of the prosthetic restoration. It must be designed without inaccessible aspects where deposits could accumulate, and it must be amenable to easy cleaning. This is the responsibility of the implant dentist and the prosthodontist.

The fifth and final pillar is the fact that implants cannot be regarded as a one-off affair. They must be embedded in a system of maintenance care, which means a continuous diagnostic effort in terms of BoP. It is important that the implant dentist and the prosthodontist acknowledge that the placement and prosthetic restoration of an implant is not an end but a beginning, the beginning of the implant's useful life. If any signs of disease appear, it is important to treat it if still reversible, that is, at the mucositis stage. In other words: Implant patients need close monitoring. Implant dentists should employ their own dental hygienists or collaborate with periodontists. Basically, this is part of every implant treatment. Why is it called 'supportive periodontal therapy'? Because you support the efforts of the patient to keep his or her implants clean.

I am convinced that the prevalence of peri-implantitis would drop dramatically if these factors were consistently taken into account."

Professor Niklaus Lang

Interview with Hans Geiselhöringer, President of Nobel Biocare

"Like no other"

Some 4,000 guests gathered at the EAO congress in Vienna to learn about the latest findings in implantology, surgery and prosthetics. As a Diamond Sponsor, Nobel Biocare offered a top-class corporate forum, rewarding hands-on workshops and well-attended presentations at their exhibition stand. The perfectly equipped hospitality lounge also attracted many visitors who collected first-hand information about Nobel Biocare's latest innovations. CEO Hans Geiselhöringer took the time to answer EDI Journal's questions about his company.

"Like no other" is the leitmotiv of Nobel's participation at the EAO – referring to the uniqueness of both the dental practitioner and the patient. Does Nobel Biocare also consider itself as unique?

We see ourselves clearly as innovation leaders, and in certain areas we are truly unique, for example in surface technology, in the number of implants in clinical trials, namely 110,000, in our 20 years of clinical experience with a surface that is undisputedly the best-documented surface in dental implantology today. Or look at our NobelPro implant line, which we have developed specifically to give edentulous patients the chance to receive a decent and minimally invasive restoration, that's also unique. And I have a unique team which I am very proud of.

Aesthetics, life-changing, digital solutions, longevity: How do you link Nobel's key objectives with each other and is there an order of significance?

Let's look at this from the patient's side. While 20 years ago a dental implant was successful when it was osseointegrated and had a prosthetic restoration, a patient today expects it to look completely natural. This means that soft tissue management is particularly important – and one of the focus areas of our innovations. The new Galvosurge ensures that the tissue around the implant remains healthy in the long term. For us, longevity also means to underpin the quality of our products with long-term clinical results and studies. It is extremely important to us that a patient who receives one of our products is happy with the implant and the aesthetics for a very long time. We want low complications and low follow-up costs for our patients – that is the objective of the research and innovation that we have been driving forward for years. "Life-changing" comes automatically; when you see how happy patients are with an implant restoration when they have been wearing prostheses for years, and how happy they can still be after ten or fifteen years, that is very satisfying. That's what Nobel Biocare and the team live for. But basically, of course, all these objectives are equally important.

All major players are trying to offer the complete range of products and services, yet with different strategies. Which strategy does Nobel pursue in this regard?

Our focus is the integration and simplification of the clinical workflow. And there are different ways to reach this. It depends on the gap you want to close in the workflow. There are certain things that we at Nobel Biocare can do outstandingly well, due to decades of experience, for example in the field of the restoration of edentulous jaws, or in surface technology. We are convinced that we have the core competence to fill the gaps here.

In other areas of technology, however, these core competencies can be better found outside. In these areas we strive for strategic partnerships. xNav is a good example. We make precise analyses and then decide what we can do inhouse and what we want to realize with a partner. These are not "flavour of the day decisions" and we do a lot of research to find the best partner. During the subseqent development process, we do numerous clinical tests to see if things work out the way we want them to, and only then we really launch the product on the market. We want to make sure that new technologies work properly within the workflow, that's why it is crucial that our clinical consultants give us sufficient feedback. This means that our advisors, our key experts, are involved from the very beginning. That is our strategy.

Thank you very much for the interesting interview, Mr Geiselhöringer. *IL*

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CURIOUS?
FIND OUT MORE:

SwissPerio Education Week 2018 successfully completed

Knowledge as pure as water

The month of November drew to a close with the success of one of the most intense and ambitious programmes that SwissPerio has organized during the first year of establishing itself as a solid educational project in the field of training in dentistry: the SwissPerio Education Week. A project that weeks later is still remembered with a certain feeling of nostalgia and satisfaction. It was a week of intense work and study but also one of friendship and camaraderie.

Manual dexterity and visual-spatial abilities are trained in exercises with blindfolded eyes.

SwissPerio originates from the perception that undergraduate education or postgraduate training are not enough to obtain true clinical expertise. SwissPerio promotes the improvement of standards in periodontal and implant practice not only through the development of domain knowledge, but also through factors such as skills, attitude and behaviour.

In this way, the SwissPerio Education Week fulfilled the expectations in every single aspect. The speakers were chosen one by one to cover, in the most precise and rigorous manner, the tools of periodontology from A to Z: from the anatomy of the periodontal tissues to diagnosis, diagnostics and non-surgical therapy – an unpopular but very important topic – to surgery. And all this from a genuine and innovative perspective. *Jan Lindhe*, *Sandro Cortellini*, *Niklaus P. Lang*, *Rino Burkhardt* and the rest of the speakers who participated during the week presented a very complete educational programme which included basic aspects such as "Periodontal charting and examination protocols" or "Structure and function of the periodontal tissues" as well as more complex, rarely treated topics like "Insight into molecular and cell biology of the oral mucosa" or "Theoretical aspects of mechanotransduction".

Three basic pillars

The contents proposed during those days were all related to the basic pillars of SwissPerio's philosophy: skilful hands, critical thinking and decision-making, and factual knowledge. In clinical practice, success ultimately depends on the precise and delicate execution of a given intervention that requires skilful hands, which is why training of manual dexterity and visual-spatial ability are key aspects in SwissPerio's hands-on courses.

Critical thinking and decision-making represent the second pillar that underlies all of SwissPerio's courses – the tools to link scientific evidence to the clinician's expertise, the patient's individual circumstances and the clinical context and settings. This is where psychology plays a role. Clinicians need factual and statistical knowledge to make decisions, but when the need arises to decide very quickly, for example during a surgical intervention, they also need intuition.

Finally, factual knowledge, the third pillar, is the bottommost level of competence and even here, one needs critical thinking to separate clinically relevant findings from the statistically significant ones in the so-called "evidence-based" literature.

The daily conferences were combined with extensive and personalized workshops: treatment planning with interesting discussions, advanced surgical techniques in periodontal plastic surgery as well as regenerative surgery using a microscope, surgical exercises designed to work on precision in apically repositioned flaps and distal wedge and periodontal pocket surgery, or sessions on periodontal debridement. All this with constant, direct interaction between the specialists and the participants.

The SwissPerio Education Week did nothing more than corroborate and reaffirm the architectonic principles of SwissPerio's project which, in little more than a year since it began, has already stood out for its high and innovative educational level in the field of dentistry – proved without a doubt by the positive feedback from the participants, their infinite interest and their passion for learning day after day. *EDI*

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Optimal periodontal conditions for successful implantation

No Yin without Yang

Photo: Anne Barfuß

Dialogue with the EFP President: Professor Anton Sculean (left) and Dr Karl-Ludwig Ackermann discuss when implantation can be successful in patients with a history of periodontitis.

How can peri-implant infections be avoided and treated as needed? In addition to the newly presented classifications, this issue was a key topic at EuroPerio held in Amsterdam in June. In a symposium organized by the Austrian dental company W&H, Dr Karl-Ludwig Ackermann (Filderstadt, Germany) presented his clinical concept based on the NIWOP workflow ("No Implantology without Periodontology").

Dr Karl-Ludwig Ackermann, a specialist in implantology and periodontology, has inserted many thousands of implants over almost 40 years. "Over time, you gather a wealth of experience and never stop honing your skills. Nowadays, I invest a lot more time and fight for each and every tooth. But if implants still prove necessary, I prepare my patients very carefully."

Ackermann started off by mentioning the current prevalence of periodontitis, which already affects more than half of the 35- to 44-year-olds and almost two thirds among the 65- to 74-year-olds in Germany. Untreated periodontitis patients have a significantly higher risk of peri-implant infections [1]. According to *Ackermann's* experience and based on the current literature, the risk is also higher if patients treated initially are not integrated in the requisite recall programme (supportive periodontal therapy, SPT) [2]. Patients with a history of periodontitis should be informed that without suitable aftercare, their implant prognosis is relatively unfavourable. In such cases, *Ackermann* speaks of ten years, whereas implants in patients who participate in a corresponding recall programme at his practice generally enjoy at least 20 years of implant success.

"Patients think that oral hygiene is no longer important when they have implants." With this in mind, *Ackermann*'s team explains the causes of gum disease to patients, instructs them extensively in proper oral hygiene and the care of implant-supported prostheses and performs professional teeth cleaning and polishing at regular intervals. Implants are not inserted in affected patients without prior periodontal treatment. The recall interval for the SPT is between two and six months, although there are no clinically supported recommendations available at present. One important criterion is the efficiency of oral hygiene by the patient. "Manual dexterity usually decreases with advancing age, which means that a personal, closely monitored aftercare including treatment tailored to the patient's age often becomes necessary." *Ackermann* drew on a number of patient examples to illustrate his staged treatment concept which allows him to achieve long-time stable implant-prosthetic results – assuming good compliance on part of the patient. If peri-implantitis develops despite all efforts, *Ackermann* prefers to remove the affected implants at an early stage depending on the defect morphology: "Implant restorations may look like natural teeth, but they behave differently." In his experience, it is in general not possible to decontaminate the relatively rough implant surfaces successfully and achieve long-term tissue stability – an issue particularly important in the aesthetic field.

During the ensuing discussion, led by EFP President *Professor Anton Sculean* (Bern, Switzerland), the question arose of when teeth should be extracted and replaced with implants – a question not easy to answer according to *Ackermann*. There is no algorithm available for it. Instead, pronounced mobility (grade 3) is decisive; he does not consider probing depths to be a reliable criterion. *Sculean* added that a 20-year-old patient with little plaque and ten or more deep pockets would have to be treated differently from a 40-year-old patient with extensive plaque and calculus but only a few deep pockets.

Ackermann's belief is that patients with a history of periodontitis or current infection experience peri-implant problems in most of the cases. "The same is true of edentulous patients. We still do not know exactly which genetic mechanisms lead to periodontally-induced tooth losses"– another hotly discussed topic at EuroPerio.

Dr Jan H. Koch, Freising, Germany

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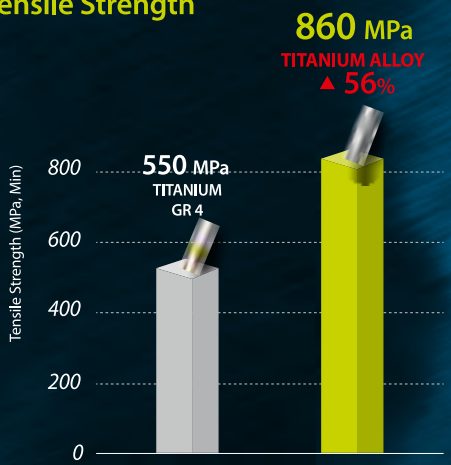

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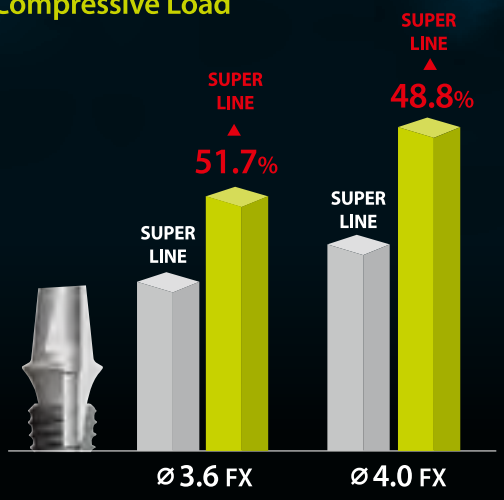
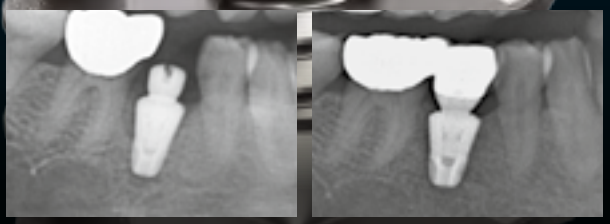


Long-Term Case



06.20.2007
Post-Op

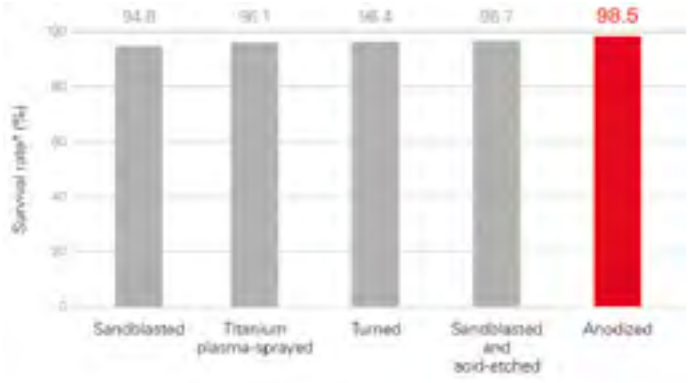
04.28.2017
Follow up - 9 years 4 months

Comparison of long-term survival rates of different moderately rough implant surfaces

Surface matters!

In a newly published study comparing five implant surfaces, the Nobel Biocare TiUnite surface has come out on top. A world-leading authority in dental implant surfaces, Professor Ann Wennerberg has led a systematic review of 62 clinical studies, analyzing a total of over 17,000 implants* with at least ten years' follow-up. The study compares the long-term clinical outcome of treatment with different surfaces. During the EAO Congress in Vienna, Austria, Professor Wennerberg shared her insights with the attendees and answered the questions of EDI Journal.

It is one of the most scrutinized dental implant surface on the market, and long-term success with TiUnite surface implants is made evident yet again. In a newly published study comparing five implant surfaces, TiUnite takes the first place [1].



† The survival rate is calculated from failure rate. Statistical analyses were performed on failure rate (systematic review of studies with 10 or more years in function).

Table 1 I Survival rate of different implant surfaces.

For improved osseointegration, implant design and implant surfaces have been continuously changing for many years: from turned and titanium plasma-sprayed surfaces in the 1980s, to blasted, etched and anodized, and more, in the 1990s and 2000s. The anodized TiUnite surface showed a significantly higher survival rate than other surfaces, at 98.5 per cent ($p < 0.05$).

Comparing sandblasted and acid-etched implants versus turned implants, there was no significant difference in survival; 96.7 per cent and 96.4 per cent respectively (see Table 1).

These results from long-term studies are consistent with previous findings showing anodized surfaces are associated with a high probability of implant survival and predictable long-term outcomes [2]. ■

* Anodized (1,095), blasted (1,803), TPS (2,765), turned (11,236), sandblasted/ and acid-etched (938) surface implants

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

Interview with Professor Ann Wennerberg

Professor Wennerberg, could you give us a short summary of the speech that you just delivered here at EAO?

My talk concentrated on two rather newly published studies. One compared the traditional machined surfaces of Nobel Biocare with the TiUnite surface, and it turned out in clinical studies that there was a much higher survival rate and a much lower probability of implant loss if the surface was anodized.

The second part of my presentation was dedicated to a newly published systematic review consisting of 62 different papers where we investigatede the clinical outcome when implants have been placed for more than ten years – a long-term follow-up. We compared the results of the studies with regard to

the reported implant loss and marginal bone loss, and it showed that of all moderately rough surfaces that dominate the market today – sandblasted, titanium plasma-sprayed, turned, sandblasted and acid-etched as well as anodized — the latter again porved to have the least probability of failure.

You encourage practitioners to choose a well-documented system. How can they make sure that their system is really well-documented?

The easiest thing is to ask the manufacturer or the distributor of the implant system which you are interested in to provide all available material to see if there is any documentation at all. If there is a record of five years of documentation with success rates or survival rates of let's say about 95 per cent or more, then you know that it seems to be quite safe. This is of rising importance because there are so many copycats today that you might not always know what you are buying. On the other hand, it is much easier nowadays to get information than it was before, but you still have to ask for it and you also need some knowledge of the topic to be able to evaluate the information you get.

A personal question: You started your professional life as a prosthodontist. Where does your interest in implant surfaces stem from?

I was a private clinician for ten years and then I was longing back to academic life. I got in contact with *Professor Tomas Albrektsson*, who offered me a project related to implant surfaces. At that time, I had no idea about the topic, yet it turned out to be a rather long journey to find measuring techniques that were suitable for the evaluation of different surfaces before we could proceed to experimental studies. So that was the beginning of my PhD project in the early 1990s, and ever since I have been hooked on the topic.

Thank you very much for your time and the interview, Professor Wennerberg. *IL*

Professor Ann Wennerberg during the EAO Annual Scientific Meeting 2018 in Vienna.

Interview with Assoc. Professor Ulrike Kuchler, Medical University of Vienna, Department of Oral Surgery

Confidence and predictability

Assoc. Professor Ulrike Kuchler was one of the speakers at the Osstell Industry Satellite Symposium at the EAO in Vienna at the beginning of October. In her speech, she focussed on implant stability in compromised situations. Kuchler explicitly described the main factors that lead to implant stability and substantiated her statements with numerous studies. After the speech, EDI Journal Project Manager My To asked Professor Kuchler some in-depth questions.

Are there any indications which suggest a systematical use of ISQ measuring?

I see absolute advantages in regular screening, especially in complex cases such as patients with low bone quality. The measurement of the ISQ value gives me a higher certainty for a successful outcome and what is more, the communication with patients and colleagues is much easier when it is based on verifiable data.

Could the Osstell instrument be used to justify the choice of the right point in time to load an implant?

Considering that the trend is increasingly moving towards immediate placement and immediate loading, meaning that the time between extraction and implant placement respectively between placement and loading is getting shorter and shorter, the ISQ measurement is an ideal tool for putting neither yourself nor the patient nor the referring physician ››

at risk. If something goes wrong, everyone involved suffers. Apart from the patient's pain, this also includes the high costs incurred in such cases.

In your opinion, is the ISQ value itself decisive or the development of the value? Can you recognize the "bungee dip" by measuring several times in a row or is the absolute value decisive to decide when loading is possible?

The development shows in which direction implant stability goes. For example, in one of the studies I quoted in my presentation, we had patients who for 18 weeks simply did not reach a value of 70, a value that stands for high stability on the ISQ scale. And we also see that in our practices. There are patients who display a certain implant stability and stay with it for a relatively long time, and then you have to decide whether to load the implant or not. And we see good successes here. But it is important to notice whether an implant suddenly disintegrates and shows declining values. At this point, things become dangerous. If an implant has a relatively low but consistent stability, this is less severe than an implant with higher values that drop either dramatically or over time.

In your lecture you also talked about bone-to-implant contact. Is it conceivable that the ISQ value could be used for the evaluation of bone quality?

In one of the studies I presented, we see a connection between implant stability and marginal bone loss. However, to measure the bone volume on the basis of implant stability or to draw conclusions about possible bone loss, is not the issue. What is important to me in practice, is the final result: the x-ray and the implant stability value. These are the values that allow me to determine the bone situation at the time of the prosthetic restoration.

One must not forget, and this is very important, that over the long term there will always be bone remodelling. We do not know how the implant stability changes when an implant is loaded, whether there is an increase or a decrease. That is a factor which must also be taken into account.

Which core message should the audience take home from your lecture?

Measuring implant stability has many advantages for clinicians: not only in terms of success, but also in terms of patient confidence – not only in complex situations.

I have already pointed out the communication factor. Patients recognize that the dentist does everything possible to speed up the treatment time without putting the implant at risk. If an implant fails, the first question is always, "How could we have prevented this? How did the dentist make sure that it was the right time to load?" It is extremely helpful for mutual understanding if one can prove that an implant loss could not have been foreseen.

Another advantage is the increasing trend to shorten implant protocols. If, for example, you have a patient who says that he needs his implant at a certain date because a family or business affair is coming up or he is going abroad or something similar and I see that the value is stable, we can go for the prosthetic restoration after a short healing period.

But if the values are not suitable, then you know that it is not yet possible to treat the patient. Of course, I understand that patients prefer shorter protocols. Many ask for immediate implant loading but not every patient is suitable. So the measurement can give us a proof of the shortest possible healing time. I also see that patients are willing to invest the time for regular ISQ measurements because it gives them confidence.

What is particularly pleasant for me is that the ISQ measuring creates a very strong bond of trust between the dentist and the patient. The best way to understand the benefit of measuring the ISQ value is to compare it with the ultrasonographies during pregnancy: It just gives you the certainty that everything is fine – and that's why I consider it to be an ideal screening method.

Thank you very much for your explanations, Professor Kuchler.

MT

Assoc. Professor Ulrike Kuchler and EDI Project Manager My To after the EAO Osstell Symposium.

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bredent receives "Trusted Quality" award for blueSky implant

A global quality seal

After successfully passing a comprehensive analysis and a subsequent peer-review process, the blueSKY implant system of German implant manufacturer bredent was awarded the "Trusted Quality 2018–2019" quality seal by the CleanImplant Foundation. The certificate was handed over at the beginning of October during the EAO in Vienna, Austria.

How can clinicians know which implants are not affected by impurities? With the variety of implant systems offered on the market, it has become increasingly difficult for the dentist to choose a safe system for the practice. The CleanImplant Foundation has set itself the goal of providing this information worldwide. The independent non-profit organization is supported and controlled by a Scientific Advisory Board, which is chaired by renowned scientists and practitioners, such as *Professor Tomas Albrektsson* (Sweden), *Professor Ann Wennerberg* (Sweden), *Dr Michael Norton* (UK), *Professor Hugo de Bruyn* (Netherlands), *Professor Florian Beuer* (Germany), *Dr Scott D. Ganz* (USA), *Dr Jaafar Mouhyi* (Morocco), and *Dr Luigi Canullo* (Italy). In 2017, this board set the criteria for the CleanImplant Trusted Quality Mark.

A five-step approach

The CleanImplant Foundation established a thorough and accredited testing procedure that guarantees unbiased results for the new global quality seal. The process consists of five steps, i. e. a random sample collection of five implants; ISO class 5 cleanroom environment conditions; an accredited process of SEM (scanning electron microscope) analysis; full-size high-resolution SEM imaging and a final peer-review process, in the course of which two members of the Scientific Advisory Board independently review the comprehensive report of analysis and correspondent clinical documentation.

The blueSKY implant system of bredent medical now joined the elite group of tested and demonstrably clean implants.

"A continuous contribution to oral health"

The beginnings of the success story of the SKY implant system lie in the early 2000s. Today, 15 years later, the bredent group, with over one million implants sold, is one of the world leaders in immediate restoration. Today, implantologists and dental technicians trust a proven, well-matched system that can be successfully integrated into their practice right from the start. More than 50,000 satisfied patients have been treated over the past eleven years, confirming the success and safety of the procedure.

Peter Brehm, Managing Director of bredent, was highly satisfied when he received the award during the EAO event in Vienna from the hands of *Dr Dirk Duddeck*, Director of the CleanImplant Foundation. *Brehm* commented, "I am particularly pleased that our blueSKY implant receives the 'Trusted Quality' award of the CleanImplant Foundation, because it proves that bredent continuously contributes to optimal oral health. It underlines our proprietary strategy which is based on our highly biocompatible BioHPP, a PEEK material which is known to be less susceptible to bacterial colonization, and our Helbo therapy, which helps to prevent inflammatory processes in the oral cavity. Health starts in the mouth and our company philosophy attaches greatest value to the fact that implant restorations should contribute to a long-lasting improvement of patients' quality of life. The award shows that we are heading in the right direction." *EDI*

More information

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2018 Regional European Congress of Alpha-Bio Tec in Monte Carlo, Monaco

30 years of Simplantology

In October, Alpha-Bio Tec, a leading developer and manufacturer of advanced dental implant solutions, gathered an illustrious circle of European speakers at the Mediterranean coast of Monaco to discuss "Future Simplantology: The Convergence of Evidence and Digital Innovation". EDI Journal Project Manager My To was on site and summarizes her insights.

"Alpha-Bio Tec's ambition is to simplify implant procedures", emphasized General Manager Yuval Grimberg during his welcoming speech.

The two-day congress programme started with the opening address of Alpha-Bio Tec General Manager *Yuval Grimberg*, who described the company's history and explained what 30 years of Simplantology really mean: a reduction of the number of tools that are necessary to achieve successful and predictable results in implant treatments, one of Alpha-Bio Tec's first and foremost objectives. "The upcoming opening of our new training facilities in Israel underlines our strategy to support customers not only with efficient and simple solutions, but also with corresponding education and training, and it is yet another proof for our continuing growth ambitions", emphasized *Grimberg*.

The Scientific Director of the congress, *Professor Patrick Missika*, Head of the Implantology Department and Vice Dean of the Paris Diderot University Dental School (Paris, France), welcomed the more than 500 participants from 18 countries. He initiated the series of scientific lectures with his presentation on a "New approach for immediate implant placement after extraction" (see interview on next page).

The first speaker, *Dr Borja Diaz Oliver* (Madrid, Spain) explained how meticulous case planning helps to save time for both the practitioner and the patient. In his presentation on "3D planning based on DSD for placement of implants and immediate loading prosthesis", he described the two treatment possibilities if the anatomical conditions of a case are not ideal: either to convert the conditions by tissue regeneration surgery or to compensate the situation with the help of the prosthesis design. By means of several own patient cases, *Diaz Oliver* described step by step how he plans and designs a completely digital treatment workflow.

Uli Hauschild (Sanremo, Italy) complemented the dental practitioner's approach with the perspective of the dental technician. "A close cooperation between the surgeon and the dental technician offers the greatest guarantee of success", explained *Hauschild* and continued, "The computer can do everything you can do with your hands, but it can't do the thinking for you."

In an interactive session, *Dr Martin Grieß* (Lippstadt, Germany) and *Dr Gadi Schneider* (Maccabim, Israel) described the key factors for the use of guided surgery: reduced chair time, more comfort for both the practitioner and the patient, a greater accuracy of the implant position, and increased patient safety. Asked for their opinion on which of these reasons counts most for them, 69 per cent of the audience decided that all reasons were equally important to them.

Before pointing the way "From the virtual planification to implant surgery" by outlining the digital workflow step by step, *Dr Ioana Datcu* (Ravenna, Italy) first answered the question of how the new technologies help practitioners to improve and facilitate their work. She summed up the three main factors: data acquisition (DVT, intraoral scan, and the like), data elaboration (merging of collected data and planning), and data production (for example milling of the final restoration or 3D print of a surgical guide). The obvious advantages of 3D implant planning, according to *Datcu*, are proved by the increasing number of immediate placement procedures, immediate loading and an improved predictability of the aesthetic outcomes.

Aesthetics are built of three essential cornerstones: the teeth with their shape, color and posi-

tion, the gingival architecture, and the lips, which form the frame of the smile and delimitate the aesthetic zone. This statement was the introduction to the lecture of *Professor Virginie Monnet-Corti*, Head of the Department of Periodontology of the University of Aix-Marseilles (France). In her scientifically based presentation "Think Pink in Esthetics of the Smile", *Monnet-Corti* explained the factors that clinicians must consider in order to meet aesthetic requirements, and she described the surgical pitfalls that must be avoided to achieve predictable results.

Dr Attila Bodrogi (Budapest, Hungary) dedicated his speech to bio-hacking and tissue engineering, asking whether this was "The missing link in digital implant dentistry?" Based on numerous clinical cases, he showed how biohacking methods like PET (partial extraction technique), DTR (drill through roots technique or PRF (platelet-rich fibrin) can be used to support hard and soft tissue structures and their regeneration.

"The times they are a-changin", stated *Dr Patrick Simonet* (Paris, France) in allusion to *Bob Dylan*'s famous song, referring to the different aspects of occlusal overload and the paradigm shift that has taken place in this context over the years. He confirmed that bruxism is unlikely to be a risk factor for implants and stated that "today we know that we cannot cure bruxism. We can only control it with night guards. But in many cases, we first have to prove to the patient with a brux checker that he actually does grind his teeth."

The last presentation of the extensive scientific programme was held by *Dr Carlo Poggio*. In his vivid lecture with the title "Trends and challenges in contemporary prosthodontics", the practitioner from Milan, Italy, described how treatments can be managed in a much simpler way if the practitioner responds to the patient's wishes and does not always insist on "perfection" from his own professional point of view. *Poggio* also proved to be a great advocate of hopeless teeth and asked how hopeless many of them really were. "A great number of so-called hopeless cases can be preserved for a very long time if you give them a chance, especially if the patient does not insist on having an "American smile", was *Poggio's* conclusion.

Comprehensive information on the latest trends and developments in modern implantology, multifaceted opinions on the pros and cons of digital innovations, a rewarding professional exchange with colleagues, and last but not least many pleasant hours in the sophisticated ambience of the Monte Carlo Bay Hotel: that's what all attendees take back home the 2018 Regional European Congress of Alpha-Bio Tec in Monaco.

MT

A question on the sidelines

Professor Missika, could you give us a summary of your speech and a realistic assessment of the actual state of affairs of digital dentistry?

Gladly. In my lecture, I emphasized to what extent the aesthetic demands on the part of patients, but also on the part of the practitioner himself, are increasing continuously. The use of new digital tools can often be very helpful to achieve these objectives. This also applies to immediate implant placement, an increasingly popular and sought-after procedure. The digital technologies make it possible to plan the implant position and the prosthetics very precisely before surgery, which means that the newly placed implant can even be loaded immediately in many cases. However, in this context, the experience of the practitioner is still key in order to evaluate the clinical risk and to be able to decide when to change a procedure and wait. And one key factor in immediate implant placement is certainly the careful cleaning of the alveolus after extraction, in order to ensure that it is really free of bacteria or granulation tissue, especially in patients with periodontal disease. This step may seem minor but usually takes the most time during surgery!

On the other hand, I would like to stress that these digital innovations must not lead to treatments becoming more complicated, more extensive or more expensive. Digital technologies can be necessary and beneficial, but their use always depends on the individual case. And every single case must be individually assessed and planned by the implant dentist, independent of digital tools.

MT

The Scientific Director of Alpha-Bio Tec's 2018 Regional European Congress, Professor Patrick Missika, outlines his view on digital dentistry.

Open house at Atlantis production in Mölndal, Sweden

“Custom-made jewels”

On invitation of Dentsply Sirona, highly interested visitors experienced two decades of ongoing Atlantis innovations during a guided tour through the company’s production facilities in Mölndal, Sweden. My To, EDI Journal Project Manager, was one of the visitors.

After the introduction to the Dentsply Sirona Implants headquarter and an overview of the Atlantis manufacturing process, guests could experience the world-class Atlantis production facilities themselves. On a guided tour, they were able to observe from close up how Atlantis abutments are tailored to the requirements of individual patients.

For almost two decades, Atlantis has been equated with prosthetic products, solutions and services that are developed to meet the needs of both the treatment team and the patient. Atlantis products and services are sold and distributed by Dentsply Sirona in more than 40 markets all over the world.

Opened in 2008, Mölndal is one out of five of Dentsply Sirona Implants’ production sites for suprastructures, abutments and crowns. The site in Mölndal has a staff of 350 employees, of which 90 employees are dedicated to the development and production of Atlantis abutments. Dentsply Sirona uses the latest developments in manufacturing technologies as well as computer-based industrial and medical-device expertise. In addition, the dental company applies engineering principles to design and produce consistent, high-quality, patient-specific implant restorations for all major implant systems. In the course of the past 20 years, more than three million Atlantis abutments have been manufactured globally.

Visitors at Atlantis in Mölndal could, among other things, gain insights into the digital workflow.

Atlantis is an easy and reliable way to provide every patient with an optimally designed and produced prosthetic restoration, based on either a conventional or a digital impression and the corresponding case description. For maximum ease of use and precision, all Atlantis solutions are designed, reviewed and manufactured based on the individual patient data. All solutions are available in different materials to satisfy both the functional and the aesthetic needs of every patient case. Complementing material selections are numerous design options based on a vast clinical database, technical know-how and long-standing experience.

Fabrication is then executed by high-precision Swiss milling machines, which have been individually adapted to the special production needs.

“The visit of the Atlantis plant in Mölndal really impressed me. On the one hand, the company still carries the image of a family business: The employees are highly dedicated and embrace their mission to deliver ‘custom-made jewels’ to their clients. On the other hand, Atlantis’ customers benefit from the great expertise of an international group offering a complete digital implant workflow under one roof”, said *My To* after her visit. (See also interview with *Jo Massoels*, Director Digital Implant Solutions Platform, on the following page).

EDI

More information
www.dentsplysirona.com

Interview with Jo Massoels

Atlantis is a great name when it comes to CAD/CAM-supported outhouse production. Where do you see the advantages of a centralized production?

Much of the advantages of centralized production is about our innovative strength which draws on the experience that we could gather over 20 years. As a customer, you get our innovations for free and you are always sure to keep pace with state-of-the-art products and technology without having to invest personally into equipment which might be outdated within a few years. Another aspect is the very large number of abutments that we fabricate. In the meantime, we have produced more than three million abutments, so that's a huge knowledge base we rely on. We really know what works and what does not work – so this means a lot of security for dental technicians and clinicians who work with us. And then there is the consistent quality that is behind it. That is another big advantage of centralized manufacturing: You fully control the production loop end-to-end. And that's why we offer full warranty on our products, which again gives clinicians and dental technicians a lot of peace of mind.

Currently, the surface quality of machined custom-made implant abutments is the subject of many discussions. What do you think of a defined microroughness in the submucosal area?

When you talk about that topic, you get many different opinions. We have been looking into this as long as we offer this portfolio. If the surface below the mucosa is very smooth or shiny, it is prohibiting soft tissue attachment. On the other side, if you make it very rough, you definitely have a risk of plaque accumulation. So where is the balance? What we know is that our defined roughness is very successful, and for that reason we apply exactly the same microroughness globally. It is standardized – and our trade secret. We don't want any deviation because we believe that with the numbers we have, we have our recipe for success.

Catchword lasermelting. Could you give us a short explanation in which cases you prefer this technology and why?

We started lasermelting, or we call it "additive manufacturing", about three years ago for superstructures. Before, we were milling those out of a big block of titanium which means that there was a lot of material loss. So we decided pretty early on to move to lasermelting, to additive manufacturing. We believe in the technology because you print only a little bit more of what you need while the actual implant interface is still milled with a conventional milling machine. So it's actually a hybridization of technology: You first use 3D printing, additive manufacturing, and then you apply the milling for the accuracy of the connection.

There are two main benefits with additive manufacturing: One is the multiplied surface which gives the dental technician about three times the space for the prosthesis to grip on – kind of a mechanical retention that you create by this surface. And the other one is the angulated screw access which can be incorporated easily with the additive manufacturing technique. What is key to understand is that the accuracy you need for the superstructure is not as big as the one you need for the interface. For implant connections, you still need milling. That's why we use the hybridization of both technologies.

With the industrial production, there are hardly any limits to the realization of different designs. Are improvements still possible at all, and if yes, what can dental technicians and clinicians expect in the near future?

We already talked about the angulated screw access which represents a great step forward. And there will be more improvements on the abutments themselves – mostly technical ones. That is one aspect. The surface engineering is another very interesting field. Think, for example, of an active surface that could actually kill bacteria, at least in the initial stage of osseointegration. And we are working on the expansion of our services in the area of 3D printing: If you want to make a very nice crown, you still need a model to do the veneering, so we will soon be offering the option to order a 3D printed model together with your abutment.

And there is still a lot of room to improve the connectivity and software as part of the digital implant workflow. Take the Atlantis editor as an example: The dental technician can view and basically change the whole design. We make a design proposal, but of course the technician has his own knowledge and he may have certain specific requirements in mind that he wants to apply. So he is still in full control of his design despite outsourcing. That is important and we achieve it with software tools like the Atlantis editor.

Another area we are actively working on is the use of artificial intelligence. Due to the millions of abutments that we have produced, we have an unparalleled wealth of data. With AI, we will be able to process all of these data and might be offering fantastic services to our customers in the future. A prospect that is really very exciting … *MT*

A visit at the corporate headquarters of Anthogyr in Sallanches, France

A prime mover in implantology

In Sallanches, at the foot of Mont Blanc, Europe's highest mountain, a family of clock and watch-makers created Anthogyr seventy years ago. Today, the company has the advantage of a site that is unique in terms of excellence, one that never fails to impress visitors. EDI Journal Project Manager My To took a tour of the location and also talked to Anthogyr Sales Director Philippe Neimark.

Founded in 1947 as a manufacturer of small dental instruments, Anthogyr today is specialized in implantology. Implants and customized prostheses are at the heart of business activities, which also include implantology devices like motors, contra-angles, handpieces, and a whole range of corresponding services and trainings.

Ensuring customer satisfaction is a value that is strongly anchored in the Anthogyr philosophy. Consequently, listening to the needs of practitioners and consistently anticipating market needs are among the core tasks of the company.

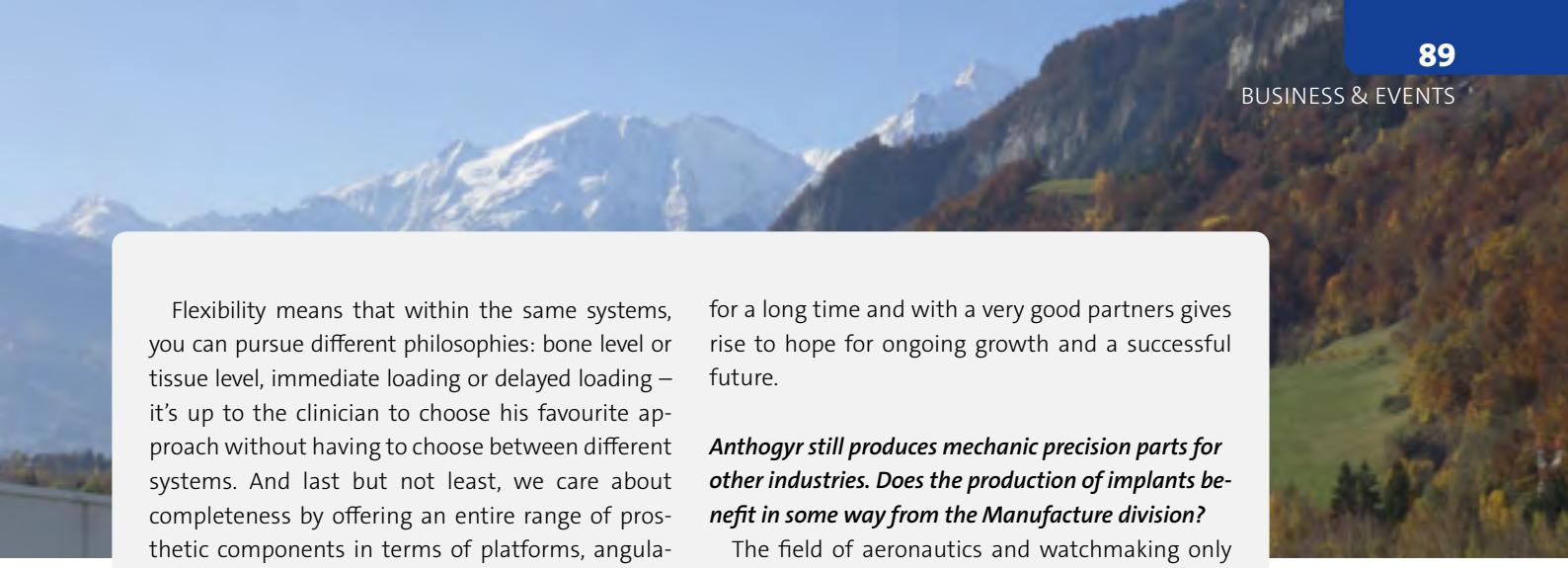
Quality is a second factor to which Anthogyr attaches utmost importance. With constant investment, the company's industrial site is kept at the cutting edge of technology. All production areas are certified in accordance with ISO standards, thus facilitating full compliance of their products with the applicable directive and standards. Autonomous, functional and ultra-modern, the 9,400 square meter industrial site includes all of Anthogyr's strategic, industrial and operational departments. Industrial expertise is present everywhere, starting with design, and in each stage of the manufacturing process. The skills of Anthogyr's employees are second to none, fostered by 70 years of experience in the precision medical and aeronautic industries. With research and production procedures handled entirely in-house, Anthogyr builds its expertise and ensures uncompromising quality.

Focusing also on the well-being of its employees and on the environment, Anthogyr has always been promoting a sustainable approach to development with the objective of minimizing its impact on the environment, which includes complete traceability of components and procedures from raw materials to the finished product; systematic reprocessing of air, oil and solvants; selective collection and sorting of waste (paper, glass, titanium, stainless steel, aluminium, and so on); and the use of paper manufactured using resources from sustainably managed forests. Currently, Anthogyr employs more than 430 people and is present in 80 countries on all five continents. ■

Interview with Philippe Neimark

Could you describe the unique selling point (or USP) of Anthogyr compared to other manufacturers of titanium implants?

Generally spoken, the uniqueness of Anthogyr relies on three pillars: simplicity, flexibility and completeness. We try to offer simple solutions that can be used by a maximum of practitioners, whether experienced or beginners, and for all possible kinds of indications, whether surgical or prosthetic. But simplicity also refers to the practical work; for example to the fact that you can use the same surgical kit for four different implant types or the same connection for all implant diameters.



Flexibility means that within the same systems, you can pursue different philosophies: bone level or tissue level, immediate loading or delayed loading – it's up to the clinician to choose his favourite approach without having to choose between different systems. And last but not least, we care about completeness by offering an entire range of prosthetic components in terms of platforms, angulation, gingiva height, cement- or screw retention, fixed or removable, and so on. With our acquisition of Simeda in 2012, we have complemented our offer and also provide CAD/CAM solutions for three different materials: titanium, cobalt-chrome and zirconia.

But our most important USP, in my eyes, is our innovative strength. Real innovations offer an added value to the customer, and that's what our innovations do. Take our inLink connection or the Multi-Unit angulated access as an example – efficient, high quality solutions that definitely improve the daily work of dentists and technicians and by that the life quality of their patients.

Which is Anthogyr's most important market and which strategy does the company pursue in terms of market expansion?

France has obviously been one of Anthogyr's main markets for 70 years, but the company has always been international in terms of distribution, with subsidiaries in the principle European markets. Nevertheless, there is still a lot of development potential in these markets which we will try to tap in the short run.

Another very important market is China because of its size and our historical presence. We already founded a direct sale subsidiary in China about ten years ago when the country was still an emerging market – which now turns out to be a great advantage. With all the regulatory constraints, it takes a lot of time to establish oneself in the Chinese market and with our longstanding presence there, we are ahead of many competitors.

Two years ago, we also signed a partnership agreement with the Swiss company Straumann to accelerate our growth in China. Straumann takes care of the distribution of our products while expanding their own catalogue with appealing items that are accessible to a sector with strong increase. As the Chinese market is still developing at a fast pace, it will definitely be one of the main implantology markets within three or four years, before the US and Brasil. Already being well-established there for a long time and with a very good partners gives rise to hope for ongoing growth and a successful future.

Anthogyr still produces mechanic precision parts for other industries. Does the production of implants benefit in some way from the Manufacture division?

The field of aeronautics and watchmaking only makes for less than 10 per cent of Anthogyr Manufacture's production; medical appliances, especially orthopaedics, account for more than 90 per cent of the division's sales. For a long time, Anthogyr served as a subcontracting producer of mechanic precision parts and implants before the company decided to establish its own brand. I am sure that the long experience and the excellent reputation that Anthogyr has acquired during this time is very helpful. The materials of orthopaedic implants are often similar to those of dental implants and the know-how that we have accumulated as well as the developments that we have made in orthopaedics can to a certain extent be transferred to the dental sector. Our company has proven to be a trusted partner with high standards, high demands and high quality, and this trust leads to a high appreciation on behalf of our customers.

Anthogyr has just celebrated its 70 anniversary and has entered dental implantology about 20 years ago. How did that come about?

Anthogyr started the fabrication of dental instruments in the 1940s; about 40 years later, the company entered the production of dental implants for other companies. As we produced a very large number of implants for the French market and realized that the demand was rising, we decided to produce an own brand of implants for international markets.

Then, at the beginning of the millennium, we were confronted with an important question of strategy: We had a broad product portfolio and implants were only one part of this portfolio. At a certain point of size, it started to be difficult to master all the challenges of such a broad portfolio – conception, fabrication, distribution, marketing – at the same level and we realized that we needed to take a decision. So we chose implant dentistry as our special field of activities. And as you can see, our success proves us right.

Thank you very much for your time and the interesting insights, Mr Neimark. *MT*

Training course at the BTI Biotechnology Institute

Achieving excellence in the daily practice

BTI Biotechnology Institute is a Spanish biomedicine and biotechnology multinational company. Its activity is focused on the development of R&D&i projects which it applies to its three main fields of work: regenerative medicine, oral implantology and biomaterials. Training is one of BTI's basic pillars, and for this reason it dedicates many of its resources to a wide range of courses and workshops. EDI Journal Project Manager My To was invited to attend the course "A biological approach to implantology" and summarizes her lessons learned.

The BTI – Eduardo Anitua Institute Postgraduate and Training Centre is situated in Vitoria-Gasteiz, the capital of the Basque Autonomous Community in northern Spain. The centre is equipped with the most modern medical and audiovisual technologies, a vast auditorium with a capacity for 74 people, a practice laboratory and two tuition classrooms.

Dr Eduardo Anitua, founder and Scientific Director of the BTI Biotechnology Institute, extended a warm welcome to the participants and kicked off the training with a detailed introduction of the BTI system. During the ensuing live surgery, the participants were able to live the BTI implant experience at close quarters.

The afternoon of the first course day was dedicated to Endoret, a plasma rich in growth factors (PRGF) developed by BTI Biotechnology. Endoret supports the use of the organism's own resources for effective tissue regeneration without side effects. *Dr Gorka Oribe*, Ass. Professor of Pharmacy at the University of the Basque Country (UPV/EHU), explained the concept of regeneration with PRGF from the physiopharmacological point of view and described its application in different medical fields. More than 200 scientific publications, mainly in the field of maxillofacial surgery, have been published since its first use 20 years ago. *Oribe* gave an overview of the different application forms: liquid matrix or scaffold for extraction sockets as well as membranes, eye drops, and gel for injection. While the addition of calcium chlorite activates the growth factors in the PRGF, the special calcium surface of BTI's Implant line UnicCa triggers the same mechanism, thus avoiding an extra step in the preparation of the activated PRGF.

Dr Anitua went on to explain the use of Endoret in post-extraction sockets and deepened the theoretical knowledge in an instructive hands-on workshop.

The next course day started with *Dr Anitua's* in-depth lecture on the indications of PRGF and the use of Endoret in special situations, namely in patients suffering from bisphosphonate-related osteonecrosis of the jaw (BRONJ). During the ensuing conference on the UnicCa implant surface of BTI's implant line, the commited implant surgeon and researcher explained its antibacterial mechanism and described in detail how the chemical modification of the surface with calcium ions helps to prevent the formation of biofilm.

After the lunch break, a hands-on workshop conveyed all details a practitioner needs to know about the placement of short implants and the correct procedure in case of a failed implant that has to be extracted. The second live surgery of the training course put the theoretical principles of minimal invasive treatment into practice: Short implants were placed in order to avoid a sinus lift. In the last lecture of the extensive agenda, *Dr Anitua* explained how surgery in atrophic maxilla cases can be minimized.

"Training is one of BTI's basic pillars and for this reason, we dedicate many of our resources to a wide range of courses and workshops. Our main objective is to be close to professionals, helping them to achieve excellence in their daily practice, which has a direct influence on the well-being and health of patients. The positive feedback from our participants encourages us to continue along this path", concluded *Dr Anitua* at the farewell of his guests.

MT

Z-Systems receives CE approval for all-ceramic screw-retained bone level implant

A completely metal-free solution

Z-Systems, a leading company in ceramic implants technology, announces the CE approval of its innovative 100 per cent ceramic screw-retained two-piece bone level implant Z5 BL.

Z-Systems is once again bringing a metal-free innovation to the dental implant world with a brand-new ceramic product. The company is proud to announce the CE approval of its latest innovation: the Z5-BL bone level implant. After years of research and development, Z-Systems is ready to launch the proprietary full ceramic, screw-retained two-piece implant with a newly developed ceramic screw. The new screw-retained connection is based on a conical design with an inner thread retaining the abutment through a screw, ensuring a micro-gap free connection. The enossal shape of the implant is based on the company's tissue level implants, which – with almost 60,000 units sold – deliver excellent results in osseointegration and stability. The platform switch allows for a reduced load on the crestal bone. Like every Z-Systems implant, the new Z5-BL implant features the company's proprietary, patented and proven SLM surface. The new Z5-BL implant will come to market with a wide range of prosthetic options, allowing for optimal aesthetic results and flexible functionality: a true alternative to two-piece titanium implants for another completely metal-free solution.

Available with a next generation surgical kit as well as a titanium screw – in addition to the new ceramic screw – the Z5-BL offers the most flexibility to practitioners in the market place.

100 per cent ceramic: Z-Systems' new Z5 BL implant.

More information
www.zsystems.com

National Osteology Symposia in Italy and France

Tools and strategies for regenerative therapies

The National Osteology Symposia have earned a great reputation over the years. In autumn 2018, Turin and Paris were the places be for anybody interested in oral tissue regeneration, where the Osteology Foundation had organized its National Symposia for Italy and France. Both events covered a broad spectrum of topics in their lectures and workshops and offered an ideal blend of theory and practice.

Almost 1,300 participants attended the congress from 27 to 29 September 2018 in the Lingotto Congress Centre in Turin, Italy. The Chairmen of the congress, *Mario Roccuzzo*, *Mariano Sanz*, and *Istvan Urban*, had put together an outstanding programme with renowned international experts and the who's who of oral regenerative therapies in Italy. "Long-term success: tools and strategies for regenerative therapies" was the joint headline for the workshops, discussions, poster and oral presentations, as well as scientific lectures which covered all aspects of oral tissue regeneration, provided practical aspects, and highlighted the latest research results. Dental hygienists had the opportunity to attend a special course with lectures tailored to their specific needs.

With his scientific presentation, Osteology Foundation President *Mariano Sanz* opened the main programme. He discussed "light and shadow in oral tissue regeneration" and presented novel therapy methods, materials and technologies for periodontal and bone regeneration. *Sanz* explained that, at present, xenografts are probably the most reliable materials, but, in the future, there might be a shift towards allografts or synthetic materials. Regarding growth factors such as BMP, he mentioned that the right dosage is still not known. He indicated that cell therapies and 3D-printed scaffolds are looking very promising for the future.

Ronald E. Jung presented the outcome of the Osteology Consensus Meeting 2017 on the importance of peri-implant tissues. By means of a clinical case, he illustrated the conclusions and demonstrated the clinical relevance of the consensus outcome. In the research session on day one, six young researchers competed with their presentations for the Osteology Young Speaker Award 2018. *Roberto Farina* from the University of Ferrara received the prize for his outstanding presentation.

Biology, aesthetics and background

More than 430 participants came together at the Cité Internationale Universitaire de Paris (CIUP) from 18 to 20 October to visit Osteology Paris 2018. According to the topic of the congress "From biology to aesthetics", seven international and 31 national speakers addressed various facets of oral regeneration, starting from different clinical aspects of sinus lift procedures to immediate implant placement and immediate loading, pre-implant bone surgery, risks in peri-implantology and soft tissue management.

The symposium started with several practical workshops, during which participants could increase their dexterity. The Osteology Foundation contributed two workshops to the congress programme. *Daniel Thoma* from the University of Zurich enlarged the knowledge of the attendees with his workshop on "Soft tissue management with a collagen matrix of stable volume", while *Maurício Araújo* from Brazil covered "Extraction socket management for predictable ridge preservation" in his practical etude.

In the special sinus forum on Thursday afternoon, all talks focussed on the topic of sinus floor elevation while the main programme on Friday and Saturday was dedicated to all aspects of oral tissue regeneration and peri-implantitis. The programme was closed by *Daniel Thoma* with a presentation about the paradigm change in soft-tissue augmentation. *EDI*

More information
www.osteology.org

Camlog inaugurates state-of-the-art sales building in Wimsheim, Germany

A symbol of the future

Camlog has reached another important milestone with the inauguration of its new building in Wimsheim, Germany. The new building covers approximately 5,000 square meters and creates space for more jobs in the future. Camlog team members, along with Stanley Bergman, Chairman of the Board and Chief Executive Officer of Henry Schein, Inc., the parent company of the Camlog Group, were joined by international business partners, investors, and government officials at the inauguration ceremony in October.

"It's a pleasure to be here to help inaugurate this beautiful new building, and to underscore our commitment to Camlog, the oral surgery segment of the global oral health market, and the Wimsheim region", said *Stanley Bergman*. "The new building is a symbol of our future and reflects Henry Schein's strong commitment to Camlog, the category champion in Germany, and an outstanding team dedicated to creating great solutions for our customers."

In an increasingly dynamic and complex competitive environment, companies must become more agile. The open space concept of the new building creates an environment that promotes active communication, makes processes more transparent, and enables faster solutions through direct contact with colleagues. The floor plan is divided into work zones and offers areas for individual work at desks as well as project zones with a quiet, living room-like environment to foster creativity and collaboration. Employees can decide where and how they want to work. They can adapt their workplace to their current task. Maximum flexibility, short coordination channels, and open communication will also contribute to greater efficiency and productivity among the team to enhance the future growth and expansion of the company.

"The ultra-modern sales building is the ideal foundation for further developing the Camlog portfolio and driving growth forward. It is a symbol of Camlog's ongoing commitment to put the team's talents at the centre of our strategy", said *Dr René Willi*, member and delegate of the Board of Directors of Camlog Holding AG. "Quality and 'Made in Germany' are in demand. We will continue making investments to serve all different customer needs and market segments, from the fastgrowing discount sector to the even faster-growing emerging markets."

The dental implant market is changing quickly, and Camlog answers these changes with new benefits, such as the ceramic implant system Ceralog and the implant planning service Dedicam. The Camlog team has evolved and the company's success has created more than 400 jobs in Wimsheim.

In his opening speech, *Michael Ludwig*, Managing Director of Camlog DACH, explained what is important today in dental implantology to be successful: "It is no longer enough to offer only implants. Sustainability and service concepts are becoming increasingly important. We drive innovation forward and always remain true to ourselves. The fact that approximately every fourth implant placed in Germany comes from Camlog speaks for our product and service quality and the outstanding Camlog/Altatec team. Our committed employees are fully at the disposal of our customers, exchanging ideas with them at eye level and promoting cooperation."

On moving in, *Jürg Eichenberger*, Honorary Chairman of the Board of Directors, presented Camlog with an iconic iron sculpture by artist *Pieter Obels*. As Camlog founder, *Eichenberger* has built a special bond with the company and with the region where Camlog's origins lie. The sculpture represents the philosophy of the company group with the delicate and winding shapes of steel symbolizing the team's unity to deliver numerous solutions from a single source.

Camlog's spacious new company building leaves plenty of room for the future development of the dental company.

More information
www.camlog.de

Gaining new insights

Medical Insights and the Oral Reconstruction Foundation are proud to announce the global launch of Insights Dental, the smart companion platform to the professional world of oral reconstruction dentistry.

With Insights Dental – pre-launched in April – attendees of the Oral Reconstruction Global Symposium 2018 benefitted from exclusive features, such as current programme updates, session discussions and the social wall. In addition, they gained access to a dedicated community that is already trusted by more than 140,000 surgeons worldwide in a range of medical specialties. And now the app is readily available at no cost to all dental professionals.

Insights Dental is the personalized knowledge community in oral reconstruction dentistry, keeping members up to date with the latest developments in the dental world. It gives members immediate access to leading knowledge and a global community of like-minded practitioners and specialists. Sourcing content from leading dental journals, Pubmed, as well as from respected associations, Insights Dental members can interact with key opinion leaders, follow their collections, share their own knowledge, and build a persistent record of their continuous professional development.

With dedicated mobile apps on iOS and Android, in addition to the web application, dental professionals can use and sync their Insights across all devices. Insights Dental is a free application that can be downloaded on the Apple App Store and Google Play. The web app can be accessed at dental.insights.md.

More information
www.orfoundation.org

Win a trip to Salzburg

Get your phone ready, smile and post your selfie! W&H's image campaign "From a patient to a fan" is running a big competition until 31 December 2018.

In spring 2018, W&H launched its "From a patient to a fan" image campaign. The campaign puts dentists and dental professionals into the spotlight. The aim is to celebrate these everyday heroes who ensure their patients are in safe and reliable hands. Their dedication enables them to inspire their patients again and again, turning patients into fans in the process. Due to the excellent response, W&H is now going one step further and inviting entries for an amazing competition with prizes for the whole practice team.

This autumn, W&H is set to experience selfie fever as it challenges practice teams to send in their snapshots – and now is the time to enter! W&H is looking for the best images from everyday practice life that clearly emphasize that the dentists and their team are everyday heroes. Show your creativity, wit and originality and let your imagination run wild. The best images will stand to win some fantastic prizes. The main prizes will be two four-day trips to Salzburg with a very appealing programme, each for six people. So grab your phone and get involved!

More information
www.patient2fan.com
www.wh.com

Save the date: Osteology Barcelona from 25 to 27 April 2019

Active contribution wanted!

In April 2019, Barcelona is the place-to-be for all oral and maxillofacial surgeons, periodontists, and oral health professionals interested in implant dentistry and regenerative therapies. During the international Osteology Symposium 2019, internationally renowned experts will present the current status of knowledge and research, linking science with practice in oral tissue regeneration, always true to the motto and aims of the Osteology Foundation. Both investigators and clinicians have the chance to actively contribute to the congress programme.

Investigators within the field of regenerative dentistry and oral tissue engineering are invited to submit abstracts of original research work. A scientific evaluation committee will review and evaluate all submitted poster abstracts for consideration in the Poster Presentation as well as in the Research Forum. Each abstract will be evaluated by at least two members of the evaluation committee. Posters based on accepted poster abstracts shall be presented in the congress hall. The authors of the six best abstracts in the two categories (basic and clinical research) will be able to present the content of their posters in an oral presentation in the Osteology Research Forum on Friday, 26 April 2019. The three best presentations in each of the two categories will be awarded a prize on Saturday. Deadline for the submission of posters is 15 January 2019.

Clinicians are encouraged to contribute to a new interactive format, the Osteology Case Competition, which will be part of the programme in Barcelona, by submitting a clinical case. The best cases will be invited for presentation on stage and to compete for the Case Competition Award. The Osteology Case Session and Competition will be held for the first time at Osteology Barcelona 2019. The best oral regenerative cases in six competition categories will be selected for presentation at the Osteology Case Session and the best case presentation will be awarded a prize. Cases can be submitted in the following categories:

- ridge preservation
- soft tissue augmentation/regeneration around teeth
- soft tissue augmentation/regeneration around implants
- vertical and horizontal bone augmentation
- periodontal regeneration
- sinus augmentation

The winner in each category will be invited to present their case on stage at Osteology Barcelona 2019 in the Osteology Case session on Friday, 26 April 2019. Deadline for submission of cases is 31 January 2019.

Scientific Symposium

The registration fee for the Scientific Symposium includes attendance at the complete programme on Friday and Saturday, attendance at the DGI and SEPA sessions and the Corporate Forum on Thursday, attendance at the poster and exhibition area, refreshments (coffee breaks and lunch) and admission to the Exhibition Opening. Early bookers can benefit from an considerably reduced early bird registration fee until 27 January 2019. A special reduction is granted to Young Professionals up to the age of 32 years.

More information
www.osteology-barcelona.org

Find out more about the Poster Presentation via this QR code.

Find out more about the Case Competition via this QR code.

mectron combi touch unit

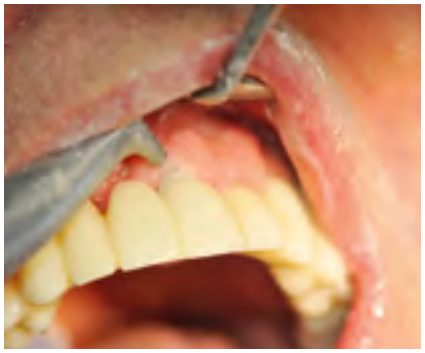
Successful implant maintenance through a combination of techniques

DR LUCA PARISI, MILAN, ITALY

Air-polishing is an absolutely indispensable procedure for decontaminating the oral cavity; it forms the basis of any primary, secondary or tertiary prevention procedure in dentistry. It is also effective for the professional maintenance of implant and prosthetic component hygiene. The air-polishing technique provides a user-friendly option for biofilm removal in patients with periodontitis and peri-implantitis. Air-polishing was first introduced in dentistry in 1945, when particles of aluminium oxide were used to prepare the oral cavity.

Bacterial biofilm plays a key role in the onset and progression of the infection involved in dental decay and periodontal disease. Periodontal disease and decay are transmissible infectious conditions caused by the pathogenic microorganisms present in bacterial biofilms. The deposition of bacterial biofilm, the very aetiology of oral cavity disease, favours anatomical areas that are difficult to reach using home oral hygiene practices, such as the areas underneath fixed restorations. The inflammation caused by bacterial plaque causes the loss of gingival attachment.

In order to achieve effective control over bacterial plaque, especially in areas that are difficult to reach (such as the interdental spaces), home oral hygiene must be maintained, and patients must be correctly informed of how absolutely essential it is in ensuring the health of oral cavity tissues and maintaining restorative therapy.



1 I Glycine powder jet aimed directly at the implant neck and prosthetic component.

2 I Combi touch unit combining an ultrasonic handpiece and glycine and bicarbonate powders.

The treatment and maintenance of implant sites requires an effective and minimally invasive treatment that is readily accepted by the patient and that the practitioner considers to be ergonomic and safe for the implant structures (titanium and prosthetic materials). The best materials currently available are prophylaxis powders, more specifically, glycine powder, and non-invasive ultrasonic scalers, such as PEEK inserts.

Glycine is a non-essential amino acid. It is an odourless, colourless and highly water-soluble substance; it has very low toxicity, is non-allergenic and has a very subtle sweet taste. Glycine is also believed to have an anti-inflammatory, immunomodulating and cytoprotective effect in a number of therapeutic approaches. Although its exact mechanism of action is still partly unclear, the application of glycine causes the suppression of the calcium-sensing receptor and the inhibition of inflammatory cell activation. Glycine also reduces free radical formation by inhibiting macrophage activation. This substance appears to be very well suited to intraoral use. The non-abrasive glycine powder used with air-polishing devices takes the form of microscopic crystals.

The combi touch unit (Figs. 1 and 2), used in the case report described below, represents an excellent approach for the treatment of implant sites. The device combines a multipurpose piezoelectric scaler and air-polisher in a single appliance, affording complete supra- and subgingival prophylaxis. ››

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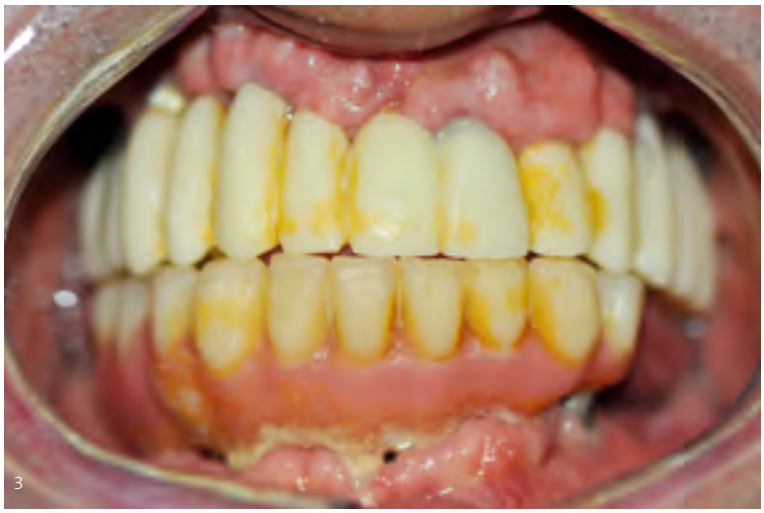
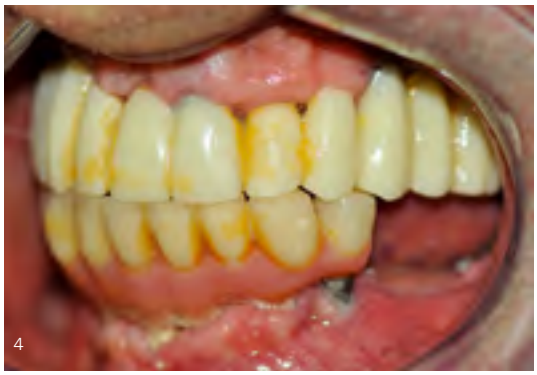
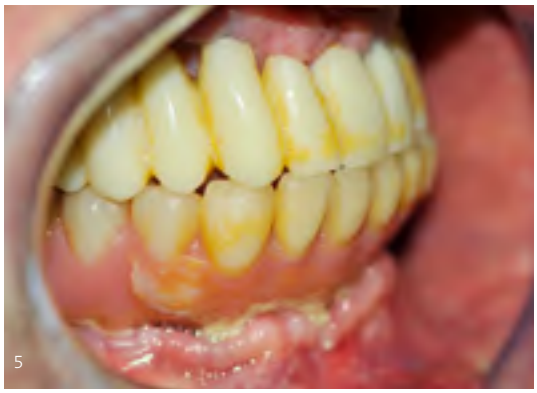






3 I The patient's initial situation (frontal view).
4 I The patient's initial situation (left lateral view).
5 I The patient's initial situation (right lateral view).

With its "soft mode" feature, the scaler handpiece performs ultra-gentle scaling, whilst guaranteeing optimum performance on prosthetic components. The air-polishing handpiece allows for the use of two different types of powder (sodium bicarbonate and glycine), depending on the type of treatment to be performed. This offers the great advantage of being able to use both powders on the same patient with a simple click.

Unit maintenance is quick and easy, because the powder bottles can be removed without having to switch off the device, and an exclusive feature prevents powder clogging. It can either be connected to the practice's normal water supply or used with an external 500 ml bottle.

Case example

A 55-year-old male patient, who has been treated by the practice for a number of years, eventually comes to the practice for a cleaning after a number of missed hygiene and check-up appointments (Figs. 3 to 5). His dental status consists of a temporary full lower-arch implant-restrained Toronto bridge and a temporary upper-arch implant-supported overdenture.

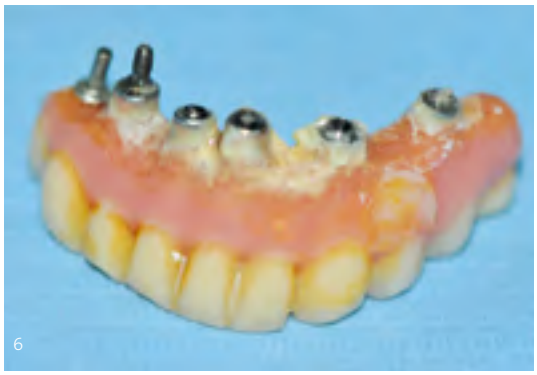
The physical exam reveals visible redness around most of the implants with the presence of abundant bacterial biofilm, plaque and tartar. Tartar was particularly abundant on the lower arch.

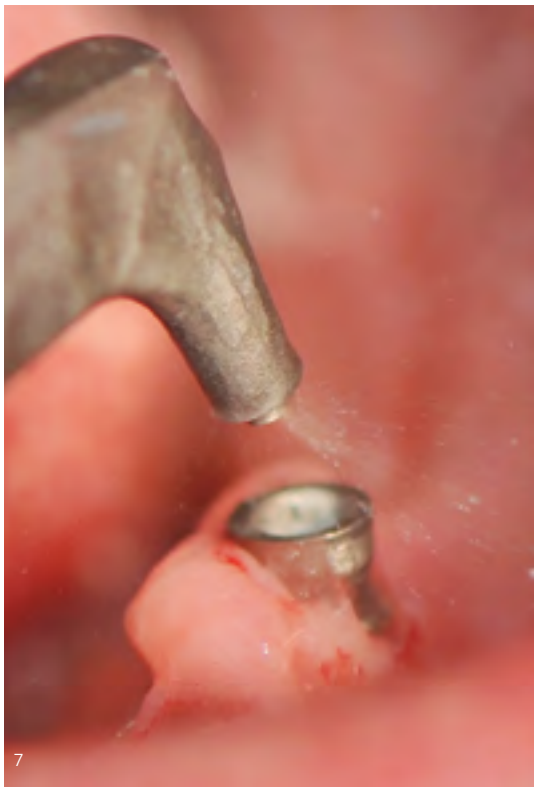
It was decided to remove the lower restoration in order to effectively eliminate all soft and hard deposits (Fig. 6). A cleaning was performed using:

1. glycine powder to treat the implants (Fig. 7);
2. a PEEK insert for ultrasonic scaling to remove the hard deposits from the implants (Fig. 8); and
3. additional glycine to remove any other soft deposits and for polishing. The treatment approach was applied on both arches (Fig. 9).

The special angle of the 120° glycine powder nozzle facilitates plaque removal, even in cases where the practitioner encounters problems caused by particular anatomical soft tissue structures and the positioning of implants or prosthetic components in areas that are difficult to reach. The cleaning continues outside of the patient's mouth with the removal of tartar and plaque from the Toronto bridge using glycine and bicarbonate powders (Fig. 10). As glycine is not abrasive, it does not damage fixed or mobile prosthetic components.

The patient is re-sensitized regarding oral hygiene at home, and the importance of regular check-ups and hygiene appointments in order to maintain oral health is explained to him. He is shown how to use home oral hygiene devices correctly. In this case, we recommend a sonic toothbrush, interdental brushes and AirFloss. All these devices allow for effective and nontraumatic cleaning of interproxi-





6 I Toronto bridge restoration after removal from the patient's mouth; tartar and plaque deposits are clearly visible.

7 I Glycine powder jet aimed directly at the implant site.

8 I The PEEK insert is ideal for breaking up the biofilm on implant or prosthetic components.

mal spaces that are difficult to reach, as is the case here. For chemical plaque control, we recommend twice-daily use of a chlorhexidine 0.12 % mouthwash for seven days.

The check-up performed two weeks later reveals a significant improvement in the clinical indicators. After this, professional maintenance therapy using glycine powder and PEEK scaler inserts is scheduled for every other month.

Conclusion

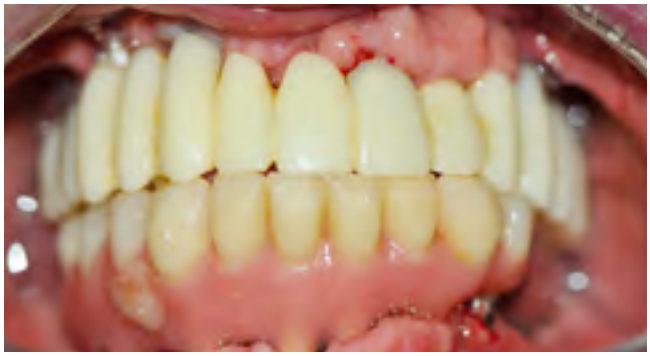
Combi touch technology allowed the practitioner to effectively treat this complex case of implant restoration. The device makes it possible to use different types of powder to meet different requirements, with the advantage of being able to work ergonomically and reach all areas with ease. Additionally, when using the ultrasonic scaler handpiece, the PEEK insert was found to be an ideal and non-invasive solution for biofilm removal and break-up.

The great advantage for the practitioner is therefore being able to use a full, easy-to-use and minimally invasive set of instruments for oral hygiene, even in critical cases of gum disease.

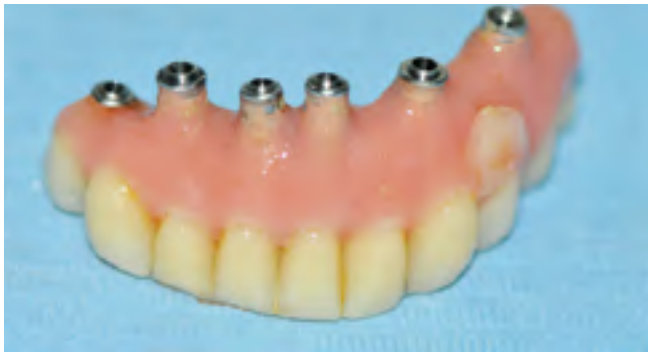
The references are available at www.teamwork-media.de/literatur

More information

www.mectron.com



9 I Final result after the professional oral hygiene treatment.



10 I Final result on the Toronto bridge after the air-polishing treatment.

NobelPearl ceramic implant solution

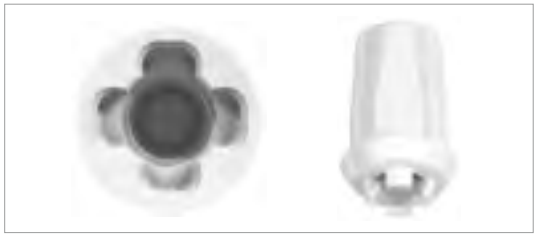
Symbiosis of natural aesthetics and soft-tissue harmony

A trend in the dental implant market is the growth in patient preference for metal-free solutions; a demand for treatment that brings the look and feel of natural teeth. For practices looking to offer their patients an alternative to titanium, Nobel Biocare has harnessed the evolution of ceramic implant solutions with NobelPearl.

NobelPearl is an adequate alternative to titanium. A one-hundred per cent metal-free, two-piece ceramic implant solution with a cement-free internal connection, it has been designed to support natural soft-tissue appearance. Its white zirconia material is especially beneficial in patients with a thin mucosal biotype [1]. Microcirculatory dynamics in peri-implant mucosa around zirconia have been shown to be comparable to those around natural teeth [2], and zirconia has also demonstrated low plaque affinity [3–5]. In essence, NobelPearl can help patients gain the natural aesthetic excellence they desire.

Cement-free flexibility

Clinicians seeking a ceramic solution for their patients might see cement as the only possibility for restoration placement. While intraoral cementation can be a viable option, the use of excess cement is known to be associated with soft-tissue inflammation and the development of peri-implant mucositis and peri-implantitis [6]. To avoid this risk through screw-retention, yet remain one-hundred per cent metal free, NobelPearl features the innovative Vicarbo screw made of carbon-fiber reinforced polymer. In addition, NobelPearl offers greater restorative flexibility compared with one-piece or cemented ceramic implants, thanks to the two-piece, reversible, cement-free internal connection design.



The internal connection is specially designed for ceramics. The abutment's simple placement and secure seating is enabled by the connection's high-precision geometry.

Metal free, yet proven in strength

Designed for a strong ceramic-to-ceramic connection, the Vicarbo screw withstands tensile forces while the ceramic absorbs compressive forces. This ceramic material – alumina-toughened zirconia (ATZ) – is proven to provide strength for success [7].

The thread design and tapered implant shape, combined with the tapered drill protocol, have been engineered to achieve high primary stability, and the hydrophilic sand-blasted and acid-etched Zerafil surface, combined with a partially machined collar, is proven to osseointegrate [8,9]. At manufacture, implants and abutments are both milled from hot isostatic-pressed (HIP) zirconium dioxide ATZ blanks – which are proven to be strong – and, at the final shaping of the implant, no sintering or finishing takes place. This enables a high level of dimensional precision and accuracy.

Embracing the evolution of ceramic solutions

The continuous development of ceramic implants by Nobel Biocare's manufacturing partner has seen an increase in survival rate at every step [8]. Now, NobelPearl is a new treatment option that follows a range of well-established workflows for two-piece implants and will be integrated into Nobel Biocare's digital workflow. Clinicians seeking a successful start in ceramic implantology and to expand their choice for patients can gain peace-of-mind with an easy-to-adopt solution.

References available at www.teamwork-media.de/literatur

More information
www.nobelbiocare.com/nobelpearl

Bien-Air Dental unveils new range of implant and oral surgery motors

Proven technology, improved features

During the 2018 EAO congress, Bien-Air Dental presented their two new implant and oral surgery motors, Chiropro and Chiropro Plus. Designed to simplify the fitting of implants as well as oral surgery procedures, the new devices have been fully developed around a single philosophy: simplicity!

A single button allows to control the entire system by simply turning the button to navigate through the menus and adjust the settings, and pushing it to confirm the selected value. The button can be easily removed and sterilized to simplify maintenance. Thanks to their clear and concise interface, the new Chiropro and Chiropro Plus plainly display all information required for procedures to work smoothly: type of instrument, speed, torque, irrigation flow and direction of rotation. Pre-set operating sequences and the option to modify settings based on patients' dental features also facilitate the use.

Though the systems are both easy to use, they have different fields of application. Whereas the new Chiropro is mainly dedicated to implantology procedures, the Chiropro Plus allows to perform both implantology and oral surgery procedures. As every clinical discipline demands a very specific group of instruments, the new Chiropro and Chiropro Plus units can be connected to the relevant micromotor and rotary instrument required for each procedure.

The new MX-i micromotor (MX-i Plus respectively) and the CA 20:1 handpiece offer the ideal rotary technology for every implantology procedure. The CA 20:1 handpiece provides an exceptionally stable speed for precise and smooth procedures, offers an outstanding service life and is fitted with a brand-new internal irrigation system.

Combined with the PM 1:2 straight handpiece and the MX-i Plus micromotor, the Chiropro Plus is an excellent solution for oral surgery procedures, and wisdom tooth extraction in particular. The cutting time is reduced by 70 per cent (just twelve seconds to fully section a tooth) and the force required is significantly reduced. The integrated self-cooling system reduces the risk of overheating considerably.

Oral surgery and periodontology procedures can also be performed with a combination of the Chiropro Plus, the MX-i Plus micromotor and the new CA 1:2.5 handpiece. The angular shape of the handpiece facilitates the access to the surgical operating site, the high torque and the built-in self-cooling system ensuring quick procedures without overheating of the instruments even during long and complex procedures.

Dr Jan Kielhorn, Öhringen, Germany, who accompanied the development of the new devices and uses them in his private practice, is enthusiastic: "One of the features I particularly like about the new Chiropro is the rotary knob, because it is much easier and faster to handle than a knob that you have to push or a touchscreen. In addition, it is easy to remove and to sterilize, which is a big plus for the assistant, as is the easy installation and operation." ■

More information
www.bienair.com

Mission accomplished: A happy team at the booth of Bien-Air Dental at the EAO in Vienna.

Expanding the TRI+ Digital Solutions

Digital. Analog. Instrument-free.

During the EAO meeting in Vienna, Austria, TRI Dental Implants presented its expanded impression taking portfolio with the innovative and patented technology for the open-tray impression. The new TRI 3D-Touch Impression, which can be used as a conventional impression post as well as a high-precision titanium scan body, is versatile, time-saving and an unparalleled impression taking experience.

Impression post and scan body in one single product: the TRI 3D-Touch Impression Post.

TRI expands its impression taking portfolio with state-of-the-art and patented technology for the open tray impression. The innovative TRI 3D-Touch Impression Post combines simplicity with specific product features. It can be used as a conventional impression post as well as high precision titanium scan body, unified in one single product. The patented instrument-free handling technology helps to save time and with the ability for angulated loosening, it provides easier access to limited interocclusal spaces. The handle can be used for further extension and with one screw two lengths are covered.

With the improved design, there is no risk of jamming and no control x-ray will be necessary. The retention will be significantly increased, also for the soft tissue impression, and helps to achieve high aesthetic results. The TRI 3D-Touch Impression includes the consistent and proven TRI soft tissue concept and is available for the bone- and tissue-level implant lines.

The new TRI Digital Analog is suitable for both digital and conventional production of master models.

Digital analog

TRI has also recognized the increasing importance of 3D-printing and launches an improved version of the TRI Digital Analog, which can be used for digital and conventional production of the master model. Special features allow a click-retention in the 3D-printed master model, and the analog can be additionally fixed in the model with a basal screw for maximum predictability and precision.

Digital portfolio and solutions

TRI+ Digital Solutions guarantee a universal implant open interface to leading technology partners in digital dentistry. In contrast to numerous closed digital systems, TRI helps creating more transparency and eliminating all barriers for their respective treatments. TRI+ Digital Solutions allow a wide range of indications via 3D planning, guided surgery, CAD abutments, CAD/CAM screw-retained and cement-retained restorations or modern treatments such as All-on-TRI procedures. Linked with the lean and intelligent dental implant system of TRI, treatment options from simple to complex without limits have never been easier.

The TRI+ Digital Portfolio contains the patented TRI-Bases both in an engaging and a non-engaging version, milling blanks including the proprietary TRI Friction Fit as well as Multi-Unit Ti-Bases. To meet all specific aesthetic requirements, all TRI-Bases can be customized in order to perfectly fit the anatomy and to be used with the new angulated screw driver.

The angled screw driver can be used in combination with the entire portfolio of TRI-Bases.

More information

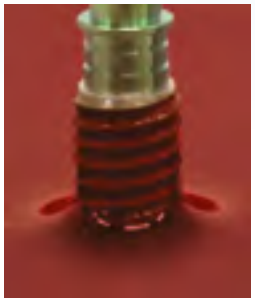
www.tri.swiss

Superhydrophilic Hiossen ETIII NH Implant

Accelerated osseointegration

There's always room for improvement – even when it comes to superior implant technology. With the introduction of the ETIII NH surface implant, Hiossen, US-based premium brand of Osstem Implant, aims to further shorten bone healing time and improve secondary attachment force.

The ETIII NH implant from Hiossen's ET System builds on the line's sand-blasted and acid-etched (SA) surface combined with a specific bioabsorbable apatite nanocoating with superhydrophilic properties, which helps ensure optimal treatment outcomes with every implant placed. Produced by Hiossen's in-house research and development team, this implant continues the company's goal of providing safe, effective and high-quality implants to dentists across the globe.

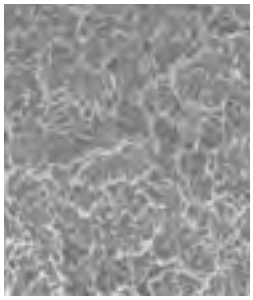


Left: NH surface (SA + nanoapatite coating).

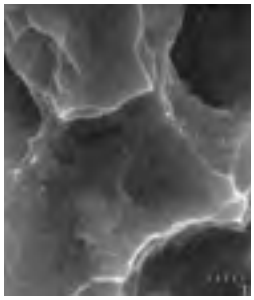
Right: Untreated surface.

Bioabsorbable nanoapatite coating

"The ETIII NH has the same effective surface as the ETIII SA implant, but it has been enhanced with a nanolayer of bioabsorbable apatite", said *Peter Lee*, Special Projects Manager for Hiossen.



Clinically proved SA surface.



Nanoapatite coating.

Enhanced osseointegration

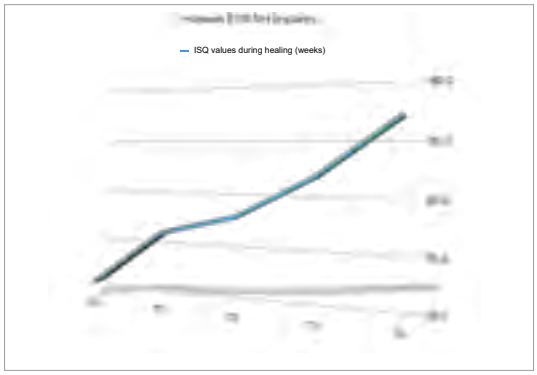
This surface treatment has been shown to speed up osseointegration because of the superhydrophilicity. "The ETIII NH's ability to immediately attract the patient's blood will in turn immediately flush the surface of the implant with the necessary proteins and bone-building factors," explained *Lee*.

Compared to a common SA surface, the surface of the ETIII NH implant shows a 12 per cent increase in platelet adhesion and cell differentiation as well as a 39 per cent increase in bone-to-implant contact.

Solution for poor bone quality

"Clinicians will be confident in placing the ET III NH even in poor bone because of the ability to quickly and securely osseointegrate into the patient", *Lee* added.

According to the conclusion of the product study published in EDI Journal 3/18 by *Dr Marco Tallarico,* "Hiossen ETIII NH implants with a new surface can be restored after four weeks of healing with highly predictable success rates, as they seem to avoid the ISQ drop during the remodeling phase. High ISQ values were found in both maxilla and mandible."



Graph showing the ISQ values during the first four weeks of healing. No stability drop was experienced. (The graphic was taken from the prospective multicentre study "Evaluation of implant stability" by Dr Marco Tallarico in EDI Journal 3/18).

More information

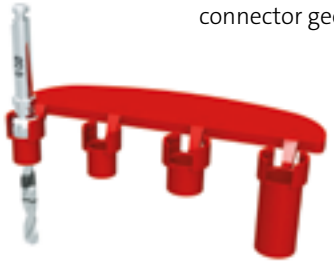
www.hiossen.com

Dentaurum Implants launches world first tioLogic Twinfit

New standards in implantology

"It's my choice" – with this slogan, Dentaurum Implants has developed an implant system that is unique world-wide – tioLogic Twinfit. Practitioners and clinicians can look forward to a patented system that has much to offer: not only safety and efficiency in handling, but also maximum flexibility during implant insertion, final restoration and in situations that change as the patient grows older. With the innovative Abutment Switch, the same implant has two connector geometries for restorations – conical and platform. Moreover, a system of depth stops offers flexibility and safety during surgical preparation.

The tioLogic Twinfit implant system covers all indications in the fields of surgery and prosthetics. Using modern FEM analyses, both the design of the implant and its thread geometry were optimized, ensuring that the flow of forces is even and gentle on the bone. The optimal grading of the implant diameters and lengths means that the appropriate implant can be used for the indication in question. The comprehensive assortment of prosthetics offers maximum flexibility where the restoration is concerned. The proven S-M-L concept and the integrated Platform Switch make the assortment for tioLogic Twinfit easy to manage: five implant diameters, five implant lengths, three series of abutments, two connector geometries – conical and platform.



Photos: Dentaurum Implants

Thanks to the innovative Abutment Switch, the implant has two connector geometries (conical/platform) for the prosthetic restoration. This is currently a unique selling point on the implant market. It offers flexibility throughout the entire life cycle of the implant – from insertion to final restoration and in situations that change as the patient grows older. Practitioners remain flexible in their decision on which abutment best suits each individual patient, both from a functional and an aesthetic point of view.

The depth stop sleeves for single use, included with every delivery, allow more flexibility and security during surgical preparation. The sleeves are designed to match the preparation protocol and serve to support the practitioner during implant insertion. They are simply pushed onto the single drills if required. Color coding indicating the diameter prevent the use of the wrong instrument. In combination with Dentaurum Implants' Advanced instruments, the implant site is prepared in a way that is gentle on the bone. At the same time, valuable autologous bone chips can be collected.

The prosthetic assortment is rounded off by the innovative 4Base system for screw-retained superstructures with angulations up to 50°. A uniform interface facilitates prosthetic restoration. This minimizes augmentative measures, thereby reducing treatment time.

The angulated screw opening is the best solution for the entire segment that is occlusally screw-retained, both for 4Base and for hybrid constructions. This guarantees prosthetic results that are both aesthetic and functional. The screw opening can be inclined at an angle of 20° to the implant axis, allowing a discreet emergence in the palatal area, particularly in the anterior region.

The patented tioLogic Twinfit implant system with all of its components is designed to suit a digital workflow. As a digital partner, the Dentaurum Group places value on process sequences that are efficient and easy to follow, using materials that have been validated – from scanning through to manufacture.

tioLogic Twinfit sets new standards in the field of implantology. The system offers solutions that are flexible, efficient and tailor-made for the patient. The programme is rounded off with a wide offer of services for the user and the patient. ■

More information
www.tioLogic-twinfit.de

mectron Glycine powder

Glycine powder has proven to be a revelation in the treatment of peri-implant diseases. Having removed the tartar from the exposed surface of the implants using specific ultrasonic tips, further detoxification with subgingival airpolishing guarantees a full recovery from the disease in eight cases out of ten.*

If the peri-implantitis is caused by bacterial plaque, the use of subgingival airpolishing by means of glycine powder with 25 µm granulometry has been found to be effective in healing the active site. For the treatment of peri-implantitis in the presence of pockets with a depth of more than 5 mm, the use of the airpolishing device with a dedicated Perio spray nozzle and periodontal subgingival tip will be the right solution: The biofilm is removed, and the surface of the implant as well as the surrounding tissues are gently cleaned, reducing the risk of tissue loss.

The periodontal subgingival tip has to be applied to a Perio spray nozzle; it doesn't emit the jet in the apical direction, but orients it sideways towards the surface of the root and the wall of the pocket, preserving the integrity of the junctional epithelium. About five seconds of spraying are necessary for each root surface to detoxify a periodontal pocket adequately (mesial, distal, vestibular and lingual surfaces). The thin tip allows proper decontamination of the sites, ensuring delicate entry into the pocket due to its specifique anatomical shape and flexibility to guarantee a minimally invasive treatment.

*Sarri S, Bontà G, Boldi M, Rossini M, Nardi G. Risultati dell'utilizzo della glicina su impianti con sondaggio. Implantologia dentale e parodontologia 2006; 14(4): 168-170.

Product
Prophylaxis powder sensitive

Indication
Implant maintenance and biofilm removal

Distribution
mectron S.P.A.
Via Loreto, 15/A
16042 Carasco (GE)
Italy
www.mectron.com

Thommen Medical Guided Surgery Kit

Thommen Medical, Swiss designer and manufacturer of a dental implant system known for extreme precision and innovative design, announces the launch of the new Thommen Medical Guided Surgery Kit. Fully guided placement with Thommen Medical implants enables the practitioner to efficiently achieve his planned digital restoration in just a few steps and to benefit from improved treatment confidence and patient comfort. The guided system will simplify the treatment process for the entire dental team. Highest precision is guaranteed through the principle of passive guidance: Each instrument is guided precisely through the combination of integrated guidance and the proven VectorDrill geometry.

One drilling sleeve, perfectly matched to all cutting instruments, provides a cylindrical guide area and mechanical depth control. This integrated guidance is significantly easier in comparison to indirectly guided systems (for example tray systems). Additionally, the same surgical cassette is utilized for everything: surgical treatment, processing/sterilization and storage.

Product
Guided surgery system

Indication
Fully guided implant placement

Distribution
Thommen Medical AG
Neckarsulmstrasse 28
2540 Grenchen
Switzerland
www.thommenmedical.com

Calendar of Events

	Event	Location	Date	Details/Registration
2/2019	**23rd UAE International Dental Conference & Arab Dental Exhibition**	Dubai VAE	5–7 February 2019	Index Conferences& Exhibitions www.aeedc.com
	Chicago Dental Society Midwinter Meeting	Chicago USA	21–23 February 2019	Chicago Dental Society (CDS) www.cds.org
3/2019	**14th BDIZ EDI Expert Symposium**	Cologne Germany	3 March 2019	BDIZ EDI www.bdizedi.org
	IDS 2019 38th International Dental Show	Cologne Germany	12–16 March 2019	Koelnmesse GmbH www.ids-cologne.de
	ITI Congress Iberia	Porto Portugal	22–23 March 2019	International Team for Implantology www.iti.org/congressiberia/
4/2019	**Oral Reconstruction Symposium France**	Paris France	4–5 April 2019	Oral Reconstruction Foundation orfoundation.org/education/national-symposia/
	International Osteology Symposium	Barcelona Spain	25–27 April 2019	Osteology Foundation www.osteology.org
5/2019 6/2019	**Osstem World Meeting 2019**	Tokyo Japan	11–12 May 2019	Osstem Implant www.osstem.de
	WID – Vienna International Dental Exhibition	Vienna Austria	17–18 May 2019	admicos.Congress Incentive GmbH www.wid.dental
	12th International Implant Symposium	Corte Corsica/France	31 May – 1 June 2019	University of Corsica – Pascal Paoli www.dentalimplant-elearning.com
6/2019	**Nobel Biocare Global Symposium**	Las Vegas USA	27–29 June 2019	Nobel Biocare www.nobelbiocare.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

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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.
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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.
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[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)

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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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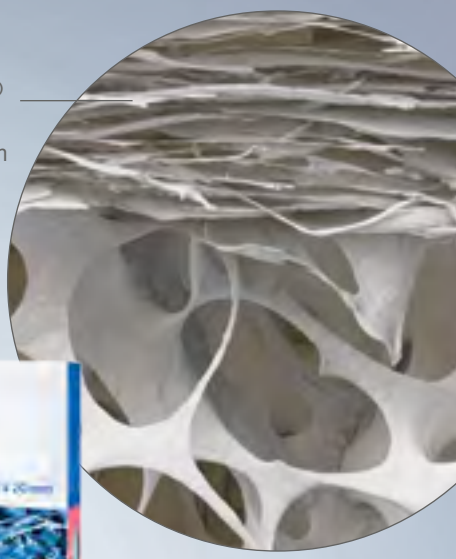

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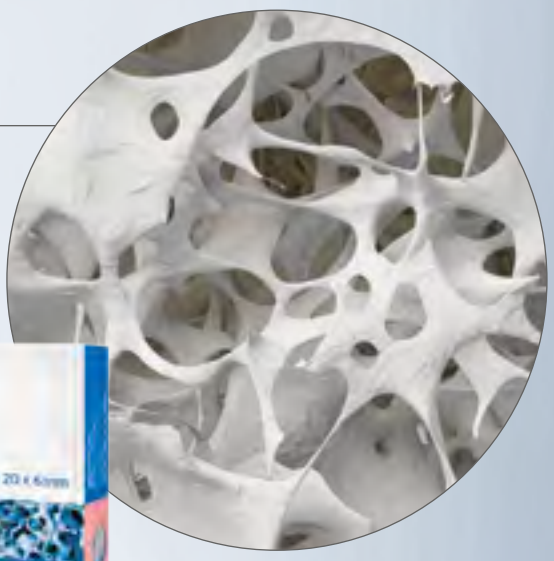

1 Nevins M, et al. Int J Periodontics Restorative Dent. 2011 Jul–Aug;31(4):367–73.
2 McGuire MK, et al., J Periodontol. 2014 Oct;85(10):1333–41.
3 Schmitt CM.et al. J Periodontol. 2013 Jul;84(7):914–23
4 European Patent Specification – EP 3 055 000 B1.
5 Data on file. Geistlich Pharma AG, Wolhusen, Switzerland.

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